THE ENCYCLOPEDIA OF ELDER CARE

The Comprehensive Resource on Geriatric and Social Care

SECOND EDITION

Elizabeth A. Capezuti
Eugenia L. Siegler
Mathy D. Mezey
Editors

THE ENCYCLOPEDIA OF ELDER CARE

THE COMPREHENSIVE RESOURCE ON GERIATRIC AND SOCIAL CARE

SECOND EDITION

ELIZABETH A. CAPEZUTI, PHD, RN, FAAN
EUGENIA L. SIEGLER, MD, FACP
MATHY D. MEZEY, EDD, RN, FAAN

EDITORS

JOAN DUNBAR, MBA, MSW

MANAGING EDITOR

REGINA M. WON, BSN

ASSISTANT MANAGING EDITOR

SPRINGER PUBLISHING COMPANY
NEW YORK

THE ENCYCLOPEDIA OF ELDER CARE

THE COMPREHENSIVE RESOURCE ON GERIATRIC AND SOCIAL CARE

SECOND EDITION

Springer Publishing Company, LLC.
11 West 42nd Street
New York, NY 10036
www.springerpub.com

Acquisitions Editor: Sally J. Barhydt
Managing Editor: Mary Ann McLaughlin
Cover Designer: Joanne E. Honigman
Production Editor: Tenea Johnson
Composition: Aptara, Inc.

07 08 09 10/ 5 4 3 2 1

Library of Congress Cataloging-in-Publication Data

The encyclopedia of elder care : the comprehensive resource on geriatric and social care / Elizabeth A. Capezuti, Eugenia L. Siegler, Mathy D. Mezey, editors ; Joan Dunbar, managing editor.
p. ; cm.
Includes bibliographical references and index.
ISBN 978–0–8261–0259–1 (hardback)
1. Geriatric nursing—Encyclopedias. 2. Older people—Care—Encyclopedias. 3. Older people—Medical care—Encyclopedias.
I. Capezuti, Liz.
[DNLM: 1. Health Services for the Aged—Encyclopedias—English. 2. Geriatric Nursing—Encyclopedias—English.
3. Geriatrics—Encyclopedias—English. WT 13 E56 2007]

RC954.E53 2007
362.1′9897003–dc22

2007022857

Printed in the United States of America by Maple-Vail.

CONTENTS

ABOUT THE EDITORS

Elizabeth A. Capezuti, PhD, RN, FAAN, is an Associate Professor at New York University College of Nursing. She also serves as Co-director for the John A. Hartford Foundation Institute for Geriatric Nursing at New York University, where she directs the Nurses Improving the Care of Healthsystem Elders (NICHE) and the Geriatric Nursing Research Scholars programs. Dr. Capezuti received her doctoral degree in nursing from the University of Pennsylvania in 1995 and is a nationally certified Geriatric Nurse Practitioner. She also was on the faculty of the University of Pennsylvania's School of Nursing from 1984 through 2000, where she received the 1995 Provost's Award for Distinguished Teaching. From 2000 to 2003, she held the Independence Foundation Wesley Woods Chair in Gerontologic Nursing at Emory University. Dr. Capezuti's program of research focuses on the development and testing of interventions aimed at improving care of frail older adults. Findings from her research have been used to draft both state legislation and federal regulations related to nursing home care. She serves on several national boards and has been a consultant to the Hospital Bed Safety Workgroup of the U.S. Food and Drug Administration and the Center for Medicare and Medicaid Services. Dr. Capezuti has published extensively in the areas of fall prevention, restraint and side-rail elimination, elder mistreatment, and legal liability issues. She is a Fellow of the American Academy of Nursing, the Gerontological Society of America, the American Association of Nurse Practitioners, and the New York Academy of Medicine.

Eugenia L. Siegler, MD, FACP, is Professor of Clinical Medicine at the Weill Cornell Medical College and the Medical Director of the Geriatrics Inpatient Service at the Weill/Cornell Campus of the New York Presbyterian Hospital, and serves on the MEDCO Medicare Part D P&T Committee. She is a graduate of Johns Hopkins University School of Medicine. She completed an Internal Medicine Residency at Bellevue and Tisch Hospitals and a Fellowship in Geriatrics and General Internal Medicine at the University of Pennsylvania. She has served as a member of the faculty at the University of Pennsylvania and as Chief of Geriatrics at Brooklyn Hospital Center.

Mathy D. Mezey, EdD, RN, FAAN, is Professor and Director of the John A. Hartford Foundation Institute for Geriatric Nursing at New York University College of Nursing. Dr. Mezey's distinguished career has focused on raising the standards of nurses caring for older adults and ensuring that people age in comfort and with dignity. Dr. Mezey received her undergraduate and graduate degrees in nursing from Columbia University. In New York City, she worked for The Visiting Nurse Service of New York and taught at Lehman College, CUNY. From 1981 to 1991, Dr. Mezey was a Professor at the University of Pennsylvania, where she directed the geriatric nurse practitioner program and the Robert Wood Johnson Foundation Teaching Nursing Home Program. Since 1996, Dr. Mezey has directed the John A. Hartford Foundation Institute for Geriatric Nursing in the NYU College of Nursing. In this position, she oversees a national initiative to improve geriatric nursing. Dr. Mezey has a long-standing interest in bioethics research and education. Her research examines the decision-making capacity of older adults to execute a health care proxy and the factors influencing the transfer of nursing residents to hospitals at the end of life. Dr. Mezey is the author of 11 books and more than 100 chapters and articles. Among her many awards, Dr. Mezey has twice received the Geriatric Book-of-the-Year Award by the American Journal of Nursing. She is a Fellow of the American Academy of Nursing, the Gerontological Society of America, and the New York Academy of Medicine.

MANAGING EDITOR

Joan Dunbar, MBA, MSW, was, until 2005, Borough Coordinator for the Consortium of New York Geriatric Education Centers, where she planned, implemented, and coordinated all aspects of this continuing education program encompassing all of New York City. In 1991, she became coordinator of the Commonwealth Restraint Minimization Project, a national clinical demonstration and research project. She published and presented extensively on restraint-free care in nursing homes, created guidelines for clinical practice, and testified before the U.S. Joint Congressional Committee on Aging. She was a project manager and trainer at Brookdale Center on Aging when she moved to New York in 1985. Prior to that, she was a geriatric social worker in Wisconsin. Ms. Dunbar received a Master of Social Work and a Master of Business Administration in Management from the University of Wisconsin. She is a Fellow of the New York Academy of Medicine and the Brookdale Center on Aging, a member of Alpha Delta and the Gerontological Society of America, and she served on the Social Work Advisory Committee of the Brookdale Center on Aging of Hunter College.

ASSISTANT MANAGING EDITOR

Regina M. Won BSN, is a staff nurse at Mount Sinai Medical Center.

PREFACE

The Encyclopedia of Elder Care is a reference designed to encapsulate all aspects of care for an aging population: a comprehensive, multidisciplinary compilation of topics that reflects the breadth and depth of issues of concern to those who care for older individuals—from individual to society, from patient to professional, from symptom to treatment.

This second edition is not written with one perspective only or designed for any specific discipline. We anticipate that our readers will be professionals and students from a variety of health professions including nursing, medicine, psychology, and social work, as well as gerontologists and students of aging who seek succinct answers to clinical questions. We expect that our readers will have questions that arise from both work and family needs.

Because the goal of this encyclopedia is to introduce readers from a variety of disciplines to the broad range of topics and perspectives of elder care, the editors and contributors offer concise and timely introductions rather than in-depth coverage. Select literature and Internet sources encourage readers to delve further into topics of interest. We have designed *The Encyclopedia of Elder Care* to be useful for both quick reference and leisurely browsing, and we hope that our readers find that the indexing and cross-referencing encourage them to explore areas they might not otherwise have contemplated.

Features of the second edition include a complete revision of entries with thoroughly updated reference lists, a modified topic list that reflects current research in geriatrics, and more extensive use of on-line resources. Thematically, the entries in this encyclopedia reflect elder-care concerns in four areas: society, community, caregiving, and the individual. Clinical topics provide broad overviews of diagnosis, treatment, and disease management.

Health care has become even more complex and society more complicated in the years since the publication of the first edition. We have revised and updated *The Encyclopedia of Elder Care* to share these advances and challenges that characterize the wonderful work of caring for older individuals. We hope our readers find the encyclopedia a useful tool for their professional and personal lives.

Elizabeth A. Capezuti

Eugenia L. Siegler

Mathy D. Mezey

CONTRIBUTORS

Qamrun Abedin, MD
Formerly, Department of Geriatric Psychiatry
Montefiore Medical Center
Bronx, NY

Robert C. Abrams, MD
Department of Psychiatry
Weill Cornell Medical College
New York, NY

Ronald D. Adelman, MD
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Elaine J. Amella, PhD, APRN, BC, FAAN
College of Nursing
Medical University of South Carolina
Charleston, SC

Harriet Udin Aronow, PhD
College of Business and Public Management
University of LaVerne
La Verne, CA

Carolyn Auerhahn, EdD, APRN, BC, NP-C
College of Nursing
New York University
New York, NY

Carol D. Austin, PhD
Faculty of Social Work
University of Calgary
Calgary, Alberta, Canada

Mary Guerriero Austrom, PhD
Department of Psychiatry
University of Indiana School of Medicine
Indianapolis, IN

Elizabeth A. Ayello, PhD, RN, APRN, BC, CWOCN, FAPWCA, FAAN
School of Nursing
Excelsior College
New York, NY

Ronet Bachman, PhD
Department of Sociology and Criminal Justice
University of Delaware
Newark, DE

Marjorie E. Baker, PhD
Department of Social Work
Wright State University
Dayton, OH

Rosemary Bakker, MS, ASID
Gerontologic Design in Medicine
Weill Cornell Medical College
New York, NY

Lodovico Balducci, MD
H. Lee Moffitt Cancer Center and Research Institute
University of South Florida
Tampa, FL

Susan C. Ball, MD, MPH
The Center for Special Studies
New York Presbyterian Hospital
New York, NY

Virginia W. Barrett, RN, DrPH
Stroud Center
Columbia University
New York, NY

Karen Bassuk, CSW
Visiting Nurse Service of New York
New York, NY

Judith Beizer, PharmD, CGP, FASCP
College of Pharmacy and Allied Health Professions
St. John's University
Jamaica, NY

Susan I. Bernatz, PhD
Los Angeles County Elder Abuse Forensic Center
LAC/USC Medical Center
Los Angeles, CA

David E. Biegel, PhD, ACSW
Mandel School of Applied Social Sciences
Case Western Reserve University
Cleveland, OH

Joyce M. Black, PhD, RN
College of Nursing
University of Nebraska Medical Center
Omaha, NE

Stephen B. Black, MD
Department of Plastic Surgery
University of Nebraska Medical Center
Omaha, NE

Shawn Bloom, MS
National PACE Association
Alexandria, VA

Jeffrey Blustein, PhD
Department of Epidemiology and Social Medicine
Albert Einstein College of Medicine
Bronx, NY

Marie Boltz, MSN, APRN-BC, GNP
College of Nursing
New York University
New York, NY

Robert A. Bonomo, MD
Veterans Affairs Medical Center
Case Western Reserve University
Cleveland, OH

Patricia Booth, MS, RD, FADA
University of California San Francisco Medical Center
San Francisco, CA

Enid A. Borden, MA
Meals on Wheels Association of America
Alexandria, VA

Mathias Bostrom, MD
Department of Orthopedic Surgery
Hospital for Special Surgery
New York, NY

Charles Boult, MD, MPH, MBA
Bloomberg School of Public Health
Johns Hopkins University
Baltimore, MD

Kathryn H. Bowles, PhD, RN, FAAN
School of Nursing
University of Pennsylvania
Philadelphia, PA

Lisa L. Boyle, MD
Department of Psychiatry
University of Rochester Medical School
Rochester, NY

Kathy Pierce Bradley, EdD, OTR/L, FAOTA
School of Allied Health Sciences
Medical College of Georgia
Augusta, GA

Risa Breckman, MSW
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Abraham A. Brody, RN, MS
School of Nursing
University of San Francisco
San Francisco, CA

Chaim E. Bromberg, PhD
Comprehensive Psychological Services
Harrison, NY

Sue Brown, DN, RN, MHlthSc
School of Nursing Sciences
James Cook University
Smithfield, Queensland, Australia

Colette V. Browne, DrPH
School of Social Work
University of Hawaii
Honolulu, HI

Barbara L. Brush, PhD, RN, FAAN
School of Nursing
University of Michigan
Ann Arbor, MI

Cary Buckner, MD
Department of Neurology
Methodist Hospital
Brooklyn, NY

Lynn Bunch, MD
Brookdale Department of Geriatrics and Adult Development
Mount Sinai School of Medicine
New York, NY

Lisette Bunting-Perry, MScN, RN
Hartford Center for Geriatric Nursing Excellence
University of Pennsylvania School of Nursing
Philadelphia, PA

Sarah Greene Burger, RN, MPH, FAAN
Coalition of Geriatric Nursing Organizations
The John A. Hartford Foundation Institute for Geriatric Nursing
Washington, DC

Gary Burtless, PhD
The Brookings Institution
Washington, DC

Robert N. Butler, MD
International Longevity Center USA, Ltd.
New York, NY

John G. Cagle, MSW
College of Social Work
Florida State University
Tallahassee, FL

Margaret P. Calkins, PhD
IDEAS, Inc.
Kirtland, OH

Tanya L. Carter, OD
College of Optometry
State University of New York
New York, NY

Barbara Carty, RN, EdD, FAAN
College of Nursing
New York University
New York, NY

Sandra Chalmers, MPH
Division of Health Care Policy and Research
University of Colorado Denver Health Sciences Center
Aurora, CO

Eileen R. Chasens, DSN, RN
School of Nursing
University of Pittsburgh
Pittsburgh, PA

Deborah Chestnutt, MSN, RN
School of Nursing
Duke University
Durham, NC

Mary Jane Ciccarello, JD
Henry & Ciccarello, LLC
Salt Lake City, UT

Kimberlee A. Clark, BA
Center for Gerontologic Nursing Science
University of Pennsylvania School of Nursing
Philadelphia, PA

‘Lissa Clark, RN, MSN, CNE
College of Nursing/Adult Health &
Illness Department
University of Nebraska Medical Center
Elkhorn, NE

Carolyn K. Clevenger, MSN, APRN-BC
Nell Hodgson Woodruff School of Nursing
Emory University
Atlanta, GA

Eric A. Coleman, MD, MPH
Division of Health Care Policy & Research
University of Colorado Denver Health
Sciences Center
Aurora, CO

Yolonda R. Colemon, MD
Department of Psychiatry and Behavioral Sciences
Albert Einstein College of Medicine
Bronx, NY

Yeates Conwell, MD
Department of Psychiatry
University of Rochester Medical Center
Rochester, NY

Susan G. Cooley, PhD
West Palm Beach VA Medical Center
West Palm Beach, FL

Fiona Crawford, PhD
Roskamp Institute
University of South Florida
Tampa, FL

Sara J. Czaja, PhD
Psychiatry and Behavioral Sciences
University of Miami School of Medicine
Miami, FL

JoAnn Damron-Rodriguez, PhD, LCSW
School of Public Affairs, Department
of Social Welfare
UCLA
Los Angeles, CA

James W. Davis, Jr., MD
Division of Geriatrics
David Geffen School of Medicine at UCLA
Los Angeles, CA

Linda Lindsey Davis, PhD, RN
School of Nursing
Duke University
Durham, NC

Sabina De Geest, RN, PhD
Institute for Nursing Science
University of Basel
Basel, Switzerland

Dirk De Ridder, MD, PhD, FEBG
Department of Urology
University Hospitals of Leuven
Leuven, Belgium

Eddy Dejaeger, MD, PhD
Department of Geriatrics
University of Leuven
Leuven, Belgium

Richard D. Della Penna, MD
Continuing Care Services
Kaiser Permanente San Diego
San Diego, CA

Yuliya Dementyeva, MD
Department of Psychiatry
Montefiore Medical Center
Bronx, NY

Shawkat Dhanani, MD
VA Medical Center of West Los Angeles
David Geffen School of Medicine at UCLA
Los Angeles, CA

Gretchen J. Diefenbach, PhD
Anxiety Disorders Center
Institute of Living
Hartford, CT

Rose Ann DiMaria-Ghalili, PhD, RN, CNSN
School of Nursing
West Virginia University
Charleston, WV

Mitchell W. Dul, OD
State University of New York College of Optometry
New York, NY

Laura B. Dunn, MD
Department of Psychiatry
University of California at San Diego
La Jolla, CA

Mary (Kelly) Dunn, PhD, APRN, BC
School of Nursing
University of Texas Health Science Center
San Antonio, TX

Timothy Dutta, MD
Department of Medicine
Weill Cornell Medical College
New York, NY

Barbara J. Edlund, PhD, RN, CS, ANP-BC
College of Nursing
Medical University of South Carolina
Charleston, SC

David J. Ekerdt, PhD
Department of Sociology
University of Kansas
Lawrence, KS

Amanda Floetke Elliott, PhD, ARNP
Center for Mental Health and Aging
University of Alabama
Tuscaloosa, AL

Ronald L. Ettinger, BDS, MDS, DDSc
Dows Institute of Dental Research
University of Iowa College of Dentistry
Iowa City, IA

Gerald L. Euster, DSW
College of Social Work
University of South Carolina
Columbia, SC

Lois K. Evans, DNSc, RN, FAAN
School of Nursing
University of Pennsylvania
Philadelphia, PA

Temperance Evans, PsyD
Los Angeles County Elder Abuse Forensic Center
LAC/USC Medical Center
Los Angeles, CA

Maryjane Farr, MD, FACC
Division of Cardiology
Weill Cornell Medical College
New York, NY

Eleanor E. Faye, MD
Lighthouse International
New York, NY

Naomi Feil, MS, ACSW
Validation Training Institute
Cleveland, OH

Lynn Friss Feinberg, MSW
National Center on Caregiving
Family Caregiver Alliance
San Francisco, CA

Alfred G. Feliu, Esq.
Vandenberg & Feliu, LLP
New York, NY

Helen Fernandez, MD, MPH
Brookdale Department of Geriatrics and Adult Development
Mount Sinai School of Medicine
New York, NY

Donna M. Fick, PhD, APRN-BC, FGSA
School of Nursing
Pennsylvania State University
University Park, PA

Gerda G. Fillenbaum, PhD
Center for the Study of Aging and Human Development
Duke University Medical Center
Durham, NC

Christine Fitzgerald, RRT, MHS, PhD
School of Health Sciences
Quinnipiac College
Hamden, CT

Mary Fitzgerald, RN, DN, Cert Ed, MN, PhD, FRCNA
School of Nursing Sciences
James Cook University
Cairns, Queensland, Australia

Sheila FitzSimons-Scheurer, RN, MA, GNP, CS
Formerly, Department of Medicine
Weill Cornell Medical College
New York, NY

Mary Ann Forciea, MD
Division of Geriatric Medicine
University of Pennsylvania School of Medicine
Philadelphia, PA

Marquis Foreman, RN, PhD, FAAN
College of Nursing
University of Illinois at Chicago College of Nursing
Chicago, IL

Barbara Frank, MPA
B&F Consulting
Warren, RI

Michael Freedman, MD
Department of Medicine
NYU Medical Center
New York, NY

James F. Fries, MD
Department of Immunology and Rheumatology
Stanford University School of Medicine
Palo Alto, CA

Terry T. Fulmer, PhD, RN, FAAN
College of Nursing
New York University
New York, NY

Elaine M. Gallagher, PhD
School of Nursing
University of Victoria
Victoria, British Columbia, Canada

Sandra B. Ganz, PT, DSc, GCS
Department of Rehabilitation
Hospital for Special Surgery
New York, NY

Linda K. George, PhD
Center for the Study of Aging and Human Development
Duke University Medical Center
Durham, NC

Kimberly S. Glassman, PhD, RN
New York University Hospital Center
New York, NY

Ann Goeleven, MSc, SLP
Department of ENT–Head and Neck Surgery
University Hospitals of Leuven
Leuven, Belgium

Cara Goldstein, MSW
National Center on Caregiving
Family Caregiver Alliance
San Francisco, CA

James Golomb, MD
Department of Neurology
New York University School of Medicine
New York, NY

Susan Goodman, MD
Department of Rheumatology
Hospital for Special Surgery
New York, NY

Elaine S. Gould, MSW
College of Nursing
New York University
New York, NY

Alexis Granite, MD
Department of Dermatology
New York Weill Medical Center
New York, NY

Michele G. Greene, Dr PH
Department of Health and Nutrition Sciences
Brooklyn College
Brooklyn, NY

Roberta R. Greene, PhD
School of Social Work
University of Texas
Austin, TX

Suzanne Orr Gresle, MA, MS, CCC-SLP
College of Nursing
Medical University of South Carolina
Charleston, SC

Margaret M. Grisius, MD
National Institute of Dental and
Craniofacial Research
National Institutes for Health
Bethesda, MD

Barry J. Gurland, MD, FRC Physicians,
FRC Psychiatry
Stroud Center
Columbia University
New York, NY

Ramez Habib, MD
Department of Otolaryngology
SUNY Downstate Medical Center
Brooklyn, NY

Barbara L. Halliday, MSN, RN, APRN-BC
Clinical Nurse Specialist
MetroHealth Medical Center
Cleveland, OH

Amret T. Hawfield, MD
Division of Nephrology
New York Presbyterian Hospital
New York, NY

Arthur E. Helfand, DPM
Formerly, Temple University School
of Podiatric Medicine
Philadelphia, PA

Tarek Helmy, MD, FACC
Department of Cardiology
University of Cincinnati College of Medicine
Cincinnati, OH

Claire Henchcliffe, MD
Parkinson's Institute
Department of Neurology
Weill Cornell Medical College
New York, NY

Jon Hendricks, PhD
University Honors College
Oregon State University
Corvallis, OR

Hugh C. Hendrie, MB, ChB, DSc
Department of Psychiatry
Indiana University School of Medicine
Indianapolis, IN

Alice Herb, JD, LLM
SUNY Health Science Center
Brooklyn, NY

Tiffany Herlands, PsyD
Department of Neuropsychology
Montefiore Medical Center
Bronx, NY

Immanuel K. Ho, MD
Department of Gastroenterology
Crozer–Chester Hospital
Upland, PA

Helen M. Hoenig, MD, MPH
Physical Medicine and Rehabilitation
Duke University Medical Center
Durham VA Medical Center, GRECC
Durham, NC

David R. Hoffman, JD
David Hoffman & Associates
Philadelphia, PA

Beth L. G. Hollander, AB
Department of Psychology
Hofstra University
Hempstead, NY

Lisa A. Honkanen, MD
Formerly, Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Ann Horgas, RN, PhD, FGSA, FAAN
College of Nursing
University of Florida
Gainesville, FL

Judith L. Howe, PhD
GRECC
Bronx VAMC
Bronx, NY

Kathryn Hyer, PhD, RN
Training Academy on Aging
University of South Florida
Tampa, FL

Ellen Idler, PhD
Department of Psychology
Institute for Health, Health Care Policy and Aging Research
New Brunswick, NJ

Naoki Ikegami, MD, MA
Department of Health Policy and Management
School of Medicine, Keio University
Tokyo, Japan

Margaret B. Ingraham, MA
Meals on Wheels Association of America
Alexandria, VA

Sharon K. Inouye, MD, MPH
Department of Medicine
Harvard Medical School
Boston, MA

Yakov Iofel, MD
Department of Geriatric Medicine
North Shore University Hospital
Manhasset, NY

Richard S. Isaacson, MD
Departments of Medical Education, Internal Medicine and Neurology
University of Miami–Miller School of Medicine
Miami Beach, FL

Nancy S. Jecker, PhD
Department of Medical History and Ethics
University of Washington School of Medicine
Seattle, WA

Julie E. Johnson, PhD, RN, FAAN
College of Nursing
New Mexico State University
Las Cruces, NM

Rebecca A. Johnson, PhD, RN
Sinclair School of Nursing
University of Missouri–Columbia
Columbia, MO

Theodore Johnson, II, MD, MPH, CMD
Birmingham /Atlanta VA GRECC
Atlanta VA Medical Center
Decatur, GA

Thomas E. Johnson, PhD
Department of Integrative Physiology
Institute of Behavioral Genetics
University of Colorado
Boulder, CO

Erica C. Jones, MD
Department of Medicine
Weill Cornell Medical College
New York, NY

Marshall B. Kapp, MPH, JD
Southern Illinois University School of Law
Carbondale, IL

Milla Karev, MD
Alliance Primary Care, Senior Care
Cincinnati, OH

Arun S. Karlamangla, MD
Department of Geriatrics
UCLA/Sepulveda VA Medical Center
UCLA Med-GRECC, SFVP, CA

Juhayna Kassem, MD
Weill Cornell Pulmonary Associates
Weill Cornell Medical College
New York, NY

Jeanie Kayser-Jones, RN, PhD, FAAN
School of Nursing
University of California San Francisco
San Francisco, CA

Michael Keenan, PhD
Stern School of Business
New York University
New York, NY

David Keepnews, PhD, JD, RN
School of Nursing
Adelphi University
Garden City, NY

Gary J. Kennedy, MD
Division of Geriatric Psychiatry
Montefiore Medical Center
Bronx, NY

Akbar H. Khan, MD
Department of Medicine
Division of Cardiology
Atlanta, GA

Daniel S. Kim, MD
VA San Diego Healthcare System
Department of Psychiatry
University of California at San Diego
San Diego, CA

Alan Kluger, PhD
Department of Psychology
Lehman College
Bronx, NY

Rosalind Kopfstein, DSW
Consultant
Redding, CT

B. Josea Kramer, PhD
Sepulveda Geriatric Research Education Clinical Center
Greater Los Angeles VA Healthcare System
Sepulveda, CA

Marc Kramer, PhD
Department of Audiology and Otolaryngology
Weill Cornell Medical College
New York, NY

Reto W. Kressig, M.D.
Acute Geriatrics & Memory Clinic
Basel University Hospital
Basel, Switzerland

John A. Krout, PhD
Gerontology Institute
Ithaca College
Ithaca, NY

Lenore H. Kurlowicz, PhD, RN, CS, FAAN
School of Nursing
University of Pennsylvania
Philadelphia, PA

Mark Lachs, MD, MPH
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Melinda S. Lantz, MD
Department of Geriatric Psychiatry
Beth Israel Medical Center
New York, NY

Felissa R. Lashley, RN, PhD, ACRN, FAAN, FACNG
College of Nursing
Rutgers University
Newark, NJ

William T. Lawson, JD
Law Offices of William T. Lawson, III
Philadelphia, PA

Haejung Lee
School of Nursing
Pusan National University
Pusan, South Korea

Juhee Lee, PhD, RN
College of Nursing
Yonsei University
Seoul, South Korea

Taryn Yeon Sil Lee, MD
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Amanda J. Lehning, MSS
School of Social Welfare
University of California–Berkeley
Berkeley, CA

Jillian Leitao, BA
National PACE Association
Washington, DC

Helen-Maria Lekas, PhD
Mailman School of Public Health
Columbia University
New York, NY

Kristin Lemko RN, BSN
College of Nursing
New York University,
New York, NY

Gary L. LeRoy, MD
Department of Family Medicine
Wright State University
Dayton, OH

Felix W. Leung, MD
Division of Gastroenterology
Sepulveda VA Medical Center
Los Angeles, CA

Steven Levenson, MD
Genesis ElderCare Network
Baltimore, MD

Amiel Levin, MD
Department of Internal Medicine
University of Miami, Mount Sinai Medical Center of Florida
Miami, FL

Donna Lewis, MSN, RN
Birmingham/Atlanta VA GRECC
Atlanta VA Medical Center
Atlanta, GA

Phoebe S. Liebig, PhD
Ethel Percy Andrus Gerontology Center
University of Southern California
Los Angeles, CA

Robert D. Lindeman, MD
Formerly, School of Medicine
University of New Mexico
Albuquerque, NM

Jo E. Linder, MD
Emergency Department
Maine Medical Center
Portland, ME

Adrianne Dill Linton, PhD, RN
Department of Chronic Nursing Care
UTHSCSA School of Nursing
San Antonio, TX

Veronica LoFaso, MD
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

William C. Logan, Jr., MD
Duke University Medical Center and
Durham VA Medical Center
Durham, NC

Jeffrey M. Lyness, MD
Department of Psychiatry
University of Rochester Medical Center
Rochester, NY

Meridean L. Maas, PhD, RN, FAAN
College of Nursing
University of Iowa
Iowa City, IA

Chris MacKnight, MD, MSc, FRCPC
Department of Medicine
Dalhousie University
Halifax, Nova Scotia, Canada

George L. Maddox, PhD
Long Term Care Resources Program
Center for the Study of Aging
Durham, NC

Richard J. Madonna, OD, MA, FAAO
College of Optometry
State University of New York
New York, NY

Kevin J. Mahoney, PhD
Cash and Counseling National Program Director
Boston College Graduate School of Social Work
Chestnut Hill, MA

Karen S. Martin, RN, MSN, FAAN
Martin Associates
Omaha, NE

Genevieve Martinez-Garcia, MPH
University of Maryland Center on Aging
College Park, MD

Marianne Matzo, PhD, APRN, BC, FAAN
Sooner Palliative Care Institute
College of Nursing
University of Oklahoma
Oklahoma City, OK

Robert McAlister, PhD, MHE
Department of Occupational Therapy, Allied
Health Sciences
Medical College of Georgia
Augusta, GA

Jane A. McDowell, GNP, CRNP
Mount Nittany Medical Center
State College, PA

Elizabeth F. McGann, DNSc, RN
Department of Nursing
Quinnipiac University
Hamden, CT

Thomas W. Meeks, MD
Department of Psychiatry
University of California at San Diego
La Jolla, CA

Elizabeth M. Miller, MSN, MBA, ARNP
Evercare Gulf Coast
Tampa, FL

Patricia A. Miller, EdD, OTR, FAOTA
Programs in Occupational Therapy
Columbia University
New York, NY

Lorraine C. Mion, PhD, RN, FAAN
Nursing Research and Geriatric Nursing
MetroHealth Medical Center
Cleveland, OH

Ethel L. Mitty, RN, EdD
College of Nursing
New York University
New York, NY

Roger D. Mitty, MD
Department of Gastroenterology
School of Medicine
Tufts University
Brighton, MA

Niall Monaghan, BA
Formerly, Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Lynne Morishita, RNC, GNP, MSN
Consultant in Geriatric Health Care
Minneapolis, MN

R. Sean Morrison, MD
Brookdale Department of Geriatrics and Adult Development
Mount Sinai School of Medicine
New York, NY

Michael D. Murray, Pharm D, MPH
Division of Pharmaceutical Outcomes and Policy
University of North Carolina at Chapel Hill
Chapel Hill, NC

Carol M. Musil, PhD, RN, FAAN
Bolton School of Nursing
Case Western Reserve University
Cleveland, OH

Matthias J. Naleppa, PhD
School of Social Work
Virginia Commonwealth University
Richmond, VA

Ganesh C. Natarajan, MD
Boston University Medical Center
Boston, MA

Robert A. Neimeyer, PhD
Department of Psychology
University of Memphis
Memphis, TN

Catherine O'Keefe, MED, CTRS
Department of Health, Physical Education and Leisure Studies
University of South Alabama
Mobile, AL

David Oliver, MB, BCh, FRCP
Institute of Health Sciences
University of Reading
Reading, Berkshire, England

Joanne Marlatt Otto, MSW
National Adult Protective Services Association
Boulder, CO

Joseph G. Ouslander, MD
School of Medicine
Emory University
Atlanta, GA

Robert M. Palmer, MD, MPH
Division of Medicine
Cleveland Clinic
Cleveland, OH

Maria Pappas, DrPH, RN-C
Institute of Technology
State University of New York
Utica, NY

Gregory J. Paveza, MSW, PhD, ACSW
School of Social Work
University of South Florida
Lakeland, FL

Maria P. Pavlou, MD
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Alan Pearson, RN, PhD, FRCNA, FRCN
Joanna Briggs Institute
Royal Adelaide Hospital
Adelaide, South Australia, Australia

Melinda Perez-Porter, JD
The Brookdale Foundation
New York, NY

Noralyn Davel Pickens, PhD, OTR
Occupational Therapy Department
Texas Women's University
Garland, TX

Sandra J. Fulton Picot, PhD, RN, FAAN
School of Nursing
University of Maryland
Baltimore, MD

Margaret Polaneczky, MD, FACOG
Department of Obstetrics and Gynecology
Weill Cornell Medical College
New York, NY

Rosemary C. Polomano, PhD, RN, FAAN
School of Nursing
University of Pennsylvania
Philadelphia, PA

Linda Farber Post, JD, BSN, MA
Bioethicist and Clinical Ethics Consultant
Saddle River, NJ

Christopher M. Powers, PhD
Department Biokinesiology and Physical Therapy
University of Southern California
Los Angeles, CA

Nicholas G. Procter, RN, PhD, MANZCMHN
School of Nursing and Midwifery
University of South Australia
Adelaide, South Australia, Australia

Rolanda Pyle, MSW, MA
The Brookdale Foundation
New York, NY

Jean K. Quam, PhD, LICSW
School of Social Work
University of Minnesota
St. Paul, MN

Lauretta Quinn, PhD, RN
College of Nursing
University of Illinois at Chicago
Chicago, IL

Barrie L. Raik, MD
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Palminder Raina, PhD, BSc
Department of Clinical Epidemiology & Biostatistics
McMaster University
Hamilton, Ontario, Canada

Bharathi Raman, MD
Division of Geriatrics and Gerontology
Weill Cornell Medical College,
New York, NY

Arun S. Rao, MD
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Satish S. Rao, MD
Department of Medicine
Carver College of Medicine
University of Iowa
Iowa City, IO

M. Cary Reid, MD, PhD
Division of Geriatrics and Gerontology
Weill Cornell Medical College
New York, NY

Barbara Resnick, PhD, RN, CRNP, FAAN
School of Nursing
University of Maryland
Baltimore, MD

Sandra L. Reynolds, PhD
School of Aging Studies
University of South Florida
Tampa, FL

Louis B. Rice, MD
Medical Service
Veterans' Administration Medical Center
Cleveland, OH

Chelsey L. Richards, Jr., MD, MPH, FACP
Division of Healthcare Quality Promotion
National Center for Preparedness, Detection and Control of Infectious Diseases Centers for Disease Control and Prevention
Atlanta, GA

Ellen K. Ritchie, MD
Division of Hematology and Oncology
Weill Cornell Medical College
New York, NY

Sara E. Rix, PhD
Public Policy Institute
American Association of Retired Persons
Washington, DC

Jean-Marie Robine
Val d'Aurelle – Parc Euromedicine
Montpelier, France

Janet Robinson, DO
CampLejeune Family Medicine Residency
Camp Lejeune, NC

Carmen Rodriguez, PhD, ARNP
Department: Adult and Elderly
College of Nursing
University of Florida
Gainesville, FL

Lois Roelofs, PhD, RN
Formerly, School of Nursing
Trinity Christian College
Palos Heights, IL

Anissa T. Rogers, PhD, MSW, MA
Department of Social and Behavioral Sciences
Social Work Program
University of Oregon
Portland, OR

Peri Rosenfeld, PhD
Center for Home Care Policy and Research
The Visiting Nurse Service of New York
New York, NY

Mary T. Roth, PharmD, MPH
Pharmaceutical Policy and Evaluative Sciences Division
University of North Carolina at Chapel Hill
Chapel Hill, NC

Laurence Rubenstein, MD, MPH
UCLA David Geffen School of Medicine and
VA Greater Los Angeles Healthcare System
Los Angeles, CA

Kathy L. Rush, RN, PhD
Faculty of Health and Social Development
The University of British Columbia Okanagan
Kelowna, British Columbia, Canada

Carlene Russell, MS, RD, LD
Iowa Department of Elder Affairs
Des Moines, IA

Linda Russell, MD
Department of Rheumatology
Hospital for Special Surgery
New York, NY

Joseph E. Safdieh, MD
Department of Neurology
Weill Cornell Medical College
New York, NY

Debra Saliba, MD, MPH
Geriatric Research Education and Clinical Center
VA Greater Los Angeles Health Care System
Los Angeles, CA

P. Lina Santaguida, PhD
Department of Clinical Epidemiology & Biostatistics
McMaster University
Hamilton, Ontario, Canada

Elizabeth J. Santos, MD
Department of Psychiatry
University of Rochester Medical Center
Rochester, NY

Alessandra Scalmati, MD, PhD
Division of Geriatric Psychiatry, Department of Psychiatry and Behavioral Science
Albert Einstein College of Medicine
Bronx, NY

Andrew E. Scharlach, PhD
School of Social Welfare
University of California Berkeley
Berkeley, CA

Ann A. Scheve, MS, RN
School of Nursing
University of Maryland
Baltimore, MD

Barbara W. Schneider, MS
Consultant, Cash and Counseling
Everson, PA

John Schnelle, PhD
Department of Medicine
David Geffen School of Medicine at UCLA
Los Angeles, CA

Eric W. Schrimshaw, MA
Mailman School of Public Health
Columbia University
New York, NY

Robert A. Schulman, MD
Center for Complementary and Integrative Medicine
Weill Cornell Medical College
New York, NY

H. Christian Schumacher, MD
Department of Neurology
Columbia University Medical Center
New York, NY

Edna P. Schwab, MD, MPH
Division of Geriatric Medicine
University of Pennsylvania
Philadelphia, PA

Karen R. Seidman, MPA
Lighthouse International
New York, NY

Jamie M. Seitz, BS
Occupational Therapy Department
University of Wisconsin Milwaukee
Milwaukee, WI

Julie F. Sergeant, PhD
Office of Aging and Long Term Care
University of Kansas
Lawrence, KS

Tara Sharpp, RN, BSN, PhD (C)
School of Nursing
University of California
San Francisco, CA

Mary Shelkey, PhD, RN
School of Nursing
Seattle University
Seattle, WA

Juliette Shellman, PhD, RN, MSN
School of Nursing
Yale University
New Haven, CT

Andrea Sherman, PhD
College of Nursing
New York University
New York, NY

Deborah Witt Sherman, PhD, APRN, ANP, PCM, BC, FAAN
College of Nursing
New York University
New York, NY

Heajong Shin, PhD, MSW
Department of Social Welfare
Soonchunhyang University
Asan, Chungnam, South Korea

Jonathan A. Ship, DMD
Bluestone Center for Clinical Research
College of Dentistry
New York University
New York, NY

Hilary C. Siebens, MD
Siebens Patient Care Communications
Seal Beach, CA

Karolynn Siegel, PhD
Mailman School of Public Health
Columbia University
New York, NY

Lori Simon-Rusinowitz, PhD
Department of Health Services Administration and Center on Aging
University of Maryland
College Park, MD

Eleanor M. Simonsick, PhD
National Institute for Aging and
The Johns Hopkins School of Medicine
Baltimore, MD

Lizette J. Smith, MD
University Medical Practice Associates
New York, NY

Carole Smyth, MSN, APRN, BC, A/GNP
Medical House Call Program
Montiofiore Medical Center
Bronx, NY

Rhayun Song, RN, PhD
Department of Nursing
Chungnam National University
Dae Jeon, South Korea

David Sparrow, DSc
Department of Medicine
Boston University School of Medicine
Brookline, MA

Janet P. Specht, PhD, RN, FAAN
College of Nursing
University of Iowa
Iowa City, IA

Ann Marie Spellbring, PhD, RN, FAAN, FNGNA
Formerly, School of Nursing
University of Maryland
Baltimore, MD

Maria Spinelli, NP
Division of Cardiology
New York Presbyterian Hospital- Weill Cornell Campus
New York, NY

Clark Stanford, DDS, PhD
Department of Prosthodontics
College of Dentistry
University of Iowa
Iowa City, IA

Paul Stiles, JD, PhD
Mental Health Law and Policy
Florida Mental Health Institute
University of South Florida
Tampa, FL

Leroy O. Stone, PhD
Analytical Studies
Statistics Canada
Ottawa, Canada

Robyn Stone, DrPH
Institute for the Future of Aging Services
American Association of Homes and Services for the Aging
Washington, DC

Agnes Strandberg
Kaiser Foundation Health Plan, Inc.
Oakland, CA

Robert J. Sullivan, Jr., MD
Department of Community and Family Medicine
Duke University Medical Center
Durham, NC

David Sutin, MD
Department of Medicine
New York University
New York, NY

Karen Talerico, RN, PhD
Amann Talerico Consulting
Portland, OR

Anne C. Thomas, PhD, RN, CS, ANP, GNP
School of Nursing
University of Michigan
Ann Arbor, MI

Concetta M. Tomaino, DA, MT-BC, LCAT
Institute for Music and Neurologic Function
Beth Abraham Family of Health Services
Bronx, NY

John A. Toner, EdD, PhD
Geriatric Psychiatry Residency and Fellowship Programs
Columbia University
New York, NY

Edgar A. Tonna, PhD, FRMS
Institute for Dental Research
New York University Dental Center
New York, NY

Colin Torrance, RN, PhD
Western Health, Sunshine Hospital
St. Albans, Victoria, Australia

Michael Uebel, PhD, MSSW
Houston-Galveston Psychoanalytic Institute
Houston, TX

Mary Grace Umlauf, PhD, RN, FAAN
School of Nursing
University of Alabama
Birmingham, AL

Linda Valentino, RN, MSN
Neuroscience & Speciality Nursing
New York Presbyterian – Columbia
New York, NY

Glen Van Andel, ReD
HPERDS
Calvin College
Grand Rapids, MI

Maria L. Vezina, RN, EdD
Department of Nursing Education
Mount Sinai Hospital
New York, NY

Fredda Vladeck, CSW
United Hospital Fund
New York, NY

Nancy S. Wadsworth, PhD, MSSA
Gestalt Institute of Cleveland
Cleveland, OH

Laura M. Wagner, PhD, RN
Kunin-Lunenfeld Applied Research Unit
Baycrest Centre for Geriatric Care
Toronto, Canada

Edith G. Walsh, PhD, RN
Disability and Long-Term Care Program
RTI International in the Aging
Waltham, MA

Julie Walton, PhD
HPERDS
Calvin College
Grand Rapids, MI

Camille B. Warner, PhD, MA
Bolton School of Nursing
Case Western Reserve University
Cleveland, OH

Terri E. Weaver, PhD, FAAN, RN
School of Nursing
University of Pennsylvania
Philadelphia, PA

Nanette K. Wenger, MD, FACC, FAHA, MACP
Department of Cardiology
Emory School of Medicine
Atlanta, GA

Heidi K. White, MD, MHS
Department of Medicine
Duke University Medical Center
Durham, NC

Peter J. Whitehouse, MD, PhD
School of Medicine
Case Western Reserve University
Cleveland, OH

Gary S. Whitford MSW MDiv PhD
Department of Social Work
Cloud State University
St. Cloud, MN

Fay W. Whitney, PhD, RN, FAAN
Fay W. Whitney School of Nursing
University of Wyoming
Laramie, WY

Dorothy Wholihan, MSN, ANP-BC, APRN, BC-PCM
College of Nursing
New York University
New York, NY

Joshua M. Wiener, PhD
Aging, Disability, and Long-Term Care
RTI International
Washington, DC

Stacy Schantz Wilkins, PhD, ABPP/CN
VA Medical Center of West Los Angeles
David Geffen School of Medicine at UCLA
Los Angeles, CA

Tim J. Wilkinson, MB, ChB, FRACP, MClinED
Health Care of the Elderly
The Princess Margaret Hospital
Christchurch, New Zealand

Nancy L. Wilson, MA, LMSW
Huffington Center on Aging
Baylor College of Medicine
Houston, TX

Sarah Wilson
Department of Biology
University of South Florida
Tampa, FL

Jennifer L.Wolff, PhD, MHS
Department of Health Policy and Management
Bloomberg School of Public Health
Baltimore, MD

Yukari Yamada, RN, MHSC
Department of System Management in Nursing
Tokyi Medical Dental University
Tokyo, Japan

Donna L. Yee, PhD, MSW
Asian Community Center
Sacramento, CA

Dana Zappetti, MD
Weill Cornell Pulmonary Associates
Weill Cornell Medical College
New York, NY

Jonathan A. Zelken, BA
Hospital for Special Surgery
New York, NY

Cora D. Zembrzuski, PhD, APRN
MedOptions, Inc.
Old Saybrook, CT

FOREWORD

The second edition of *The Encyclopedia of Elder Care* heralds a new era in our field: that of data-based practice excellence and a proliferation of scientists in the field. Thanks to the support of the John A. Hartford Foundation in New York City, there is a heretofore unimaginable number of individuals being appropriately trained to provide evidence-based care to older adults and further gerontological research, which then guides our practice.

This encyclopedia is a compendium that reflects on that new growth in leadership and knowledge in the field. Drs. Capezuti, Siegler, and Mezey are to be congratulated for their remarkable ability to assemble the most outstanding researchers, clinicians, and policy makers to author these informative and useful chapters. Further, the need for interdisciplinary approaches to patient care is no longer optional. The Institute of Medicine Report (2003), *Health Professions Education: A Bridge to Quality,* reminds us of the essential nature of teaming and evidenced-based practice for quality outcomes.

With the "agewave" upon us, inconceivable numbers of older adults will be seeking appropriate, humane, quality care that is data-driven and responsive to the best information in hand. *The Encyclopedia of Elder Care* provides that "best information" and creates a new baseline from which professions focused on care in aging will continue to thrive and grow.

Terry Fulmer, PhD, RN, FAAN
College of Nursing
New York University

ACKNOWLEDGMENTS

The editors would like to acknowledge the following authors, who contributed to the first edition of *The Encyclopedia of Elder Care*:

Marsha Aaron, BS
Laila Abdullah, BS
Toshiko Abe, RN, PhD
Kathryn Betts Adams, MSW, LCSW-C
Cathy Alessi, MD
Stacy S. Amano, MA
Stanley J. Anderman, MSW, PhD
May Ann Anderson, RN, PhD
Patricia G. Archbold, RN, DNSc, FAAN
Susan J. Aziz, MA
Luc Baert, MD, PhD
David Baldridge
Amy Barlow, RN, MS, CRCP
Steven Bartz, MD
Bennett Blum, MD
Jeremy Boal, MD
Edgar Borgatta, PhD
Melissa M. Bottrell, PhD, MPH
Meg Bourbonniere, MS, RN
Maura Brennan, MD
Patrick J. Brennan, MD
Denise Burnette, PhD, MSSW
K. R. Byju, MD
Christopher M. Callahan, MD
Michael Callen
Christine K. Cassel, MD
Jean Cassidy, CNM, DrPH
Joshua Chodosh, MD
Robert L. Clark, PhD
Peter Cleary
Ann Coffman, PT, MS, GCS
Michael Corcoran, MD
Constance Saltz Corley, PhD, LCSW
Barbara Corrigan, MS, RN, CS
Kenneth E. Covinsky, MD, MPH
Craig Curry, MD
Cheryl A Dallasega, PhD, GNP
Carol M. Davis, EdD, PT
Mia Defever, PhD
Annemarie Dowling-Castronovo, MA, GNP-CS
Nandy N. Dubler, LLB
Robert W. Duff, PhD
Charles A. Emlet, PhD, ACSW
Steven J. Ersser, PhD, RGN
David V. Espino, MD
George C. M. Evers, PhD, RN, FEANS
Sanford I. Finkel, MD
Ellen Flaherty, PhD, RN,
Barry Fortner, PhD
Robert Friedland, PhD
Margaretta E. Gennantonio, MD
Robyn Golden, MSW
Marsha E. Goldwin-Beck
Stuart Green, MD
Lynn Greenberg, RD, MS, LD
Sherry Greenberg, MSN, RN, CS
Robert Greenwood
Murran Grossman, MD
Lisa Gwyther, MSW
Kathy M. Haag, RN
Bernadette B. Hackett, LCSW
Alice H. Hedt, MUA
Lelia B. Helms, PhD, JD
Dorothy G. Herron, PhD, RN, CS
Elizabeth E. Hill-Westmoreland, RN, MS, CS
Cynthia Holzer, MD
Cynthia Hughes Harris, EdD, OTR, FAOTA
Pamela Ingham
Jerry C. Johnson, MD
Jason H. T. Karlawish, MD
Mary Katsikitis, PhD, MAPS
John R. Kelly, PhD
Denis Keohane, MD
Salil Khandwala, MD
Mary T. Knapp, MSN, GNP, NHA, FAAN
Natalya Kozlova, MD

Jerome E. Kurent, MD
Anna Lamnari, MD
Donna Larkin
Beth Latimer, RN, MA, GNP
Sylvie Lauque, RN
M. Powell Lawton, PhD
Susan Markey
Mary J. Marzullo, RN, BSN
Mary Ann Matteson, PhD, RN, CNS, FAAL
Cathy McEvoy, PhD
Eileen M. McGee, RN, MSN
Joan Meehan
Kurt P. Merkelz, MD
Jean-Pierre Michel, MD
Ahmed A. Mirza, MD
Kanika P. Mody
Abraham Monk, PhD
Catherine Morency, MS, RN
Amy Morgan, PharmD
John E. Morley, MB, BCh
Laura Mosqueda, MD
Charles P. Mouton, MD
Michael Mullan, MD, PhD
Robert J. Myers, LLD
Joseph B. Narus, GNP, MA, RN, CS
Corrie J. Odom, PT, DPT, ATC
Morris A. Okun, PhD
M. Louay Omran, MD
Kathleen A. Ondus, MSN, RN, CS
Martin Orrell, PhD, FRCPsych
Tom Otwell
David A. Peterson, PhD
Patricia P. Pine, PhD
Carol Porter, PhD, RD, FADA
Valery A. Portnoi, MD
Lidia Pousada, MD, FACP, AGSF
Lorrie L. Powel, PhD, RN Charles T. Pu, MD
Phyllis Ramzel, RN, MA
Amie L. Rang, BA
Michael Reinemer
Mohammed Reyazuddin
Carole M. Rhodes, ARNP, MS
Dan Richards, MD
J. Scott Roberts, PhD
Mona Rosenthal, MPH
Brenda Rosenzweig, MD
Mary Ann Russwurm, EdD, RN FAAN
Julie M. Sazant, MSW
Chol Shin, MD, PhD, FCCP
Kyung Rim Shin, RN, EdD, FAAN
Mort Soroka, PhD
Elaine Souder, PhD, RN
Aimee Spector, PhD
Melinda Anne Stanley, PhD
Alan M. Stark, DDS, ASGD
Els Steeman, RN, MSN
Richard Stein, MD
Barbara Stewart, PhD Gordon F. Strieb, PhD
Neville E. Strumpf, PhD, RN, FAAN
Jeannette Takamura, PhD, MSW
Catherine J. Tompkins, PhD, MSW
R. Alexander Vachon, PhD
Ben Van Cleyenbreugel, MD
Luc Van de Ven, PhD
Bruno Vellas, MD
Martha S. Waite, MSW
Meredith Wallace, PhD, RN
Kenneth Walsh, RPN, RGN
Renee Warshofsky-Altholz, CSW
Jeanne Y. Wei, MD, PhD
Thelma Wells, PhD, RN, FAAN, FRCN
Darryl Wieland, PhD
Kathy Wilson
Mary Lee Wong, MD
Janet Yellowitz, DMD, MPH
Nancy Xiaoshuang Yin, MD
Dottie Zoller

LIST OF ENTRIES

Hearing Aids
Hearing Impairment
Heart Failure Management
Heartburn
Hematopoiesis
Hip Fractures
Hispanic and Latino Elders
Home Health Care
Homeless Elders
Homosexual Elders
Hospice
Hospital-Based Services
Hospital Elder Life Program (HELP)
Human Immunodeficiency Virus (HIV) and AIDS
Hypertension

Iatrogenesis
Immigrant Elders
Immunization
Incontinence
Infection Transmission in Institutions: Pneumococcal Pneumonia
Information Technology
Injury and Trauma
Institutional Mistreatment: Abuse and Neglect
Institutionalization
Integumentary System
Intergenerational Care
International Psychogeriatric Association
Interviewing
Intra-Articular Therapy

Joint Replacement: Lower Extremity

Kidney and Urinary System

Latino Elders
Leisure Programs
Life Events
Life Expectancy
Life Extension
Life Review
Long-Term-Care Financing: International Perspective
Long-Term-Care Policy
Low Vision

Managed Care
Meals on Wheels
Measurement
Measuring Physical Function
Medicaid
Medicare
Medicare Managed Care
Medicare Part D Benefit
Medication Adherence
Mental Capacity Assessment
Mental Health Services
Mild Cognitive Impairment: Controversy in Nomenclature and Treatment
Mini-Mental State Examination
Money Management
Morbidity Compression
Multidimensional Functional Assessment: Instruments
Multidimensional Functional Assessment: Overview
Muscle Cramps
Musculoskeletal System
Music Therapy

National Asian Pacific Center on Aging
National Citizens' Coalition for Nursing Home Reform
National Conference of Gerontological Nurse Practitioners
National Council on the Aging
National Gerontological Nursing Association
National Indian Council on Aging
National Institute on Aging
National Long-Term-Care Ombudsman Program
Naturally Occurring Retirement Communities (NORCs)
Neurological Changes in the Elderly
Neuropsychological Assessment
Neuropsychologists
Nonpharmacological Treatement
Nurse Competence in Aging
Nursing Homes
Nursing Home Admission
Nurses Improving Care to Health System Elders (NICHE)

THE ENCYCLOPEDIA OF ELDER CARE

THE COMPREHENSIVE RESOURCE ON GERIATRIC AND SOCIAL CARE

SECOND EDITION

A

AARP (PREVIOUSLY THE AMERICAN ASSOCIATION OF RETIRED PERSONS)

AARP is the leading nonprofit, nonpartisan membership organization for people age 50 and older in the United States and has more than 35 million members. AARP provides information on issues important to this age group; advocates on legislative, consumer, and legal issues; promotes community service; and offers special products and services to members.

U.S. citizenship is not a requirement for membership; more than 40,000 members live outside the United States. Forty-four percent of AARP members work part time or full time. For these reasons, AARP shortened its name in 1999 from the American Association of Retired Persons to just four letters: AARP. The median age of AARP members is 65, and slightly more than half of them are women.

Dr. Ethel Percy Andrus, a retired high school principal, founded AARP in 1958. AARP evolved from the National Retired Teachers Association (NRTA), which Dr. Andrus had established in 1947. At that time, private health insurance was virtually unavailable to older Americans. Dr. Andrus approached dozens of insurance companies until she found one willing to take the risk of insuring older persons.

AARP is organized into a central headquarters, an office in every state—as well as the District of Columbia, the Virgin Islands, and Puerto Rico—and more than 2,500 local chapters.

AARP's national headquarters is located in Washington, DC, which allows staff and volunteer leaders access to the federal government. National headquarters coordinates the activities of the field operations and state offices and provides support to the chapters, which are separately incorporated groups that provide members with opportunities to come together to volunteer in their own communities.

AARP has two affiliated groups: (1) the AARP Foundation is AARP's affiliated charity, with its mission to build a society in which everyone ages with dignity and purpose by delivering information, education, and direct service; and (2) AARP Services, Inc. (ASI), which is a wholly owned subsidiary of AARP. ASI manages a range of products and services for AARP members, provides marketing services, and manages the AARP Web site.

Members of AARP receive *AARP Magazine* bimonthly and the *AARP Bulletin*, published 11 times a year. The publications *Segunda Juventud* and *La Opinión* cater to Spanish-speaking elders. Other services include AARP's Research Information Center, radio programs, advocacy activities, and international awareness activities. AARP Programs include AARP Independent Living/Long-Term Care/End-of-Life Issues, AARP Driver Safety Program, AARP Tax-Aide, AARP Senior Community Service Employment Program (SCSEP) and Volunteering.

EDITORIAL STAFF

Internet Resources

American Association of Retired Persons
http://www.aarp.org

ABUSE

See
Crime Victimization
Elder Mistreatment
Elder Neglect
Financial Abuse

ACCESS TO CARE

The social responsibility to provide essential health and social services relies on equitable access to care. Growing demands on the health care system are predicated on the development of new technologies related to the detection and treatment of disease as well as the growth of the older population and the concomitant increase in chronic illness and disability. The current delivery system is challenged to provide access to both acute and long-term care. Inequity in access to health care services, appropriate use of services, quality of care, and escalating costs are four major health care policy issues that compete for attention in the 21st century (Gold, 1998).

Health insurance coverage and proximity to providers as a usual source of care are the predominant measures of equitable access (Gold, 1998). The vast majority of older persons have basic health care coverage/benefits through Medicare (97% of elders) and 70% of elders have additional coverage through private insurance. Only 7.8% receive Medicaid and 2% of elders have no coverage at all. Overall, only 10% of older adult health care costs are covered by Medicaid, 15% of the costs by other than federal payers, and 21% by out-of-pocket payment (Federal Interagency Forum on Aging Related Statistics, 2004). Although the number of elders who have Medicaid coverage is small, the numbers vary greatly when broken down by race. Only 5.4% of White elders compared to 19.3% African American and 27.6% Hispanic elders are covered by Medicaid (U.S. Centers for Disease Control and Prevention, National Center for Health Statistics, 2000).

Differential access must be considered as a contributing factor in health status, service utilization rates, costs of care, treatment trajectories, and intervention outcomes (Newcomer & Benjamin, 1997). Residents of inner-city and rural areas experience access barriers to health care coverage. Race and ethnicity are important predictors of poor health care access for older persons (Wallace, 2005). The result is often higher morbidity and mortality rates among minority populations. Additionally, gender differences in chronic disease prevalence increase the need for long-term care services for older women. As an example, diabetes is at least two to four times as high among African American, Hispanic, American Indian, and Asian Pacific Islander women as it is among White women (Agency for Healthcare Research and Quality [AHRQ], 2004). Further, the life course impact of differential prevalence of diseases relates to the need for access to a range of services.

Defining Access

Defining and measuring access requires differentiating access from related dimensions of health care delivery such as service availability, utilization, appropriateness, quality, and satisfaction. Availability simply means that the services exist and there is a possibility of use. Access implies that the available services are approachable and that the means to use them is reachable. Utilization is an essential element of measurement of access. However, the related elements of need and appropriateness of the service must be considered. Finally, quality and satisfaction are related to access. Poor-quality services may generate high utilization rates when the care is urgently needed. However, for less needed services, low patient satisfaction may lead to low utilization of available and otherwise accessible services.

The measurement of access can be constructed by asking two questions: What is the utilization rate as measured by the number of encounters of a particular service? What is the estimate of prevailing need within the target population differentiated by age, gender, and racial/ethnic group? Unmet need or inequities in access are measured by calculating the estimate of the condition in the given population minus the number of encounters or utilization rate (Newcomer & Benjamin, 1997). Access evaluation relies on agency documentation of encounters and claims and regional or national estimates of need.

Access must be defined in a specific relationship to a type of service. For older adults, important components of access to care include physicians, hospital, rehabilitation, nursing home, other therapeutic programs, skilled/nonskilled home care, specialized living arrangements, and other social services. Accessibility within a community is measured by utilization rates in relationship to the total population in need (Newcomer & Benjamin, 1997).

Appropriate utilization of a particular level of care should be assessed at the individual and community levels. The placement of individuals in nursing homes based on assessment using the Minimum Data Set has not always considered individual preference, and this has become the focus of the Ohlmstead Decision leading to the demand for increased access to community-based alternatives. Preventive, acute, and chronic care services for the elderly present different challenges of both availability and accessibility (Wallace, 2005).

Creating Acceptability

Despite its accessibility, a service may not be acceptable or preferred. Acceptability connotes the perceived usefulness as well as "user friendliness" of the service to the particular population in question. Low utilization rates by minority elderly raise questions about preference for as well as availability of and access to other forms of family- and community-based care for ethnic elders. Structural barriers associated with costs of care, intensity and duration of service, and location preclude drawing the conclusion that preference alone determines minority groups' utilization of care settings. Even a public managed-care system such as the Veterans Health Administration can present structural barriers to access and acceptability (Damron-Rodriguez et al., 2004).

Quality of care and consumer satisfaction are related to acceptability and accessibility. A service may be acceptable or unacceptable to a particular population of elders. If a service is acceptable, then the elders may be very satisfied or only mildly satisfied based on quality and other factors. The professional quality of an acceptable service may be technically very high but yield low consumer satisfaction if it is provided in an unacceptable manner. Thus, access is an essential but not sufficient condition to assure utilization of services.

Recommendations for Accessible Care That Are Appropriate and Acceptable

Providers aiming to increase access to services must address both structural and cultural barriers. The Robert Wood Johnson Foundation (RWJF) (2003) addresses important access issues in its analysis of best practices in community-based settings that aim to decrease health disparities. Key findings of the report are used as examples in each of the following domains of access.

Appropriate Care

Access must consider the match of the services with the older person's need, including health status, functional level (i.e., cognitive, physical, and social), and acute and chronic health conditions. Program characteristics include the comprehensiveness and intensity of the intervention, dimensions of assessment, disciplines involved, rehabilitation components, and length of treatment. The best practice from the RWJF Annual Report (2003) related to appropriateness was the mobilization and management of the continuum of resources.

Acceptable Care

Population characteristics that must be considered in relationship to the accessibility of appropriate service include income, health care coverage, immigration status, residence, neighborhood, level of disability, and living arrangements. Program characteristics include affordability, desired hours of operation, accommodating location or available transportation, timeliness of service provided, minimal intake procedures and paperwork, and outreach and information. Failure to consider population characteristics can lead to structural barriers that will significantly limit access. The RWJF (2003) found that the outreach that is most needed is "one to one" in its approach.

Cultural barriers can make an accessible program or service unacceptable. Population characteristics to consider when creating acceptable services include ethnicity, language, family support systems, education, generations in this country, and acculturation. Program characteristics include cultural and language competence and family enabling policies. The RWJF (2003) best practices exemplified the operationalization of cultural competence at the level of the community-based organization.

Although less commonly construed as such, accessibility also relates to informal care. Individuals may not have access to family care based on conditions embedded in their social support system. For example, a key family caregiver may be ill or otherwise unable to provide personal or instrumental assistance, there may be no living family, or the family may be geographically dispersed. Information and outreach services for long-term care should be targeted to elders with limited access to informal support.

Access maximization means providing the right services for the right population at the right time and place in a manner that ensures quality and satisfaction. Underlying what providers can do to create better access locally are regional, state, and federal policy initiatives needed to ensure equitable access through adequate health care coverage.

JOANN DAMRON-RODRIGUEZ

See also

Future of Care
Long-Term Care Financing
Medicaid
Medicare
Medicare Managed Care
Risk Assessment and Identification

Internet Resources

Agency for Healthcare Research and Quality: National Health Care Disparities Report 2004
http://www.ahrq.gov/

Federal Interagency Forum on Aging Related Statistics: Older Americans 2004: Key Indicators of Well-Being
http://www.agingstats.gov

Robert Wood Johnson Foundation
http://www.rwjf.org

U.S. Centers for Disease Control and Prevention, National Center for Health Statistics
http://www.cdc.gov/nchs

REFERENCES

Agency for Healthcare Research and Quality: National Health Care Disparities Report 2004. Available at http://www.ahrq.gov/

Damron-Rodriguez, J. A., White-Kazemipour, W., Washington, D., Villa, V. M., Dhanani, S., & Harada, N. D. (2004). Accessibility and acceptability of the Department of Veteran Affairs health care: Diverse veterans' perspectives. *Military Medicine*, *169*(3), 243–250.

Federal Interagency Forum on Aging Related Statistics: Older Americans 2004: Key Indicators of Well-Being. (2004). Available at http://www.agingstats.gov

Gold, M. (1998). Beyond coverage and supply: Measuring access to healthcare in today's market. *Health Services Research*, *33*(3), 625–632.

Newcomer, R. J., & Benjamin, A. E. (1997). *Indicators of chronic health conditions: Monitoring community-level delivery systems*. Baltimore, MD: The Johns Hopkins University Press.

Robert Wood Johnson Foundation (2003). *An analysis of community-based approaches to ending health disparities*. Princeton, NJ: Final Report of the Robert Wood Johnson Foundation.

U.S. Centers for Disease Control and Prevention, National Center for Health Statistics (2000). Available at http://www.cdc.gov/nchs.

Wallace, Steven P. (2005). The public health perspective on aging. *Generations*, *29*, 25–10.

ACTIVE LIFE EXPECTANCY

As life expectancy at birth approaches or exceeds 85 years for women and 80 years for men in several countries (www.prb.org/), the question about the quality of those years takes on more and more importance. Thus, in 2000, the World Health Organization (WHO) attempted to estimate the value of "healthy life expectancy" for each Member State; however, the indicator, called Disability Adjusted Life Expectancy (DALE), was too complicated and the data necessary for its calculation were absent (www.who.int/en/). The United States of America (USA), through Healthy People 2010, chose a simpler indicator for monitoring the quality of the years lived by its population called Years of Healthy Life (YHL) and defined it as life without disability (www.healthypeople.gov/). In 2005, the European Union (EU) chose a similar indicator called Healthy Life Years (HLY) as one of the structural indicators aimed at monitoring its sustainable development (http://ec.europa.eu/health/index_en.htm).

The two indicators, YHL used in the USA and HLY used in the EU, are similar in their method of computation (i.e., the Sullivan method) and data used (i.e., observed prevalence of disability), but they are not identical. Similar indicators are computed by other Organization for Economic Cooperation and Development (OECD) countries such as Australia, Canada, and Japan. Their main feature is to combine mortality and morbidity (here, disability) in a single metric to provide a summary measure of population health (SMPH), under the generic term of health expectancies. As for life expectancy at birth, one of the main (potential) interests of health expectancies is to be comparable among countries. Therefore, one of the next steps in their development is their harmonization.

Active life expectancy (ALE) is one of these health expectancies that combine mortality and morbidity in a single metric. More specifically, ALE, sometimes called healthy active life expectancy as in the United Kingdom (Jagger & Reyes-Frausto, 2003), combines mortality data with data on the performance of personal activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Because it aims to measure how long people live or can live independently, ALE should be computed with data on the receipt of help or need for help to perform ADLs and IADLs, respectively. When difficulty in performing ADLs and IADLs is used instead, the corresponding health expectancy belongs to the neighboring class of life expectancy without disability and, more precisely, without activity restriction. However, the terminology related to this summary measure of population health (SMPH) has yet to be agreed internationally (Robine et al., 2003).

Health expectancies, such as ALE, answer the question of whether "healthy life expectancy" is increasing faster or slower than overall life expectancy. This question followed the observation of a mortality decline among the elderly in the 1970s that resulted in the contradictory theories of pandemic of chronic diseases and disabilities (Kramer, 1980), compression of morbidity (Fries, 1980), and dynamic equilibrium (Manton, 1982). According to Kramer, the fall of mortality among the elderly is necessarily accompanied by an expansion of morbidity such as dementia and associated disability. On the contrary, Fries thought that the postponement of the onset of the main degenerative diseases leads to a compression of morbidity due to the fact that improvement in survival is now limited. Between these two theories, Manton suggested that whereas the fall of mortality among the elderly will increase the prevalence of chronic disease, advances in medical care will slow down their development and postpone their most severe consequences, such as disability.

In 1984, a general model of health transition was proposed to the WHO to assess the likelihood of different health scenarios. This model distinguishes overall life expectancy, disability-free life expectancy, and morbidity-free life expectancy. It allows the pandemic of chronic diseases and disabilities, the compression of morbidity, and other scenarios such as the dynamic equilibrium to be expressed as interrelationships between the life expectancy and the other two health expectancies (i.e., disability-free and morbidity-free life expectancy).

Compared to a more general disability-free life expectancy at birth, ALE generally is computed from age 65 and only concerns older people. It aims specifically to answer the question of how long older people can live independently under the current epidemiological and social conditions. Accordingly, it is computed using data on the receipt of or the need for help to perform ADLs. Most studies use only data on ADL when computing ALE, but some combine ADLs and IADLs to provide severity levels such as (1) being independent, (2) being dependent in household care activities only, and (3) being dependent in personal care activities, as a result of the hierarchical properties of the ADL–IADL items. Acquiring information on how older people perform in daily life and providing chronological series on ALE were two of the main reasons for establishing specific aging surveys in the 1980s, such the Longitudinal Survey on Aging (LSOA) and the National Long Term Care Survey (NLTCS) in the United States, as well as the introduction of ADL- and IADL-type questions in other surveys, such the U.S. National Health Interview Survey (NHIS).

Since 1989, an international research network, Réseau Espérance de Vie en Santé/Network on Health Expectancy (REVES; www.reves.net), has coordinated research on health expectancies, and a number of international agencies (e.g., OECD, WHO) have underlined the need of such measures. Indeed, in the final communiqué of its 1997 summit in Denver, the G8 encouraged collaborative biomedical and behavioral research to improve active life expectancy and reduce disability. With a span of now 20 years or more, the long chronological series of ALE allows better forecasting of future elderly populations. According to one of the most recent studies in the United States, the proportion of life expectancy that is active at age 65 increased from 72.8% in 1982 to 78.5% in 1999, illustrating a strong compression of morbidity at older ages. Two different scenarios may lead to a proportion higher than 80% in 2022 while life expectancy at age 65 continues increasing (Manton, Gu, & Lamb, 2006).

The principle of any health expectancy calculation is to separate the years lived by the population of a life table between two ages into the years lived in good health and the years lived in bad health. There are basically two methods for this. The prevalence life table method (i.e., Sullivan) uses the observed cross-sectional prevalence to estimate the period prevalence of health problems introduced in the summary indicator (Jagger, 1999). The multistate life table method, on the other hand, uses the observed transitions between health states and death to compute the period prevalence of the health problem. From a mathematical point of view, the multistate life table method is to be preferred because it is homogeneous with the period life table used to compute yearly life expectancy. However, only longitudinal surveys with at least two waves or panel surveys can provide the needed transitions.

From a practical point of view, the prevalence life table method is popular due to the greater availability of cross-sectional surveys. For health monitoring, the key issue is the repetition of the same survey over time. Chronological series of cross-sectional surveys such as the NHIS are available in a number of countries, but repeated comparable longitudinal surveys over time are rare. These advantages and disadvantages explain why both methods are currently used. In both cases, the sum of complementary health expectancies is always equal to life expectancy (LE); for example, ALE plus dependent life expectancy (DLE) (i.e., life expectancy with need of help to perform daily activities) is equal to total LE (i.e., ALE + DLE = LE). LE can be decomposed into as many states as we like; for example three states (i.e., independent LE + LE with need of help to perform IADL only + LE with need of help to perform personal ADL). Health expectancies can also be divided: the ratio of active LE to total LE represents the part of LE lived independently (generally expressed as a percentage). Being independent of the size of populations and of their age structure, health expectancies allow direct comparison of the different groups that comprise populations—for example, sexes, socio-professional categories, regions—allowing health inequalities to be properly monitored.

ALE is only one of the possible health expectancies. Current recommendations from the main health authorities in North America and Europe are for a small set of health expectancies to more comprehensively cover the different health dimensions. For example, in the USA, the set of summary measures recommended for monitoring progress toward the first goal of Healthy People 2010 includes Years of Healthy Life (YHL) defined as life without disability,YHL as used for Healthy People 2000, YHL without functioning problems, YHL without specific diseases, YHL in excellent or very good health, and YHL lived with good health behavior.

In Europe, public health and health statistics authorities use a small set of questions called the Mini European Health Module, which allows the computation of three health expectancies covering several health dimensions: activity limitation, chronic conditions, and perceived health. Many countries using health expectancies contrast a minimum of two kinds of summary measures: one dealing with disability or dependence in daily life and one dealing with perceived health (e.g., Denmark and the United Kingdom) (http://www.statistics.gov.uk).

Although there has been an initial failure to develop an international summary measure of population health, existing sets of indicators such as those used in the USA and EU point the way forward for a common effort with strong involvement from countries prioritizing simple methodology and well-accepted health concepts. All this suggests that ALE is a good candidate for such harmonization.

JEAN-MARIE ROBINE

See also

Demography of Aging
Morbidity Compression
Multidimensional Functional Assessment

Internet Resources

European Union: Healthy Life Years
http://http://ec.europa.eu/health/index_en.htm

Healthy People 2010: Years of Healthy Life (YHL)
http://www.healthypeople.gov/

Population Reference Bureau
http://www.prb.org/

REVES (Réseau Espérance de Vie en Santé/ Network on Health Expectancy)
http://www.reves.net

World Health Organization: Healthy Life Expectancy
http://www.who.int/en/

REFERENCES

Fries, J. F. (1980). Aging, natural death, and the compression of morbidity. *New England Journal of Medicine*, *303*(3), 130–135.

Jagger, C. (1999). *Health expectancy by the Sullivan Method: A practical guide* (NUPRI Research Paper Series No. 68). Tokyo: Nihon University.

Jagger, C., & Reyes-Frausto, S. (2003). *Monitoring health by healthy active life expectancy–A user's guide*. University of Leicester and Trent Public Health Observatory.

Kramer, M. (1980). The rising pandemic of mental disorders and associated chronic diseases and disabilities. *Acta Psychiatrica Scandinavica*, *62* (Suppl. 285), 282–297.

Manton, K. G. (1982). Changing concepts of morbidity and mortality in the elderly population. *Milbank Memorial Fund Quarterly, Health and Society*, *60*, 183–244.

Manton, K. G., Gu, X., & Lamb, V. L. (2006). Long-term trends in life expectancy and active life expectancy in the United States. *Population and Development Review*, *32*(1), 81–105.

Robine, J. M., Jagger, C., Mathers, C. D., Crimmins, E. M., & Suzman, R. M. (2003). *Determining health expectancies*. Chichester, England: John Wiley.

ACTIVITIES OF DAILY LIVING

Definitions of activities of daily living (ADL) task categories vary in the literature, thus complicating assessment and treatment descriptions. Globally, such activities have been considered in two major categories: ADL and instrumental activities of daily living (IADL). The term ADL collectively describes performance tasks that involve the care of one's own body to maintain health and well-being (American Occupational Therapy Practice Framework, 2002). ADL are used to describe activities that meet the demands of everyday life that a person needs to perform to participate in social life, work roles, and live independently (Christiansen, Baum, & Bass-Haugen, 2005). These tasks may include feeding and eating, dressing, grooming, bathing and showering, toileting, toileting hygiene, sexual activity, functional mobility, personal-device care, bowel and bladder management, and sleep and rest.

IADL specifically refer to tasks that require an individual's involvement with the physical and/or social environment. These self-maintenance skills require interactions in the home and community. These tasks include home management, functional communication, safety, community-living skills, financial-management tasks, caring for others, child-rearing, meal preparation and cleanup, and shopping (AOTA Practice Framework, 2002; Crepeau, Cohn, & Schell, 2003). When assessing ADL and IADL performances, health care providers should carefully consider the diversity of terms, the impact on the older adult's performance, and overall safety. Both ADL and IADL serve as real-world demands that determine the individual's level of performance, independence, productivity, caregiving roles, and safety. Developing an operational terminology assists understanding among health care providers and clarifies ADL and IADL assessment outcomes and intervention concepts (Rogers & Holm, 2003).

ADL Assessment Measures

Methods of obtaining ADL and IADL information include self-report, measurement of task performance or independence, and determination of the quality of the performance. Qualitative and quantitative approaches may be used in ADL and IADL assessments. The health care provider's challenge is to use the most appropriate assessment tools that provide an objective description of outcomes that may result from ADL and IADL interventions (Christiansen, et al., 2005). Accepted measures of dependency vary internationally, with cultural and reimbursement-system differences.

The World Health Organization (WHO) developed a new classification system, the International Classification of Functioning, Disability and Health (ICF) to describe how people live with their respective health condition. The ICF serves as a classification system that describes health and health-related domains related to body functions and structures, activities, and participation. The ICF system also considers the body, individual, social, and environmental perspectives. The classification system is used to classify, understand, and measure health outcomes. The system, which is complementary to the International Classification of Diseases and Related Health Problems (ICD-10), guides the health care provider to look beyond mortality and disease to see the individual's needs. Chapter 5 of the ICF classification system focuses on Self-Care. Categories include washing oneself (d510), caring for body parts (d520), toileting (d530), dressing (d540), eating (d550), drinking (d560), looking after one's health (d570), self-care, other specified (d598), and self-care, unspecified (d599). The WHO ICF system has provided descriptions of each self-care task (http://www3.who.int/icf/onlinebrowser/icf.cfm?parentlevel=2&childlevel=3&itemslevel).

Health care providers selecting an ADL or IADL assessment tool should consider (1) comprehensiveness of the tool with respect to the ICF categories; (2) qualitative and quantitative measurements; (3) performance-based assessment and self-report flexibility; (4) use of assistive technology and adaptive devices; and (5) statistical significance of the assessment tool, such as reliability, validity, and sensitivity (Ottenbacher & Christiansen, 1997).

Other ADL and IADL assessment parameters describe levels of performance. The Centers for Medicare and Medicaid Services (CMS) defines independence in terms of the levels of assistance the client needs: "minimal assistance" constitutes 25% assistance, "moderate assistance" 50%, "maximal assistance" 75%, and "total assistance or dependence" 100% (http://www.cms.hhs.gov). Other definitions of independence may include ordinal scales. Safety, independence, and overall quality of task performance should be included in an ADL and IADL assessment. Performance measures may also consider the use of assistive technology and the non-physical assistance needed for task performance. A description of needed technology is important with regard to discharge safety and compliance.

Methods of Gathering Assessment Data

Assessing each ADL and IADL task involves a multiple-part process: analyzing the task to be performed, determining the learning capacity of the person, and determining the influence of the individual's environment. A three-point assessment of task, person, and environment allows for ADL and IADL measurements that determine whether the performance is a departure from normal tasks and roles.

Analysis of the performance capacity should include assessment of the level of performance needed to successfully complete a defined task. Information is also needed on how an ADL or IADL task is performed, when it is performed, the quality of performance, the amount of assistance needed, and the use of any assistive technology and devices.

A variety of assessment tools exists to measure the older adult's ADL and IADL performance, and health care providers should carefully match the operational ADL and IADL needs used with the most appropriate assessment approaches. Assessment includes critical reasoning and recognition of the performance setting or the individual's environment in which tasks are to be performed. ADL and IADL tasks that are self-performed may require the use of assistive technology, adaptive devices, or set-up support. Tasks that are performed independently but not safely may place the older adult at risk for additional disability. Task performance that is not of a quality acceptable to the older adult may lead to personal frustration, depression, role restriction, or diminished quality of life (http://www.cdc.gov/nchs/products/pubs/pubd/hestats/homhltpatients.htm).

All ADL and IADL assessment tools should consider the older adult's learning capacity, including the level of sensorimotor skills, functional mobility, safety, endurance, and judgment (Crepeau et al., 2003). Questions a health care provider should ask include the following: Can the individual older adult conceptualize or attend to the ADL or IADL task? Can the individual adapt to limitations in performance and learn new methods of ADL or IADL performance? Can the individual use assistive technology or devices to perform the ADL or IADL task? The older adult's ability to perform the task will direct the health care provider in selecting the most successful and cost-efficient level of intervention.

The environment in which the ADL or IADL task will be performed must be included in the assessment. Task and environmental performance should be matched to intervention strategies that reflect the older adult's actual living conditions. Teaching ADL and IADL tasks such as bathing in an enhanced therapeutic environment may not benefit an individual who returns home to an environment lacking the needed adaptations, equipment, or technology.

Intervention

ADL and IADL intervention strategies include restoring function and compensating or adapting for performance limitations (Christiansen et al., 2005; Ottenbacher & Christiansen, 1997). ADL or IADL interventions should include approaches to restore function, compensate for disability or impairments, and adapt for permanent inability to perform. ADL or IADL interventions involve establishing realistic goals based on consideration of the individual's and caregiver's needs, the demands of the task, and the environment. Intervention approaches that are relevant and medically necessary are available from a variety of health care providers, including occupational therapists, nurses, physical therapists, and trained caregivers. ADL and IADL interventions should consider the individual's ability to learn or relearn the needed tasks; the complexities of task performance within the individual's abilities; and the techniques, equipment, or technology needed. ADL and IADL interventions consider the value of the task to the individual, the level of performance, and overall safety. Assistive technology or devices may be used depending on input from the individual, the ability to use such equipment, financial resources, and the actual outcome obtained with technology or device usage. Treatment outcomes are determined by postintervention assessments that include discharge planning, safety assessments, and caregiver education. The ability to perform ADL and IADL tasks is critical to the older adult's level of independence, safety, and quality of life.

Kathy Pierce Bradley
Robert Mcalister

See also

Assistive Technology
Cognitive Changes in Aging

Occupational Therapy Assessment and Evaluation
Physical Therapy Services
Rehabilitation
Rheumatoid Arthritis
Stroke/Cerebral Vascular Accident

Internet Resources

American Occupational Therapy Association, Inc.
http://www.aota.org/

Assistive Technology
http://www.resna.org/resna/webres.htm

Centers for Medicare and Medicaid Systems
http://www.cms.hhs.gov

Evan Kemp Associates, Inc. (resource for disability and assistive technology information)
http://www.disability.com/

Measuring the Activities of Daily Living: Comparisons Across National Surveys
http://www.aspe.hhs.gov/daltcp/reports/meacmpes.htm

World Health Organization International Classification of Functioning, Disability and Health (ICF)
http://www3.who.int/icf/onlinebrowser/icf.cfm?parentlevel=2&childlevel=3&itemslevel

REFERENCES

AOTA (2002). Occupational therapy practice framework: Domain and process. *American Journal of Occupational Therapy*, *56*, 609–639.

Christiansen, C. H., Baum, C. M., & Bass-Haugen, J. B. (2005). *Occupational therapy: Performance, participation, and well-being*. Thorofare, NJ: SLACK, Inc.

Corcoran, M. A. (Ed.) (2003). *Geriatric issues in occupational therapy*. Bethesda, MD: American Occupational Therapy Press.

Crepeau, E. B., Cohn, S., & Schell, B. A. B. (Eds.) (2003). *Willard and Spackman's occupational therapy* (10th. ed.). Philadelphia: Lippincott Williams & Wilkins.

Ottenbacher, K. J., & Christiansen, C. (1997). Occupational performance assessment. In C. Christiansen & C. Baum (eds.), *Enabling function and well-being* (2nd ed., chap. 5). Thorofare, NJ: SLACK, Inc.

Rogers, J. C., & Holm, M. (2003). Activities of daily living and instrumental activities of daily living. In E. B. Crepeau, E. S. Cohn, & B. A. B. Schell (eds.), *Willard and Spackman's occupational therapy* (10th ed.). Philadelphia: LippincottWilliams & Wilkins.

ADULT DAY SERVICES

Adult day services (ADS) are community-based long-term-care group programs that provide elderly individuals and their caregivers with out-of-home support for part of the day. These programs give older adults an opportunity for socialization through peer support and supervised activities and may also offer specialized care services such as nursing, speech therapy, physical therapy, and counseling (Cohen-Mansfield, Besansky, Watson, & Bernhard, 1994). ADS providers work with elderly individuals to enhance and maintain their physical and mental functioning and well-being longer than if they were in an institutional setting (Kaye & Kirwin, 1990; Robert Wood Johnson Foundation, 2003). Another important function of ADS is to provide caregiver respite to prevent caregiver burnout and enhance family functioning. It allows caregivers time to work, run errands, or perform other tasks that might not be completed if they were supervising their elderly relatives.

Types of Programs

ADS programs vary but are usually one of three models: social, medical, or mixed. A social ADS program provides socialization, creative and educational activities, meals and nutritional monitoring, supervision by nursing or social work staff, and medication management in some programs. However, these programs usually offer little or no personal care. A medical ADS program, also referred to as an Adult Day Health Care (ADHC) program, is for individuals needing more intensive levels of personal and medical care. Typically, ADHC programs offer medical, nursing, and personal care as well as physical, occupational, and other forms of therapy. Participants at medical adult day centers require physician orders to receive medical treatment. The Program of All-Inclusive Care for the Elderly (PACE) is a well-known example of a medical ADS model. PACE uses multidisciplinary case-management teams and the delivery of services through adult day health facilities to assist nursing home–eligible older adults to remain in the community. A key aspect of PACE is the integration of a variety of funding sources, including Medicare and Medicaid capitation payments, to coordinate services that foster the health, well-being, and independence of program participants (Branch, Coulam, & Zimmerman, 1995; National PACE Association, 2006).

The mixed ADS model of care incorporates concepts and activities that fall under the social and medical models. Distinguishing between models is often difficult due to service variations. In addition to the three options, some programs focus on narrowly defined client populations. These population-specific adult day centers provide targeted services to individuals with unique health needs, such as persons with dementia or rehabilitation patients. Some adult day centers have intergenerational programming and joint activities with child day care or other community programs.

Policies and Standards

Although organizations like the National Adult Day Services Association (NADSA) and the Commission on Accreditation of Rehabilitation Facilities (CARF) have developed standards and guidelines for ADS programs, there are currently no mandatory national standards for such programs. Significant regulatory variations exist from state to state. Many states require a license to operate an adult day facility. Medicaid certification is required for programs using this funding source for reimbursement. The U.S. Department of Health and Human Services (HHS) Web site offers an updated overview of programs by state and geographic region.

Program Characteristics and Staffing

Regardless of the type of adult day program, services are usually offered up to 12 hours a day. A national survey of adult day centers found that programs are generally open 8 hours a day, Monday through Friday, with fewer than 17% of ADS providers offering weekend services (Robert Wood Johnson Foundation, 2003). A large majority of programs are nonprofit (78%) and operate under the purview of a larger parent organization (70%) such as a hospital, nursing home, or religious organization. Typically, an ADS program enrolls approximately 42 clients, with an average daily attendance of 25. About one-fifth of the programs reviewed have waiting lists. Most adult day centers (79%) offer transportation services to and from the program (Robert Wood Johnson Foundation, 2003). Conrad, Hanrahan, and Hughes (1990) found that approximately 55% of clients live within 30 minutes of their ADS facility and another 35% travel between 30 and 60 minutes to attend. Referrals to ADS come primarily from hospitals, visiting nurses, home health programs, and other human services programs. If adult day programs share facilities, they are usually located with nutrition sites, nursing homes, senior centers, or child-care centers (Conrad, Hanrahan, & Hughes, 1990).

Because there are no uniform requirements for ADS providers, staffing may vary significantly among programs. On average, adult day programs have a client-to-staff ratio of approximately eight to one (Robert Wood Johnson Foundation, 2003). Nursing services are usually performed by registered nurses. In medical programs, the nurses administer medications and manage and monitor the personal and medical care of clients as directed by an individual's physician. Licensed social workers direct social work services, offer caregiver support groups, and provide counseling to clients and caregivers. Their tasks may also include outreach, intake and assessment, advocacy, care management, crisis-intervention, and assistance with Medicaid applications (Johnson, Sakaris, Tripp, Vroman, & Wood, 2004). However, not all ADS programs have social workers on staff. Specialized therapies are provided by physical, occupational, and speech therapists. Social workers, nurses, recreational therapists, aides, or volunteers may be responsible for the social, creative, and educational activities of an ADS program.

The costs of ADS vary greatly, depending on the type of program and the services used. The two primary funding sources are Medicaid and participant fees. Program fees range from a few hundred dollars to well over $1,000 a month. ADS programs often receive substantial public and philanthropic support, thus helping to defray the costs to program participants. In fact, due in part to these supplemental funding sources, the average ADS participant fee is $10 less than the actual cost per participant (Robert Wood Johnson Foundation, 2003).

Access to Services

The first step in accessing ADS is to obtain the most current information about programs in the geographic area. Next, the practitioner and client should review the options and discuss which programs would best fit the client's needs: financial, nutritional, medical, and social support. In nonurban and rural areas, there might be few or no programs available. A visit to the program site should be planned before enrollment and, if possible, the practitioner should accompany the client and caregiver on this visit. If the client is looking at an ADHC program, it is helpful to speak with members of the medical staff and inquire about the appropriateness of the medical-care options. Other areas to inquire about are the social and recreational activities offered.

Although it is difficult to judge the quality of a program based on one visit, interactions between staff and program participants may be a good indicator of the facility's atmosphere. Many programs let potential clients spend some time and attend group activities to find out whether they like the program. Another area to appraise is the personnel. Do qualified personnel provide the services? What is the client–staff ratio? What is the overall condition and physical environment of the facility? Are there handrails, signs, and adequate lighting? Does the program offer or coordinate transportation services? Will program personnel come into the home to pick up clients? Once a decision is made, the client may need assistance completing the application. An important role for the practitioner in this context is to review and educate the client about the contractual terms of the adult day center.

Recommendations

Research indicates continued gaps in the availability and utilization of ADS. These gaps in service delivery are influenced by program costs, inadequate funding, transportation availability, the "goodness of fit" between services and client needs, and client refusal (Cohen-Mansfield et al., 1994; Robert Wood Johnson Foundation, 2003). Suggestions to increase availability and utilization include increased public awareness, improved transportation, provision of more counseling services, and establishment of quality-of-care standards (Conrad et al., 1990; Kaye & Kirwin, 1990; Robert Wood Johnson Foundation, 2003). As with other services, cultural differences exist in the way older adults access and utilize ADS programs. The heavy reliance on participant fees may pose a financial barrier to use by older adults from lower economic backgrounds. Thus, additional emphasis should be placed on evaluating service utilization and potential access barriers for individuals from different cultural and economic backgrounds.

MATTHIAS J. NALEPPA
JOHN G. CAGLE

See also

Caregiver Burden
Caregiver Burnout
Program of All-Inclusive Care for the Elderly (PACE)

Internet Resources

Child and Elder Care Directory
http://www.careguide.com

Commission on Accreditation of Rehabilitation Facilities (CARF)
http://www.carf.org

HHS—Regulatory Review of Adult Day Services: Final Report http://www.aspe.hhs.gov/daltcp/reports/adultday.htm

National Adult Day Services Association (NADSA) http://www.nadsa.org

REFERENCES

Branch, L. G., Coulam, R. F., & Zimmerman, Y. A. (1995). The PACE evaluation: Initial findings. *The Gerontologist*, *35*, 349–359.

Cohen-Mansfield, J., Besansky, J., Watson, V., & Bernhard, L. J. (1994). Underutilization of adult day care: An exploratory study. *Journal of Gerontological Social Work*, *22*, 21–39.

Conrad, K. J., Hanrahan, P., & Hughes, S. L. (1990). Survey of adult day care in the United States: National and regional findings. *Research on Aging*, *12*, 21–39.

Johnson, J., Sakaris, J., Tripp, D., Vroman, K., & Wood, S. (2004). The role of social work in adult day services. *Journal of Social Work in Long Term Care*, *3*(1), 3–13.

Kaye, L. W., & Kirwin, P. M. (1990). Adult day care services for the elderly and their families: Lessons from the Pennsylvania experience. *Journal of Gerontological Social Work*, *15*, 167–183.

National PACE Association (2006). About us. Available at http://www.npaonline.org

Robert Wood Johnson Foundation (2003). Adult day services report. Available at http://www.rwjf.org

ADULT FOSTER CARE HOMES

Since the 1980s, alternative housing options for elders have proliferated in the United States. Known by a variety of terms, these alternative settings provide varying degrees of assistance to the older individual. The geriatric adult foster care (AFC) home, also known as a board and care facility or group home, is the oldest form of alternative living arrangement. An AFC provides needed support services while allowing the older adult to remain in the community (Quinn et al., 1999). In the United States, regional variations exist regarding regulation and licensure, and AFCs may be under the jurisdiction of none to several state agencies. Even in states that require licensing, variation exists in the minimum standards, delegated responsibility, and degree of enforcement (Perkins et al., 2004). Because most AFCs are private residences, it is unknown how many AFCs there are currently in the United States, although some estimates are as high as 30,000 facilities.

In general, an AFC home is a private home that is residentially zoned with an unrelated, live-in caregiver. Typically, AFCs limit the number of residents to no more than five individuals, although larger AFCs exist. Often, an additional state requirement is that only one resident may be bedbound or require maximum assistance with care. The AFC may provide a private bedroom with access to a bathroom on the same floor as the bedroom; however, this environmental characteristic is not always present. Varying by state, the AFC may accept private payment, Medicaid, or both.

Facilities and Caregivers

A live-in caregiver is the basic service requirement of AFCs, regardless of geographic location. AFCs provide a wide range of services, somewhat dependent on whether the AFC is associated with a medical center or social services agency. Although all AFCs have a formal caregiver who can provide personal care services, AFC caregivers may also supervise medications, including injections; provide special diets, including tube feedings; and provide bladder training, catheter irrigations, and dressing changes.

Formal training of caregivers varies. Reporting on foster homes, Kane and colleagues (1991) and Sherwood and Morris (1983) found that the majority of caregivers in Oregon and Pennsylvania had no formal training. Other investigators found that foster home caregivers who participated in programs linked to medical centers received formal training of up to 40 hours (Oktay & Volland, 1987). Formal training included acquiring skills and knowledge related to personal assistance, home health care, special diets, physical therapy, and psychosocial aspects of aging and illness. Additionally, some authors suggest that the need for formal training and knowledge of personal care assistance by caregivers is needed because the residents in AFCs may be more frail than earlier populations (Quinn et al., 1999).

Physical, environmental, and social characteristics of a facility are important to older adults. Surveys of older adults from Oregon nursing homes and AFCs revealed that characteristics influencing their choice of an AFC were homelike atmosphere, privacy, and flexibility in routines, whereas organized activities and the availability of physical rehabilitation were important to those who chose nursing homes (Nyman et al., 1997; Reinardy & Kane, 1999).

Residents

Most older adults in AFCs are typically older than 55 years, with reported mean ages greater than 70 years. Unlike residents who reside in assisted-living facilities, who are generally retired middle-class professionals, AFC tenants are more likely to be poor, single, living alone, often rejected by family members, and lacking social support resources (Oktay & Volland, 1987; Perkins et al., 2004).

AFC tenants have fewer reported major health problems compared to nursing-home residents, but this finding may reflect a reporting bias because nursing-home personnel are more likely to have current medical histories of their residents (Kane et al., 1991). Despite fewer reported health problems among those residing in AFCs, difficulties with managing activities of daily living (ADL) and instrumental activities of daily living (IADL) do exist. AFC residents requiring assistance with ADL range from 9% to 78% requiring assistance with walking, 4% to 58% requiring assistance with transferring, 12% to 27% requiring assistance with dressing, 30% to 51% requiring assistance with bathing, 4% to 7% requiring assistance with eating, and 5% to 70% requiring assistance with toileting (Hopp, 1999; Kane et al., 1991; Quinn et al., 1999). The broad ranges in ADL dependency reflect the existence of a subpopulation in AFCs that is very dependent. Although a higher proportion of AFC residents than nursing-home residents are independent in ADL and IADL, these findings demonstrate that significant overlap occurs between the two populations in degree of dependency in ADL and IADL. Not surprisingly, AFC residents are more likely to require assistance with IADL than with ADL. It is not unusual for residents of AFCs to have cognitive and/or behavioral deficits.

Little is known regarding the health outcomes of older adults residing in AFCs. AFCs affiliated with a medical center and formal caregiver training report improved patient well-being, decreased anxiety, improvement in ADL function, and decreased cost of services as compared to patient outcomes in nursing homes (Oktay & Volland, 1987). In contrast, AFCs lacking affiliation with a medical center report little or no improvement in ADL function (Kane et al., 1991; Sherwood & Morris, 1983). Overall, 49% of AFC residents have increased ADL dependency within the first year of admission. Increasing personal care needs influenced whether residents could remain in an AFC. Other factors influencing continued AFC residency included whether the resident was “likable” and able to participate in the home, social functions such as meals, family support, staff trained to provide services, and caregivers who felt that the needed care could be provided. AFC characteristics other than caregiver training associated with positive outcomes included children residing in the AFC, caregivers who involved the older adults in activities, and caregivers who rated the work as satisfying but rated their need to work in the home as somewhat important.

Choosing an Adult Foster Care Home

Older adults and/or family members of older adults who are in need of alternative living arrangements and who are considering an AFC home need to examine characteristics of the home and the caregiver. If the AFC home is certified or licensed by the state, a potential tenant should review the last survey report, making note of any deficiencies. Safety and physical considerations include safe entry and exit ways, well-lighted entry and parking areas, wheelchair access, maintenance of grounds and building, presence of safety features such as smoke detectors and handrails, and whether a private bedroom is available. The environment should be clean and free of odors with good ventilation and comfortable temperatures. Whereas most AFCs are in residential neighborhoods, the AFC should be easily accessible to family and friends and near the resident's doctor or hospital.

Financial considerations are important because not all AFCs accept Medicaid payments. Families need to determine if there is a basic fee that covers all services or if additional fees are included for services such as laundry or amenities such as telephone or cable television. If a contract is signed, families need to know under what circumstances they may terminate the contract—for example, if there is a change in the resident's medical condition. Minimal caregiver training should include first aid skills, safety and fire prevention, and prevention and containment of communicable diseases.

An aging population and longer life expectancy will increase demand for alternative housing care environments and for caregivers able to provide services to individuals with varying degrees of functional and cognitive impairments and psychosocial needs. Issues for future research include the lack of knowledge and formal training of caregivers, the numerous terms and lack of a standardized definition of AFC that includes services provided, and the lack of federal regulations.

BARBARA L. HALLIDAY
LORRAINE C. MION

See also

Assisted Living
Consumer-Directed Care
Continuing Care Retirement Communities
Institutionalization
Naturally Occurring Retirement Communities (NORCs)
Nursing Homes
PACE

Internet Resources

AARP Research/Adult Foster Care for the Elderly
http://www.research.aarp.org

Assisted Living Network
http://www.alfnet.com

Health Care of Michigan (resource guide for AFC homes)
http://www.hcam.org

REFERENCES

Hopp, F. (1999). Patterns and predictors of formal and informal care among elderly persons living in board and care homes. *The Gerontologist*, *39*(2), 167–176.

Kane, R. A., Kane, R. L., Illston, L., Nyman, J., & Finch, M. (1991). Adult foster care for the elderly in Oregon: A mainstream alternative to nursing homes? *American Journal of Public Health*, *81*(9), 1113–1120.

Nyman, J., Finch, M., Kane, R. A., Kane, R. L., & Illston, L. (1997). The substitutability of adult foster care for nursing home care in Oregon. *Medical Care*, *35* (8), 801–813.

Oktay, J., & Volland, P. (1987). Foster home care for the frail elderly as an alternative to nursing home care: An experimental evaluation. *American Journal of Public Health*, *77*(12), 1505–1510.

Perkins, M., Ball, M., Whittington, F., & Combs, B. (2004). Managing the care needs of low-income board-and-care home residents: A process of negotiating risks. *Qualitative Health Research*, *14*(4), 478–495.

Quinn, M. E., Johnson, M. A., Andress, E. L., McGinnis, P., & Ramesh, M. (1999). Health characteristics of elderly personal care home residents. *Journal of Advanced Nursing*, *30*(2), 410–417.

Reinardy, J., & Kane, R, A. (1999). Choosing an adult foster home or a nursing home: Residents' perceptions about decision making and control. *Social Work*, *44*(6), 571–585.

Sherwood, S., & Morris, J. (1983). The Pennsylvania domiciliary care experiment: Impact on quality of life, part 1. *American Journal Public Health*, *73*(6), 646–653.

ADULT PROTECTIVE SERVICES

Adult protective services are the primary programs responsible for the identification and treatment of mistreated vulnerable and older adults. Reports of physical abuse, sexual abuse, emotional or psychological abuse, caregiver neglect, abandonment, financial or material exploitation, and self-neglect are made to adult protective service units, which are housed in state or local departments of social services or aging services. Because identification and reporting of elder abuse are crucial in initiating treatment, family members, caregivers, professionals, and victims need to be familiar with reporting laws in their states, as well as which agencies receive these reports (see National Adult Protective Services Association [NAPSA] Web site).

A recent national study documenting the number of reports of abuse, exploitation, and neglect made to state adult protective service programs found that of a total of 565,757 reports made to all 50 states, the District of Columbia, and Guam, 32 states indicated that they had received 253,426 reports on persons age 60 and older (Teaster, 2006). Currently, there are no federal statutes or guidelines for the delivery of adult protective services (Breaux & Hatch, 2002). Each state has some form of legislation addressing protective services for vulnerable adults and/or elderly victims, but statutes vary widely. To know when, where, and what to report to whom, familiarity with a state's adult protective services laws is essential. A listing of state adult protective services statutes is on the National Center for Elder Abuse Web site.

Elder mistreatment is a hidden problem. Often, victims are reluctant to self-report due to shame, fear, or the physical or mental inability to do so. In most states, a variety of professionals, including physicians, health care professionals, law enforcement officers, social workers, staff in long-term-care facilities, and mental health professionals, is required to report. Many state statutes include protections for good-faith reporting as well as penalties for failure to report.

Most reports of elder/vulnerable-adult abuse are made to adult protective services by telephone. Reports are first screened to determine whether the victim fits the target population defined in the statute as well as whether the reported type of mistreatment is covered by state law. For example, in many states, younger disabled victims as well as the elderly qualify for adult protective services based on their vulnerability to abuse. State definitions of the various forms of abuse also vary.

If the victim is eligible for adult protective services, a caseworker conducts an investigation, assesses the immediate risk to the victim, and takes action to prevent further mistreatment. However, victims who have the legal capacity to make informed decisions regarding their situations have the right to refuse any and all services that are offered.

Any occurrence of domestic elder mistreatment that appears to involve criminal activity, including physical and sexual assault, armed robbery, theft, or criminal neglect, should be reported immediately to the local law enforcement agency. This includes crimes that are committed against residents in long-term-care facilities. Adult protective services professionals have neither the expertise nor the statutory authority to conduct criminal investigations, although they may provide assistance to victims during the criminal investigation process.

Situations of elder mistreatment in long-term-care facilities should be reported to the facility administrator, the state or local regulatory agency, the long-term-care ombudsman, and, in some states, to adult protective services as well. When there are multiple agencies involved in an abuse investigation, clarification of roles and responsibilities is essential.

Certain basic principles guide the delivery of adult protective services. They include the follow ing:

> Every action taken by Adult Protective Services must balance the duty to protect the safety of the vulnerable adult with the adult's right to self-determination.
>
> Older people and people with disabilities who are victims of abuse, exploitation or neglect should be treated with honesty, caring and respect.
>
> Adults have the right to be safe.
>
> Adults retain all their civil and constitutional rights unless some of these rights have been restricted by court action.
>
> Adults have the right to make decisions that do not conform with societal norms as long as these decisions do not harm others.
>
> Adults are presumed to have decision-making capacity unless a court adjudicates otherwise.

> Adults have the right to accept or refuse services.
> (NAPSA, 2004)

Based on these principles and the assessment of risk, as well as available community resources, the adult protective services professional develops a case plan. An essential component of the case-planning process is the victim's understanding of the situation and willingness to accept services designed to reduce or eliminate further mistreatment. The ongoing casework relationship provides essential emotional support to the victim. Once services have been initiated, the adult protective services professional may monitor the service delivery or turn over that responsibility to an ongoing case manager.

Prevention of the mistreatment of older persons is highly dependent on individual and community awareness. Although many older people may fear becoming victims of violent crime, few crimes are committed by strangers against the elderly. Mistreatment is most likely to be committed by a family member, usually an adult child or a spouse. Two-thirds of the perpetrators of domestic elder mistreatment are family members.

For this reason, awareness of the types of abuse and the probability of their occurrence is the primary method of prevention. Older persons should be aware of and take responsibility for disease prevention and management of their medical conditions, as well as thoughtful financial planning designed to protect their assets. They need to prepare for the time when they will no longer be able to live independently by developing a plan of care and clearly designating decision-making authority to persons who will act in their best interests if they lose the capacity to make informed decisions.

JOANNE MARLATT OTTO

See also

Crime Victimization
Elder Mistreatment: Overview
Elder Neglect
Financial Abuse
Institutional Mistreatment: Abuse and Neglect
Money Management
Self-Neglect

Internet Resources

The National Adult Protective Services Association (NAPSA)
http://www.apsnetwork.org

National Center on Elder Abuse
http://www.elderabusecenter.org

National Committee for the Prevention of Elder Abuse
http://www.preventelderabuse.org

REFERENCES

Breaux, J., & Hatch, O. (2002). The Elder Justice Act, S. 333. *Journal of Elder Abuse & Neglect*, *14*(2/3), 1–6.

National Adult Protective Services Association (2004). *Ethical principles and best practice guidelines*. Boulder, CO.

Teaster, P. B. (2006). *The 2004 survey of state adult protective services: Abuse of adults 60 years of age and older*. Washington, DC: National Center on Elder Abuse.

ADVANCE DIRECTIVES

Older persons, as well as their families and health care professionals, often face difficult decisions and conflicts regarding starting, continuing, or stopping life-sustaining medical treatments (LSMTs). The situation is especially complex when providers and families have little knowledge of which LSMTs a patient would want or when no one has been appointed (or is presently available) to make health care decisions for an incapacitated patient. Advance health care planning, although certainly not a panacea for difficulties that may arise in this arena (Hardin & Yusufaly, 2004), helps maintain some degree of control over future medical treatment when a person becomes physically and/or mentally unable to make and express important LSMT decisions. Proponents of advance planning also argue that it may help individuals and their families avoid court involvement in LSMT decisions, conserve limited health care resources in a way that is consistent with patient self-determination, and reduce emotional stress on families in crisis circumstances.

Although an advance directive (AD) may be oral, it is much more likely to be followed if it is a written document. An instruction (living will)–type AD contains an individual's instructions about wanted, limited, or unwanted LSMTs in case a person becomes incapacitated or is unable to communicate. These instructions may be detailed (e.g., relate to specific medical treatments in specific situations), general (e.g., "no extraordinary measures"), or phrased in terms of a patient's personal values (e.g., "keep me alive forever no matter what pain or expense" or "avoiding suffering is my main concern").

By contrast, a proxy directive (usually a durable power of attorney [DPOA]) is an AD that permits an individual to designate another person—called a health care agent, surrogate, proxy, or attorney-in-fact—to make health care decisions if the principal (i.e., the person who delegates away decision-making authority) loses decision-making capacity. In states that have so-called family consent laws (i.e., statutes that designate a legal hierarchy of family members and others who may make decisions on behalf of incapacitated patients when there is no guardian appointed or instruction directive present), a DPOA can clarify which person has authority to decide when two persons have equal status (e.g., siblings) in the hierarchy. Additionally, a DPOA is very valuable when a person prefers a nonrelative as the future decision maker. For example, in the gay community, it is common for individuals to appoint a domestic partner or friend rather than a family member as the health care agent. Some AD documents combine the instruction and proxy elements.

Only a presently capable person may execute a valid AD. The AD becomes effective only when that individual subsequently lacks decision-making capacity regarding a particular medical-treatment issue. Various states have enacted detailed statutes that outline the conditions under which an AD is legally valid. In practice, however, health care providers are often unclear about when a living will applies and are uncomfortable about deciding when a patient is on a dying trajectory that warrants triggering a living will's instructions. Furthermore, health care providers sometimes find a living will's directions either too broad or too narrow to provide useful guidance in a particular situation. Thus, appointing a proxy with power to make medical choices in the present, based on up-to-date information, may be more useful.

The Patient Self-Determination Act (PSDA) became effective in 1991. The PSDA mandates that hospitals, nursing homes, home health agencies, hospices, health maintenance organizations, and preferred provider organizations participating in Medicare or Medicaid (1) provide written information to individuals about their right to participate in medical decision making as provided in applicable state law; (2) ask patients whether they have completed an AD already and, if the answer is affirmative, have a system for recoding the patient's AD; (3) offer decisionally capable residents an opportunity to execute an AD if the document does not already exist; (4) not discriminate in the provision of care based on the presence or absence of an AD; (5) have a system to comply with applicable state laws on medical decision making; and (6) educate staff and the community about medical decision-making rights.

Despite substantial public attention, psychological resistance to the contemplation of illness and death, coupled with inertia and legal complexities complicating the execution of an AD, keeps the rate of AD completion low among the general public (Lo & Steinbrook, 2004). Personal characteristics may influence AD completion rates among members of different population groups (Kahana, Dan, Kahana, & Kercher, 2004). Although nursing-home residents are more likely to complete an AD than community-dwelling older persons (Osman & Becker, 2004), the PSDA expressly forbids any health care provider from requiring a patient/resident to execute an AD as a condition of admission or receiving services.

Health care providers should attempt to discuss end-of-life preferences and complete ADs with older individuals. Many older persons want to talk about end-of-life care and are willing to fill out an

AD if given the opportunity (Pearlman, Starks, Cain, & Cole, 2005). Discussions may focus on specific LSMTs and/or on an individual's remaining life and health care goals and priorities. Although physicians should be centrally involved in the communication process (Gillick, 2004), the active participation of nurses, physician assistants, and social workers in this context may also be highly valuable.

Timing of communication about end-of-life care is key. Discussions ideally should occur in advance of a medical crisis, during regularly scheduled appointments with primary care providers (Wissow et al., 2004) or at the time of elective procedures. Older individuals sometimes pay more attention to written AD material when physicians or health care institutions mail them to their home. Periodically, and following significant health events, health care providers should review with patients who retain decision-making capacity in their AD to ascertain the accuracy of their listed preferences and other information. Patients should be advised to give copies of the AD to their designated health care agents, family members, and close friends, as well as making sure the primary care provider has a copy in the medical records, thus assuring easy accessibility in an emergency. In emergency situations outside of health care institutions (e.g., a cardiac arrest in the patient's own home), emergency medical service providers may not recognize and follow an AD unless it takes the form of a physician's order made in conformity with the state's applicable out-of-institution treatment statute.

No person, whether living in the community or temporarily or permanently being cared for in an institution, is legally or ethically required to execute an AD. Individuals (and their families) should be informed—and providers must understand—that the person will not be abandoned, ignored, or otherwise discriminated against regarding treatment because of failure to execute an AD.

As noted previously, an AD in written form is preferable. However, courts have recognized the validity of oral directives, and no health care provider has been found legally liable for following the wishes expressed in a patient's oral AD. An oral AD is most likely to be effective in directing future medical decisions when it is clear, consistent, and repeated on multiple serious occasions. Health care providers should fully document any conversations they have with patients regarding an AD or LSMT wishes.

MARSHALL B. KAPP

See also

Palliative Care
Substitute Decision Making

Internet Sources

American Bar Association Commission on Law and Aging
http://www.abanet.org/aging

Caring Connections (National Hospice and Palliative Care Organization)
http://www.caringinfo.org

Uniform Power of Attorney Act (Draft)
http://www.law.upenn.edu/bll/ulc/ulc_frame.htm

REFERENCES

Gillick, M. R. (2004). Advance care planning. *New England Journal of Medicine*, *350*, 7–8.

Hardin, S. B., & Yusufaly, Y. A. (2004). Difficult end-of-life treatment decisions: Do other factors trump advance directives? *Archives Internal Medicine*, *164*, 1531–1533.

Kahana, B., Dan, A., Kahana, E., & Kercher, K. (2004). The personal and social context of planning for end-of-life care. *Journal of the American Geriatrics Society*, *52*, 1163–1167.

Lo, B., & Steinbrook, R. (2004). Resuscitating advance directives. *Archives of Internal Medicine*, *164*, 1501–1506.

Osman, H., & Becker, M. A. (2004). Complexity of decision-making in a nursing home: The impact of advance directives. *Journal of Gerontological Social Work*, *42*, 27–40.

Pearlman, R. A., Starks, H., Cain, K. C., & Cole, W. G. (2005). Improvements in advance care planning in the Veterans Affairs system. *Archives of Internal Medicine*, *165*, 667–674.

Wissow, L. S., Belote, A., Kramer, W., Compton-Phillips, A., Kritzler, R., & Weiner, J. P. (2004). Promoting advance directives among elderly primary care patients. *Journal of General Internal Medicine*, *19*, 944–951.

ADVANCED PRACTICE NURSING

Advanced practice nurses (APNs) are registered nurses who have completed a master's degree program in nursing. Their graduate education builds on a strong foundation in nursing and prepares them for the role of nurse practitioner, clinical nurse specialist, nurse midwife, or nurse anesthetist.

Geriatric APNs are geriatric nurse practitioners (GNPs), geriatric nurse clinical specialists (GNCSs), and geropsychiatric nurse clinicians (GNCs) who have completed a master's degree program with a specialization in geriatric nursing. First introduced in the mid-1970s to help address a physician shortage, geriatric APNs blend the skills of an experienced nurse with those of a geriatric primary care provider. They promote the health of older adults, diagnose and manage acute and chronic illnesses and syndromes common in older adults, provide primary care and disease management, and educate patients and families in collaboration with other nursing and health personnel. GNPs can also prescribe and manage medications in every state and the District of Columbia (DC), and in 13 states and DC they have prescriptive authority (including controlled substances) independent of any physician involvement. In addition, in 26 states and DC, GNPs can practice independently without physician collaboration or supervision (Phillips, 2006).

Geriatric APNs work in ambulatory settings and clinics, home care agencies, assisted living facilities, hospitals, and nursing homes. They are eligible for reimbursement under Medicare and Medicaid (Omnibus Reconciliation Act of 1997). The reimbursement rate under Medicare is 85% of the rate for comparable physician services. In rural health settings, geriatric APNs are reimbursed through the Federal Rural Health Act (Sullivan-Marx & Keepnews, 2003).

There is strong scientific evidence that geriatric APNs improve the quality of care and decrease the cost of care in long-term facilities, hospitals, and ambulatory care settings (Stillman & Strumpf, 2003). Numerous evaluations confirm that nurses with advanced preparation in the care of elderly nursing home residents decrease unnecessary hospitalizations and the use of emergency rooms. APNs improve admission and ongoing patient assessments, provide better illness prevention and case finding, decrease incontinence, lower the use of psychotropic medications and physical restraints, and generally improve the overall management of chronic and acute health problems. Most of this improvement occurs without incurring additional costs and, in some instances, at reduced costs. These outcomes are in large part attributable to the enhanced teaching and supervision of professional and nonprofessional nursing staff and the decentralization of nursing services, which moves decision making down to the level of the bedside (Rosenfeld et al., 2004). Geriatric APNs have been shown to ameliorate the most common problems experienced by nursing-home residents: urinary incontinence, pressure ulcers, the overuse of physical restraints, and hard-to-manage behavior evidenced by residents with dementia (Intrator et al., 2005; Stillman & Strumpf, 2003).

In hospitals, geriatric clinical nurse experts have been found to (1) significantly reduce morbidity, including preventing or reducing clinical syndromes common to the elderly, such as delirium; (2) shorten hospital length of stay; (3) reduce morbidity following discharge; and (4) reduce emergency-room use and readmission after discharge (Mezey et al., 2004, 2005). These outcomes are evident throughout several hospital-based geriatric nurse practice models. The geriatric resource nurse model is designed to improve care by helping the primary bedside nurse develop enhanced skills and knowledge in geriatric nursing. Geriatric assessment and acute care of the elderly (ACE) units redesign the physical environment and use collaborative team decision making. In a transition model, a geriatric APN serves as first contact to an elderly patient on admission, follows the patient and family through the hospital stay, and then serves as the patient's home health nurse during the first 4 weeks after discharge (Naylor et al., 2004).

In ambulatory settings, geriatric APNs have been shown to improve care in Veterans Health

Administration facilities, private physicians' offices, and continuing care retirement communities. Positive outcomes have also been reported from geriatric nurse specialty practices that address the common problems afflicting older people living in the community, such as practices used to assess and treat elderly patients with urinary incontinence, elder abuse, and stroke. Early evidence of the efficacy of GNPs in home care, movements toward capitated home-care payments, and Medicare reimbursement for APNs has led to the increasing utilization of APNs to deliver primary care to elderly home-bound patients. GNPs have also been integral providers in mature capitated model programs for the frail elderly, such as Program for All-Inclusive Care of the Elderly (PACE) projects, Social Health Maintenance Organizations (SHMOs), and programs that encourage home-care agencies to offer managed-care options (Boltz, Harrington, & Kluger, 2005).

One of the major health care challenges of the 21st century will be the provision of quality, comprehensive, cost-effective care for a rapidly increasing number of older adults. The elderly population in the United States is expected to double, if not triple, by 2030, with the greatest growth in those 80 years of age and older. The prevalence of chronic illness and disability, especially in those over the age of 85, is expected to skyrocket (Administration on Aging, 2003). Health care costs are expected to escalate at a rate not seen before. Despite the recent increased emphasis on gerontology in medical and nursing curriculum, the emergence of specialized-care units in hospitals, and the development of alternative long-term-care options, the demand will still overwhelm the supply of qualified providers.

Geriatric APNs can and should be part of the plan to address this challenge. However, decreasing enrollments in geriatric APN programs have led to many closures. In addition, current nongeriatric APN programs contain insufficient geriatric content to prepare a workforce able to provide the type of care needed by this population. In response to all of these factors, a number of initiatives are underway with the primary goal of providing nongeriatric APNs with resources that will enable them to meet this challenge. There is a national trend toward dual-major APN programs in which geriatrics is combined with another specialty, such as adult or family nurse practitioner. In addition, there is a national effort focused on increased integration of geriatric content into nongeriatric APN programs. Development of Web-based educational resources for practicing APNs is ongoing.

Carolyn Auerhahn
Mathy D. Mezey

See also

Geriatric Evaluation and Management Units
Geriatric Interdisciplinary Team Training (GITT)

Internet Resources

Administration on Aging
http://www.aoa.gov/

Gerontological Nursing Interventions Research Center
htttp://www.nursing.uiowa.edu/gnirc/index

The John A. Hartford Foundation Institute for Geriatric Nursing
http:www.hartfordign.org

National Association of Geriatric Education Centers
http://www.hcoa.org/nagec/

National Conference of the Gerontological Nurse Practitioners (NCGNP)
http://www.ncgnp.org/

Nurses Improving Care for Health System Elders (NICHE)
http://www.hartfordign.org/programs/niche/index.html

Nurse Competence in Aging Project
http://www.geronurseonline.org

REFERENCES

Boltz, M., Harrington, C., & Kluger, M. (2005). Nursing counts. *American Journal of Nursing*, *105*(5), 101–102.

Intrator, O., Feng, Z., Mor, V., Gifford, D., Bourbonierre, M., & Zinn, J. (2005). The availability of nurse practitioners and physician assistants in nursing homes. *The Gerontologist*, *45*(4), 486–495.

Mezey, M., Kobayashi, M., Grossman, S., Firpo, A., Fulmer, T., & Mitty, E. (2004). Nurses improving care to health system elders (NICHE): Implementation of best practice models. *Journal of Nursing Administration*, *34*(10), 451–457.

Mezey, M., Boltz, M., Esterson, J., & Mitty, E. (2005). Evolving models of geriatric nursing care. *Geriatric Nursing*, *26*(1), 11–15.

Naylor, M. D., Brooten, D. A., Campbell, R. L., Mai, G. M., McCauley, K. M., & Schwartz, J. S. (2004). Transitional care of older adults hospitalized with heart failure: A randomized clinical trial. *Journal of the American Geriatrics Society*, *52*(5), 675–684.

Phillips, S. J. (2006). A comprehensive look at the legislative issues affecting advanced nursing practice. *The Nurse Practitioner*, *31*(1), 6–8, 11–17, 21–28.

Rosenfeld, P., Kobayashi, M., Barber, P., & Mezey, M. (2004). Utilization of nurse practitioners in long-term care: Findings and implications of a national survey. *Journal of the American Medical Directors Association*, *5*(1), 9–15.

Stilman, D., & Strumpf, N. E. (2003). Meeting the needs of older adults for primary care. In M. D. Mezey, D. O. McGivern, & E. Sullivan-Marx (Eds.), *Nurse Practitioners: Evolution of Advanced Practice* (4th ed., pp. 192–214). New York: Springer.

Sullivan-Marx, E. M., & Keepnews, D. (2003). Systems of payment for advanced practice nurses. In M. D. Mezey, D. O. McGivern, & E. Sullivan-Marx (Eds.), *Nurse Practitioners* (4th ed., pp. 391–414). New York: Springer.

AFRICAN AMERICANS AND HEALTH CARE

Nationwide Recognition of Health Care Disparities

Disparities in the quality of health care delivered to racial and ethnic minorities have been overwhelmingly confirmed by numerous studies (Institute of Medicine of the National Academies [IOM], 2005). Minorities with cardiovascular diseases, for instance, were less likely to undergo bypass surgery or to receive cardiac medications. Appropriate diagnostic cancer-detecting tests were less frequently ordered, and less desirable procedures, such as lower-limb amputations for diabetes, were more frequently performed (IOM, 2005). The high rate of cardiovascular disease, hypertension, diabetes, and other related health problems contribute significantly to the high death rate among African American elderly (LeRoy, 1997).

Important steps in addressing this grave problem and in moving toward a more equitable health care delivery system include (1) heightening awareness that significant racial and ethnic disparities exist (IOM, 2005); (2) examining ethnic-specific areas of medical concern; (3) identifying and eliminating barriers to service utilization; and (4) ultimately, improving service delivery to African American elderly and other underserved populations.

Ethnic-Specific Medical Concerns

Recent decades have witnessed a decline in the overall death rates for persons older than age 65. Yet, despite this overall decline, racial and ethnic disparities in both health status and mortality rates persist (DHHS, 2003). The aging African American population is three times as poor and considerably more prone to chronic, debilitating physical illnesses than White elderly. Multiple reasons and circumstances intertwine to cause this disturbing reality. They include socioeconomic status, insurance status, education levels, cultural beliefs, dietary preferences, social and structural inequities, stereotypical assumptions among health care professionals, and barriers encountered when attempting to access health care systems (DHHS, 2003).

General nutrition deficits are significant contributors to a number of chronic diseases, such as hypertension, cardiovascular disease, and diabetes, seen in the African American elderly population. For example, approximately 30% of cancer deaths may be nutritionally related. These, as well as other health management concerns, have an impact on the numbers and levels of chronic illness in the aging minority population (LeRoy, 1997).

Barriers to Service Utilization

The double-jeopardy circumstance of racism and ageism and the related inequitable economic, educational, political, and social conditions have resulted in a lifetime tainted by poverty and multiple disadvantages for many African American elderly (Baker, 2002). Consequently, whereas the need for adequate access to health care is great, low service utilization and limited awareness and access to services in the African American elderly community are well documented (Bonner, Ferrans, Moore-Burke, & Gorelick, 2005). Limited access to medical services, the absence of physicians in impoverished communities, lack of health care insurance, lack of health promotion and disease-prevention services all contribute to the complex and deficient system of service delivery to this vulnerable population. Formal health services may not be perceived as accessible or as user-friendly to some. Additionally, services that are perceived by one group as advantageous and beneficial may not hold the same value to another group with another frame of reference, a different value system, and different life experiences. For example, despite the intended benefits of advance directives (i.e., the Living Will and Durable Power of Attorney for Health Care), which allow individuals to document their wishes in writing if they become incapacitated and unable to voice their medical treatment preferences, research shows that their use, particularly by people of color, is very limited (Baker, 2002). This may point to the reluctance of ethnic groups, particularly African American elderly, to trust that representatives of health care and social service systems will carry out their documented wishes.

Recent research (Bonner et al., 2005) identified determinants of trust and mistrust as perceived by African American caregivers in an urban setting. Their findings indicated that high among the determinants of mistrust was the caregiver's perception of the physician not having the patient's best interest at heart. Historical discriminatory events, such as the infamous Tuskegee syphilis study, in which African Americans were allowed to develop progressive syphilis even though effective treatment was available (Gamble, 2002), have left indelible elements of distrust in the psyche of some African Americans, particularly the elderly. These and other historical realities, over the decades, have contributed to a general mistrust in the health care system (Bonner et al., 2005) and reluctance by some aging African Americans to utilize needed services. All of this makes overall intervention and management of quality health and mental health care delivery a challenge for gerontology practitioners.

Improving Service Delivery

Effective service delivery to aging African Americans may also be impeded by health care professionals' lack of awareness for the need for enhanced cultural competency training. Professionals serving African American elderly must understand the manner in which sociodemographic trends, environmental factors, and cultural patterns influence health status and help-seeking behaviors among African American elderly. Health care services that are more understanding of and responsive to the cultural needs of patients are garnering attention and support as a means of reducing racial and ethnic health care disparities and enhancing the quality of service delivery (Betancourt, Green, Carrillo, & Park, 2005).

Specialized training in cultural competence and an understanding of the unique experience of African American elderly are essential for professional service providers seeking to work effectively in a service delivery capacity with African American elders. Suggestions for combating confirmed disparities in the quality of health care delivered to African American elders are as follows:

Proactive health promotion and outreach programs: Needed programs should be integrated and linked with other community resources frequented by African American elderly (e.g., senior citizen centers, community health centers, and churches where elderly people reside). Given the historic ability of Black churches to mobilize, organize, and influence African Americans in the community, this would be an excellent resource for providing a liaison role to bridge the gap between African American elderly and formal systems of care.

Culturally sensitive communication and advertising strategies: Minority-targeted advertisements on television and radio stations must be utilized to promote health care opportunities. Both written and visual communication should be compatible with cultural beliefs. Information should not be written in highly technical language for an African American elderly readership. Visual images should utilize respected role models from the minority community to disseminate health care and social service information.

Cultural Competence Enhancement Suggestions

Heighten self-awareness: Acknowledge and eliminate any biases and stereotypical thinking patterns.

Individualize: Eliminate stereotypical generalizations. For example, even though educational opportunities were limited (particularly for those who are currently 75 years old and older), do not automatically assume that elderly African Americans are illiterate. Many who had very little formal education can read, write, and count well but some cannot. Recognizing individuality is important because African American elderly are not a monolithic group.

Be genuine, respectful, and courteous: Address African American elderly properly as Mr., Mrs., or Ms. (as a means of showing respect and appropriate regard). Demonstrate a sense of caring and concern. These qualities can be perceived and accurately interpreted even by poorly educated recipients of health and mental health services and can influence their willingness to return for subsequent care.

Actively listen: Be sensitive to possible language barriers. Seek cultural and linguistic interpretations where uncertainty exists in understanding and relating to the language or dialect. Obtain an understanding of certain pronunciations and meanings of various concepts (e.g., diabetes mellitus may be understood and referred to as "sugar"; losing weight may be termed "falling off"). Seek accurate interpretations as needed from relatives and family friends. Withhold diagnostic assessment until a clear understanding of the articulated problem is certain.

MARJORIE E. BAKER
GARY L. LEROY

See also

Cultural Assessment
Cultural Competence and Aging

Internet Resources

Health Disparities Conference Report Web Site
http://www.kaisernetwork.org/healthcast/sophe/08aug05

Healthy People 2010
http://www.HP2010@osophs.dhhs.gov

Institute for Social Research, Research Center for Group Dynamics

Program for Research on Black Americans at the University of Michigan
http://www.irs.umich.edu/rcgd/prba

REFERENCES

Baker, M. E. (2002). Economic, political and ethnic influences on end-of-life decision-making: A decade in review. *Journal of Health and Social Policy*, *14*(3), 27–39.

Betancourt, J. R., Green, A. R., Carrillo, J. E., & Park, E. R. (2005). Cultural competence and health care disparities: Key perspectives and trends. *Health Affairs*, *24*(2), 499–505.

Bonner, G. J., Ferrans, C. E., Moore-Burke, E. F., & Gorelick, P. (2005). Determinants of trust and mistrust in physicians identified by African American family caregivers. *African American Research Perspectives*, *11*(1), 89–102.

Gamble, V. (2002). Under the shadow of Tuskegee: African Americans and health care. In T. La Veist (Ed.), *Race, Ethnicity and Health* (pp. 34–46). San Francisco, CA: Jossey-Bass.

Institute of Medicine of the National Academies (IOM). (2005). Confronting the nation's health disparities. *Institute of Medicine Newsletter* (pp. 1–3).

LeRoy, G. L. (1997). Minority health. *The Ohio Family Physician*, *49*(3), 3–9.

U.S. Department of Health and Human Services (DHHS) (2003). Annual Report on the Health Status of the Nation. Available at http://www.healthypeople.gov/Data/

AGEISM

Ageism is defined as a process of systematic stereotyping and discrimination against people because they are old, just as racism and sexism accomplish this for skin color and gender. Older people are categorized as senile, rigid in thought and manner, and old-fashioned in morality and skills. They may be seen as boring, stingy, cranky, demanding, and useless. Old men are "geezers," "old goats," "gaffers," "coots," "fogies," "gerries," "fossils," and "codgers," and old women are "gophers" and "geese." A "crone," "hag," or "witch" is a withered old woman. In medicine, terms like "crock," "gomer" (get out of my emergency room), "Gork" (God only really knows), and "vegetable" have been commonly used. Ageism allows the younger generation to see older people as different from themselves; thus, they suddenly cease to identify with their elders as human beings. This behavior serves to reduce their own sense of fear and dread of aging. Stereotyping and myths surrounding old age are explained in part by a lack of knowledge and insufficient contact with a wide variety of older people. But another factor comes into play—a deep and profound dread of growing old—although, in fact, most people consider living a long life to be an achievement and strive to live as long as they can.

Ageism is a broader concept than gerontophobia, which refers to a less common, "unreasonable fear and/or irrational hatred of older people, whereas ageism is a much more comprehensive and useful concept" (Palmore, 2005). This concept and term were introduced in 1968 (Butler, 1969). The underlying psychological mechanism of ageism makes it possible for individuals to avoid dealing with the reality of aging, at least for a time. It also becomes possible to ignore the social and economic plight of some older persons. Ageism is manifested in a wide range of phenomena (on both individual and institutional levels), stereotypes and myths, outright disdain and dislike, or simply subtle avoidance of contact; discriminatory practices in housing, employment, pension arrangements, health care, and services of all kinds; and epithets, cartoons, and jokes. The cover of *The New Republic* in 1988 pictured a repulsive group of "greedy geezers," and the inside story claimed that the old are taking away from the young. On the same topic, the cover of the December 3, 2005, issue of *The National Journal* featured a cartoon of a grotesquely obese old man being fed shovels of dollar bills. The caption read, "Oh, Baby! Don't look now, but the oldest Baby Boomers are about to turn 60. Is fiscal doom inevitable once they start eating our greens?"

At times, ageism becomes an expedient method by which society promotes viewpoints about the aged in order to relieve itself of responsibility toward them; at other times, ageism serves a highly personal objective: protecting younger (usually middle-aged individuals, often at high emotional cost) from thinking about things they fear (e.g., aging, illness, and death). Older persons are subject to physical, emotional, social, sexual, and financial abuse.

Following are other contemporary examples of ageism:

- Only 5 of 144 medical schools have full-scale departments of geriatrics.
- Although older persons comprise about 12.4% of the population and use 40% of all medications, the U.S. Food and Drug Administration (USFDA) does not require inclusion of older persons in clinical trials.
- Only 1 of 10 nursing homes meets basic federal staffing requirements.
- Older women have fewer biopsies and less curative therapy for breast cancer than younger women, but 50% of all breast cancers occur after age 65.

Ageism, like all prejudices, influences the behavior of its victims. Older persons tend to adopt negative definitions about themselves and to perpetuate the various stereotypes directed against them, thereby reinforcing societal beliefs. In a sense, older people may "collaborate" with the enemy and with stereotypes (Levy, 2001). Margaret Thaler Singer observed similarities between the Rorschach test findings in members of a sample of healthy aged volunteers in the face of aging and of a sample of American prisoners of war who collaborated with their captors in Korea (Butler, 2007). Some older people refuse to identify with old age and may dress and behave inappropriately in frantic attempts to appear young. Others may underestimate or deny their age.

Business Week (June 19, 1995) published a letter to the editor that stated: "I am ashamed to be a senior citizen when the national budget devotes more money to the needs of the older than to those of our children." Simone De Beauvoir, author of *The Coming of Age*, described her disgust with growing old in response to both the stereotypes and restrictions that society forces upon women in the last third of their lives (Rosenthal, 1990).

Denial is a close cousin of ageism; in affect, it eliminates ageism from consciousness. It is striking how people endeavor to avoid aging through the use of surgery and various nostrums, such as alleged anti-aging medicines.

Ageism can apply to stages of life other than old age. Older persons have many prejudices against the young and may envy the attractiveness and vigor of youth. Angry and ambivalent feelings may flow too between the old and the middle-aged. The middle-aged often bear many of the pressures of both young and old, and they experience anger toward both groups. Since the introduction of the concept of ageism, there have been some gains on the part of older people. The Age Discrimination and Employment Act (ADEA) of 1967, amended in 1978, ended mandatory retirement in the federal government and advanced it to age 70 in the private sector; a 1986 amendment virtually ended it altogether. However, the ADEA is not strongly enforced.

Some of the myths of age include a lack of productivity, disengagement, inflexibility, senility, and loss of sexuality (Bytheway, 1995). There have been some advances in and more attention to the productive capabilities of older people and a better understanding that older persons have desires, capabilities, and satisfaction with regard to sexual activities. The "write-off" of older persons as "senile" because of memory problems, for example, is being replaced by an understanding of the profound and most common forms of what is popularly referred to as "senility"–namely, Alzheimer's disease.

Senility is no longer considered inevitable with age but rather a group of diseases. When the means to effectively treat the dementias are available, ageism will also decline. Reminiscence or life review has helped focus attention on what can be learned from listening to the lives of the old. Indeed, the memoir has become, in the minds of some, the signature genre of our age. Today, old age is in the process of being redefined as a more robust and contributory stage of life. Unfortunately, the underlying dread, fear, and distaste for age remain.

ROBERT N. BUTLER

See also

Autonomy

Communication Issues for Practitioners

Internet Resources

American Bar Association (Facts about law and the elderly)
http://www.abanet.org/media/factbooks/elderlaw.pdf

Age discrimination in employment research report (April 2002).
http://www.aarp.org/research/work/agediscrim.

ILC-USA (Ageism in America)
http://www.ilcusa.org/prj/ageism.htm

Nyberg, James. Clinical trials and older persons: The need for greater representation.
http://www.ilcusa.org/_lib/pdf/clinicaltrialsib.pdf

Wait, Suzanne. Promoting age equality in the delivery of health care.
http://www.ilcusa.org/_lib/pdf/promoting.pdf

REFERENCES

Butler, R. N. (1969). Age-ism: Another form of bigotry. *The Gerontologist*, *9*, 243–246.

Butler, RN (2007). Personal communication. National Institute of Mental Health, Human Aging Study, 1955–66.

Bytheway, B. (1995). *Ageism.* Buckingham, England: Open University Press.

Levy, B. R. (2001). Eradication of ageism requires addressing the enemy within. *The Gerontologist*, *41*, 578–579.

Palmore, E. B. (2005). *Encyclopedia of Ageism.* New York: Haworth Press.

Rosenthal, E. (Ed.) (1990). Women and varieties of ageism. *Journal of Women and Aging*, *2*, 1–164.

AGING AFRICAN AMERICANS

See
African Americans and Health Care

AGING AGENCIES: CITY AND COUNTY LEVEL

Most older adults wish to remain living in their own homes, but they may need assistance, particularly from local resources, to do so. There are many options for older adults. A variety of private and governmental services is available to older adults at the city and county level. Because local services vary greatly, however, it is important for providers to contact the local government for details. Five sources of support for older adults are typically available in most areas of the United States: senior centers, area agencies on aging (AAAs), home health agencies (HHAs), hospice care, and the Eldercare Locator. Programs and services specifically designed for older persons who are actual or potential victims of abuse and neglect are provided by adult protective services.

Senior Centers

Senior centers, in some form, are typically available at the local level even in rural areas. According to the National Council on Aging (NCOA) (2005), approximately 15,000 senior centers exist throughout the United States serving close to 10 million older adults annually. Senior centers are an integral part of the aging network, serving community needs, assisting other agencies in serving older adults, and providing opportunities for older adults to develop their potential as individuals (NCOA, 2005). Centers may offer activities and programs for seniors to enjoy recreation and socialize with their peers. Many senior centers are also congregate meal sites. Some centers have day programs and many provide outreach services through on-site visits from various health care providers (e.g., nurses, podiatrists, nutritionists).

Senior centers are based on the belief that aging is a normal developmental process; that peer interaction that provides encouragement and support is important; and that adults have the right to actively participate in determining matters in which they have a vital interest. The centers attempt to provide an environment where older adults can continue to develop and grow while forming relationships with others. A variety of formal and informal classes and clubs are offered at centers. If the senior center does not provide a needed service, the center may be a resource for referrals to other community services. For many older adults and their families, the senior center serves as the “front door” to community-based services for both the well and the functionally impaired elderly. Senior centers may be operated by a local board of directors; they may be part of local, municipal government; or they may be operated as a nonprofit agency. The NCOA provides information on senior centers.

Area Agencies on Aging

AAAs are responsible for planning, coordinating, evaluating, and monitoring home- and community-based care programs for older adults. Approximately 650 AAAs are run by state, county, or city governments or as nonprofit or public agencies designated by the state. Each AAA is responsible for a designated geographical area known as a planning and service area (PSA). Each AAA creates a plan for its PSA to ensure that local needs of older persons are being addressed. AAAs can be an excellent source of information to service providers and health professionals because they are familiar with most if not all programs serving the needs of older persons in the local community.

Many health care professionals, especially physicians, are unfamiliar with AAAs and their importance to the continuum of care. AAA staff can provide elders and their families with information and suggestions for local resources based on their specific needs. Through this service, AAAs can act as advocates for local elders at either the individual or the policy level. AAAs have financial responsibility to administer federal, state, and local funds to support locally specific services in their PSA. These services can vary widely by region but may include case-management services, transportation, counseling, adult day-care programs, health screening and education, nutritional education, meals, legal assistance, residential repair, physical fitness, recreation, home care, respite care, telephone reassurance, and volunteer services, among others. AAAs monitor the programs they support to ensure that high-quality services are being provided effectively and efficiently. The number of AAAs varies greatly from state to state. Rhode Island has only one AAA, whereas New York has approximately 60. The Eldercare Locator, administered by the National Association of Area Agencies, provides the names, telephone numbers, and service information for AAAs throughout the United States.

Home Health Agencies

HHAs have become major providers of care for older adults. More than 2.4 million elderly and disabled people with Medicare receive care from more than 8,100 Medicare-certified HHAs throughout the United States (CMS, 2006). Home health is covered under the Part A Medicare benefit. Medicare-certified HHAs provide intermittent skilled care. This care is typically provided through the order of a physician for a limited time. There are no exact limitations on the duration of care; it is dependent on the need for skilled services. The goal of the HHA is to help clients safely remain in their homes while receiving the assistance they need to do so. HHAs typically provide a multidisciplinary approach to care that can include skilled, intermittent nursing care; occupational, physical, and speech therapy; respiratory therapy; medical social work; and home health aide services. An in-home assessment is the first step in determining the type and level of client need. A care plan is then designed to address those needs. Nursing services can provide wound care, medication management, and status monitoring, as well as training and support for both the patient and the caregiver. Home health care can be provided through either Medicare, which has stringent eligibility and duration limitations, or private providers (i.e., paid for by the client). Some areas may use HHAs to provide Medicaid-funded long-term custodial care in the home through the federal In-Home Supportive Services Program.

Medicare-certified HHAs can provide social work services to assist seniors with long-range planning, advance directives, short-term counseling, and transition counseling to help people deal with new or changing circumstances; they can also advocate for older persons. Home health aides provide assistance with bathing and grooming, transferring, hygiene, toileting, household chores, meal preparation, exercises, and errands. Home-care agencies can be located by contacting the National Association for Home Care & Hospice or through the local Yellow Pages. Approximately 24% of home-care agencies throughout the United States are hospital-based (National Association for Home Care & Hospice, 2004), so contacting the local hospital may be an effective method of locating HHAs.

Hospice Care

Hospice care is an important component of the local care continuum. Hospice services provide palliative rather than curative care to address the social, emotional, and spiritual needs of terminally ill individuals and their families. Often thought of as a program for those with cancer, hospice care can be provided to any terminally ill individual, regardless of diagnosis, including those with end-stage respiratory disease, heart disease, Alzheimer's disease, AIDS, or amyotrophic lateral sclerosis. Like HHAs, hospice care is typically interdisciplinary in nature and may include nurses, social workers, chaplains, home-care aides, and bereavement counselors to help people cope with their illness and end-of-life issues.

The hospice team specializes in symptom management, providing the patient with the highest possible quality of life. Hospice care can take place in many different settings, including the individual's home, a hospital, or a long-term-care facility. There are 2,884 Medicare-identified hospices as of January 2006 and an additional 200 volunteer hospices in the United States (National Association for Home Care & Hospice, 2006). These hospices served 797,117 Medicare patients in 2004 (National Association for Home Care & Hospice, 2006). Information regarding hospice care at the local level can be obtained through the local Yellow Pages, the National Association for Home Care Web site, or the National Hospice Helpline (1-800-658-8898). This toll-free number can provide referrals to national and international hospice organizations (see the Web site for the National Hospice Organization).

Eldercare Locator

The Eldercare Locator provides the names, telephone numbers, and service information for agencies throughout the United States. This service is staffed by trained professionals who provide the information needed to contact a care provider or agency in the designated area. They provide information on services such as meal programs, home care, transportation, housing alternatives, home repair, recreation, and social activities, as well as legal and other community services. The National Association of Area Agencies on Aging administers the Eldercare Locator in partnership with the National Association of State Units on Aging. The toll-free number for the Eldercare Locator is 1-800-677-1116, and it is operational Monday through Friday, 9 a.m. to 8 p.m., Eastern Standard Time. One value of the Eldercare Locator is its ability to research services for family members whose older relatives live far from them.

William T. Lawson

See also

Adult Protective Services
Aging Agencies: Federal Level
Aging Agencies: State Level
Case Management
Home Health Care
Meals on Wheels
Medicare
Older Americans Act
Retirement
Senior Centers
Veterans and Veterans Health

Internet Resources

Eldercare Locator
http://www.n4a.org/locator/

The National Association for Home Care & Hospice
http://www.nahc.org

National Association of Area Agencies on Aging
http://www.n4a.org

National Council on the Aging
http://www.ncoa.org

National Hospice Organization
http://www.nho.org

REFERENCES

CMS (Centers for Medicaid and Medicare Services) (2006). Home health quality initiatives: Overview. Available at http://www.cms.hhs.gov/HomeHealthQualityInits/

National Council on the Aging, Senior Centers (October 2005). Available at http://www.ncoa.org//content.cfm?sectionID=103&detail=1177

National Association for Home Care & Hospice (2004). Basic statistics about home care. Available at http://www.nahc.org/04HC_Stats.pdf

National Association for Home Care & Hospice (2006). Hospice facts and statistics. Available at http://www.nahc.org/hospicefs06.pdf

AGING AGENCIES: FEDERAL LEVEL

The Administration on Aging (AoA), an agency of the U.S. Department of Health and Human Services, functions as the federal focal point and advocacy agency for older persons. The official federal agency dedicated to policy development, planning, and the delivery of supportive home- and community-based services to older persons and their caregivers, the AoA administers federally funded programs established under the Older Americans Act (OAA).

Passed by Congress and signed into law by President Lyndon B. Johnson in 1965, the OAA has been amended several times and was last reauthorized in 2000. Congress intended the act to improve the lives of all older Americans in areas such as income, health, housing, employment, in-home and community services, research, and education. Anyone 60 years of age or older qualifies for programs funded by the act, even though services tend to be targeted to those elders in greatest social and economic need, with particular attention to low-income minority elderly, Native Americans, persons with Alzheimer's disease and related disorders (and their families), and rural elderly. The act's various titles form the foundation for a broad spectrum of services and providers that have become known as the Aging Network. Implementation of the network in the last 40 years has resulted in an impressive system of services on both the national and local levels that strives to promote independent living, create opportunities for active older persons, and meet the needs of older persons at risk of losing their independence.

The AoA has overall responsibility for administering the OAA and distributing federal funds in accordance with the act's requirements. In addition, it sets policy for the Aging Network at the state and local levels and funds national grantees that provide research, training, support, and demonstration programs for the Aging Network. The AoA is responsible for numerous functions specified in the act, including effective and visible advocacy for the elderly within the federal government, coordination of research and implementation of programs, provision of technical assistance to states and communities, collection and dissemination of information, and monitoring and evaluation of programs developed pursuant to the act.

The AoA is headed by the assistant secretary for aging (ASA), who is appointed by the president. The ASA has the authority to issue regulations and policies that interpret and implement the OAA and oversees the agency that works in partnership with a network of some 56 State Units on Aging (SUAs); 655 Area Agencies on Aging (AAAs); 236 Native American, Alaskan, and Hawaiian tribal organizations representing 300 tribes; 5,000 senior centers; and more than 27,000 local service providers. The AoA has 10 regional offices throughout the country that provide technical assistance to the states, communicate AoA national policies, and review and monitor the SUA plans. The AoA distributes funds authorized by the act to the SUAs on the basis of state plans and according to a formula that considers the number and percentage of older persons in each state. The SUAs then distribute the funds to AAAs, which contract with local service providers.

The majority of services provided throughout the Aging Network are supported by funds authorized under Title III of the act. Each community offers different services, depending on available resources. Title III funds can be used for information and referral services; supportive services and centers; disease prevention and health promotion; nutrition services, including food distribution and both congregate and home-delivered meals; homemaker, home health aide, and other in-home services for the frail elderly; senior centers and daycare programs; caregiver support programs; transportation; ombudsman programs for residents of long-term-care facilities; crime prevention and victim assistance programs; translation services for non-English-speaking elders; protective services for abused, neglected, and exploited elders; and legal services.

In addition to services and programs funded under Title III, the AoA administers funds under Title IV of the act, earmarked for its own operations and for providing direct grants and contracts for research, training, and demonstration programs on a national level through the Discretionary Funds Program. The Title IV mandate is aimed, generally, at building knowledge, developing innovative model programs, and training personnel for service in the field of aging.

Title V of the act authorizes funds to subsidize part-time community-service jobs and training opportunities for unemployed, low-income persons age 55 and older. Established under Title V, the Senior Community Services Employment Program is actually administered by the U.S. Department of Labor.

Title VI awards annual grants directly to Tribes and Tribal Organizations and Native Organizations for nutrition services (including congregate and home-delivered meals), information, and access; transportation; and in-home supportive services. Training and technical assistance are provided to Title VI grantees both electronically and through onsite, telephone, and written consultation; national meetings; and newsletters. The AoA funds two Resource Centers for Older Indians, Alaska Natives, and Native Hawaiians to serve as focal points for the development and sharing of technical information and expertise to Indian organizations, Title VI grantees, Native American communities, educational institutions, and professionals and paraprofessionals in the field. Since 2000, Title VI grants support programs for caregivers of Native Americans.

Title VII oversees the protection of vulnerable elder rights. These activities include state long-term-care ombudsman programs; programs for the prevention of elder abuse, neglect, and exploitation; and state elder rights and legal assistance development.

Long-term-care ombudsmen advocate on behalf of individuals and groups of residents in nursing homes, board and care homes, assisted-living facilities, and other adult care facilities. They also work to effect system changes on local, state, and national levels. The AoA provides funds for national support groups, including the National Long-Term Care Ombudsman Resource Center, operated by the National Citizens' Coalition for Nursing Home Reform in conjunction with the National Association of State Units on Aging. The center provides on-call technical assistance and intensive annual training to assist ombudsmen.

The AoA supports a national legal assistance system, primarily through state legal services developers. In addition, AoA's Discretionary Funds Program helps support national legal support projects, as well as centers that provide training and technical assistance to advocates in the field. The support centers collaborate in their efforts through information exchange, training, and liaison with field advocates. Support centers currently funded by the AoA are the National Consumer Law Center, the nation's consumer law expert; the National Senior Citizens Law Center, which provides consultation to senior legal services providers and substantive training sessions; the Center for Social Gerontology, a nonprofit research, training, and social policy organization dedicated to promoting the autonomy of older persons and advancing their well-being in society; the American Bar Association Commission on Law and Aging, which examines law-related concerns of older persons; and the AARP Foundation's National Training Project, which provides training to lawyers and other professionals who advocate for the rights of older persons.

Other public services supported by AoA funds include the Eldercare Locator, the National Aging Information Center, the National Center on Elder Abuse, and the Pension Rights Center. The Eldercare Locator is administered by the AoA, together with the National Association of Area Agencies on Aging and the National Association of State Units on Aging. It is a nationwide directory-assistance service designed to help older persons and caregivers locate local support resources. The National Aging Information Center serves as a central source for a wide variety of programs and policies, related materials, and demographic and other statistical data on the health, economic, and social status of older Americans. Its services are free of charge and include access to information, databases, printed materials, statistical information, and a reading room and reference collection. The National Center on Elder Abuse provides information to professionals and the public, offers technical assistance and training to elder-abuse agencies and related professionals, conducts short-term research, and assists with elder-abuse program and policy development. The Pension Rights Center serves as the AoA's National Pension Assistance Resource Center, providing legal consultation and training to pension counseling projects, SUAs, and legal services for the elderly providers.

Several other federal agencies have programs that provide services to older persons, even though the agencies do not exclusively serve older persons. The Centers for Medicare and Medicaid Services (CMS) administer Medicare, Medicaid, and child health insurance programs. Many older Americans receive health care assistance through Medicare and Medicaid. In 2003, the AoA and CMS started the Aging and Disability Resource Center Program to provide financial support for state efforts to streamline access to long-term care. The National Institute on Aging, one of the National Institutes of Health, promotes healthy aging by conducting and supporting biomedical, social, and behavioral research and public education. The Social Security Administration is responsible for several programs that directly affect seniors, including the retirement, survivors, and disability insurance program and the supplemental security income program.

Information on all the agencies mentioned is available on the main Web site of the Administration on Aging. Caregivers, service providers, and others involved with the needs, protection, and advocacy of older persons should be familiar with the vast array of services and programs supported or administered by the AoA and the agencies and organizations with which it collaborates.

MARY JANE CICCARELLO

See also

Aging Agencies: City and County Level
Aging Agencies: State Level
Older Americans Act
Social Security

Internet Resources

Administration on Aging
http://www.aoa.gov/

Centers for Medicare and Medicaid Services
http://www.cms.hhs.gov

Eldercare Locator
http://www.eldercare.gov

National Aging Information Center
http://www.aoa.gov/NAIC/

National Institute on Aging
http://www.nia.nih.gov

National Senior Citizens Law Center
http://www.nsclc.org

Social Security Administration
http://www.ssa.gov/

AGING AGENCIES: STATE LEVEL

State services are designed to assist the elderly and their caregivers in maintaining health and adequate finances and remaining safely in the community for as long as possible. Many state services developed pursuant to passage of the federal Older Americans Act (OAA). The act charges states to provide services for those who are 60 and older and to remove economic, physical, and social barriers to their remaining in the community and out of institutions. Many federally funded services administered by the states have federal guidelines to ensure uniform eligibility nationwide. However, with trends for increased local and state control over the allocation of funds and creation of alternate delivery systems, the same service can vary among states.

The state's role in care for the elderly falls into four categories: research, information dissemination, investigation and licensing, and services. How these functions are provided varies within and among states and state agencies.

Research

States conduct research on topics that affect quality of life and services for their citizens, such as quality of care in nursing homes; cost-effectiveness of managed long-term care and the effect of taxes; and on new services, such as assisted living. Several states are planning services for the projected increase in the number of elderly in the 21st century.

Dissemination of Information

Many state agencies have toll-free telephone services and Web sites to provide information for the elderly and their caregivers on topics such as finding state services, obtaining preventive services, and contacting investigatory agencies to report fraud and abuse. Almost all states offer a federally funded state health insurance program that provides information and counseling on health insurance, including Medicare and Medicaid, long-term-care insurance, and Medigap insurance policies. State veterans' agencies provide information regarding veterans' benefits (state and federal) such as tax reductions, home-care services, and health care.

Investigation and Licensing

State governments investigate fraud and abuse and control the licensing and certification of individuals (i.e., physicians, nurses, social workers, and dentists) and organizations that provide care to elderly residents of the state. Nursing homes and adult homes are licensed, certified, regulated, and surveyed by state agencies. In many states, the office of the long-term-care ombudsman investigates charges of institutional abuse, mistreatment, and neglect.

Services

All states provide adult protective services that investigate reports of and protect the elderly from financial, sexual, physical, and mental abuse. Some states have programs and services for elderly residents that may not be replicated in other states, such as prescription drug programs that subsidize pharmaceuticals, special school and property tax breaks, and recreational benefits. The services may have eligibility criteria based on medical need, age, and income.

Generally, services for the elderly are administered and monitored by state agencies that receive and pass federal and state funds to localities. The agencies that administer these federal funds may differ in different states; programs and jurisdictions vary. Some states provide direct services to senior citizens, others monitor locally delivered services. A local Area Agency on Aging or the State Unit on Aging can provide information on which services are available in communities and how they can be accessed by clinicians, older adults, and family members.

Several state-operated services support health care needs or provide preventive health programs such as health screening and well-patient clinics. Preventive and rehabilitative mental health services offered at the community level may be state funded and operated.

Many states offer property, sales, and school tax breaks for senior citizens or low-income older adults. Senior citizens may pay reduced admission fees at state parks and recreational sites. Some states also provide recreational or sport events—"senior games" or "Senior Olympics"—designed to help older adults remain healthy and competitive.

Many support services provided locally, such as home care to assist older adults with personal hygiene, light housekeeping, meals, and chores, are monitored by the state. A case-management or care-management professional assigned by the state or local agency assesses the needs of the older person and establishes a plan of care.

Services that may be available outside the home (i.e., community-based services) include nutrition education and counseling; transportation for medical appointments, shopping, and visiting; and other activities. Lunchtime or evening meals can be provided in group (congregate) settings at community sites. Senior centers in urban and rural areas offer support services such as meals, counseling, recreation, and visiting. Social-model adult day centers offer support, management, and nutrition services. Medical-model centers provide rehabilitation and therapy as well as support and nutrition services.

Financial assistance is available through state-monitored programs that help with the costs of housing or home renovation, health care (i.e., Medicaid), and prescription drugs and provide state-funded employment opportunities for low-income older adults. The maze of services can be overwhelming to older adults, particularly those for whom English is a second language, and their families. Thus, it is critical that health care professionals be aware of the services and benefits elders need to maintain a quality life. The National Association of State Units on Aging, a nonprofit association representing the nation's 56 officially designated state and territorial agencies on aging, provides general and specialized information, consultation, training, technical assistance, and professional-development support on the full range of policy, program, and management issues of concern to the states.

William T. Lawson

See also

Adult Day Services
Aging Agencies: City and County Level
Aging Agencies: Federal Level
Case Management
Meals on Wheels
Veterans and Veteran Health

Internet Resources

Family caregiver support: State facts at a glance
http://www.nasua.org/familycaregiver/statefacts.htm

National Aging Information and Referral Support Center
http://www.nasua.org/informationandreferral/

The National Association of State Units on Aging
http://www.nasua.org/index.cfm

U.S. Administration on Aging
http://www.aoa.dhhs.gov/aoa/pages/state.html

AIDS

See
Human Immunodeficiency Virus (HIV) and AIDS

ALLERGIC RHINITIS

Atopic diseases are often overlooked or ignored in the elderly because allergies more commonly present before age 30. Allergies can occur at any age and can persist into old age. Allergic conditions such as allergic rhinitis, allergic conjunctivitis, pruritus, chronic urticaria, contact dermatitis, food allergies, drug hypersensitivity, and asthma can present for the first time late in life (Georgitis, 2001).

Rhinitis

Rhinitis is prevalent among the elderly and can be caused by allergic rhinitis, polyps, atrophic rhinitis, vasomotor rhinitis, sinusitis, infectious rhinitis, drug-induced rhinitis, idiopathic rhinitis, and sometimes neoplasm (Lucente & Har-El, 2004). The aging process includes normal physiological changes that can aggravate underlying nasal symptoms.

With aging, the total body water content decreases, mucus-secreting glands deteriorate, and nasal blood flow lessens, all of which contribute to atrophy and drying of the nasal mucosa. Age-related changes include degeneration of collagen and elastic fibers in the dermis, resulting in weakening of upper and lower lateral nasal cartilages, retraction of nasal columella, and downward rotation of the nasal tip, all of which increase nasal airflow resistance (Sahin-Yilmaz & Corey, 2007). The mucociliary system is also less effective, and mucus viscosity increases.

Allergic Rhinitis

Allergic rhinitis affects more than 20 million people and is more common in younger than elderly patients. Complaints range from minor to severe.

Pathophysiology

The immune system protects the body from dangerous bacteria and viruses while ignoring harmless substances. Allergies occur when the immune system reacts inappropriately to harmless substances such as pollen, animal dander, mold spores, or dust mites. In nonallergic individuals, nothing happens when pollen or cat dander enters the body. These same substances activate the immune system when they enter the body of an allergic rhinitis sufferer, causing type-I hypersensitivity reaction. IgE antibody binds to mast cell receptors, releasing mediators such as histamine, leukotrienes, prostaglandin, and platelet-activating factor. Chemotactic factors are also released and recruit neutrophils, eosinophils, and basophils to produce inflammation and make the eyes and inside of the nose itch, swell, and produce watery mucus (Bellanti & Wallerstedt, 2000).

Diagnosis

Patients are diagnosed clinically with a thorough history and physical examination. Symptoms of allergic rhinitis include clear, thin rhinorrhea, nasal congestion, sneezing, pruritis, postnasal drip, and various ocular complaints. Physical examination usually reveals enlarged, pale, blue, edematous turbinates and a thin watery discharge (Lucente & Har-El, 2004). They may also exhibit "allergic shiners" secondary to venous stasis of the eyelids. Frequently, pharyngeal inflammation and postnasal drip may be seen in the oropharynx.

Treatment may be started empirically. An allergist can perform in vivo skin tests or in vitro radioallergosorbent tests (RAST) to confirm the diagnosis and identify specific allergen triggers that lead to improved environmental management and/or directed immunotherapy.

Complications

Allergic rhinitis may lead to chronic symptoms including eustacian tube dysfunction, serous otitis media, chronic sinusitis, and pharyngitis secondary to postnasal drip (Kaliner, 2000).

Management and Treatment

Environmental Control. The first line of defense against allergies is to avoid or minimize exposure to offending allergens. Allergy testing may identify the culprit allergens. If the patient is allergic to pollen, windows should be kept closed and air-conditioning used to filter incoming air. The air-conditioner filter needs frequent changing but preferably not by the patient. Avoiding unnecessary travel during peak pollination times (i.e., late spring to early autumn) may help. Weather reports frequently include local pollen counts, which vary geographically.

Allergies to indoor allergens are more challenging to treat in the elderly. Mold, roach, and dust-mite avoidance is difficult. Vigorous cleaning is extremely helpful but not always possible. Mold and dust mites proliferate in warm, humid environments; although keeping the home dry with a humidity of less than 60% helps, humidity less than 30% can irritate the nose, especially because older patients often have dryer and more atrophic mucosa. The elderly may need assistance to fix water leaks, clean house, and eradicate pests such as roaches and mice. If the patient has a dust-mite allergy, removing carpeting and replacing upholstery with wipeable furniture is helpful. Acaricides is recommended if carpeting cannot be removed. Benzyl benzoate kills dust mites but does not denature the dust-mite allergen; tannic acid is a protein-denaturing agent that does not kill dust mites but denatures the allergen. These products require frequent application and can become expensive and time-consuming. All bedding should be washed weekly in hot water above 135° F (57° C), and mattresses and pillows should be encased in plastic, impermeable, allergy-proof dust-mite covers.

Patients who are allergic to their pet's dander can try to limit exposure by keeping the pet outdoors or at least off the bed. Cat allergen particles, which are produced by the cat's sebaceous glands, are small and become airborne when skin scales are shed. The particles remain airborne for long periods and can be found in upholstery, carpeting, and bedding. Relocating an animal is rarely desirable or feasible, and even then it takes several months of good cleaning to reduce cat-allergen levels. Bathing the cat weekly, not allowing the animal into the patient's bedroom, and frequent, thorough vacuuming all help. Installing high-efficiency particulate arresting (HEPA) filters on the vacuum cleaner, air ducts, and in heating systems also reduces airborne allergens.

Unfortunately, avoiding allergens such as trees and grass is sometimes impossible. Mold is ubiquitous both indoors and outdoors; it is almost impossible to avoid completely. It can also be very costly and laborious to dispose of all of the patient's rugs and upholstered furniture.

Medication. Three classes of medications are used: antihistamines, decongestants, and anti-inflammatory medications. Antihistamines block the effect of histamine at the H1 receptor and prevent itchy and runny nose, sneezing, and postnasal drip. Decongestants act by shrinking the dilated blood vessels by constricting the engorged venous vessels, thereby decreasing nasal swelling and congestion. Anti-inflammatory medications, such as corticosteroids and mast cell stabilizers, act directly on immune cells to prevent release of chemical mediators.

Although numerous pills, nasal sprays, and eyedrops are available over the counter (OTC), these must be used with caution, and providers should always ask about OTC use when reviewing medication with patients.

OTCs generally contain older, first-generation antihistamines that effectively relieve allergy symptoms but often cause sedation and impaired judgment. Studies show that sedative antihistamines impair driving ability as much as alcohol (Weiler et al., 2000). Elderly patients who need to drive should avoid taking such sedative antihistamines. Such medications also contain anticholinergic properties, producing dryness of mouth and eyes, blurred vision, constipation, and urinary retention (Kaliner, 2002). First-generation antihistamines should be avoided by patients with a history of symptomatic prostatic hyperplasia, bladder neck obstruction, recurrent urinary tract infections, arrhythmias, or narrow-angle glaucoma.

Many newer prescription antihistamines offer much-needed relief with significantly less sedation (Hansen, Klimeck, & Hormann, 2005). Nonsedating prescription antihistamines include fexofenadine and loratadine. Cetirizine is also available but is mildly sedative. Terfenadine and astemizole were removed from the U.S. market in the 1990s because serious cardiac arrythmias; deaths were reported when they were used together with quinine, certain antibiotics, antifungal medications, and grapefruit juice. Patients may still have them in their medicine cabinets and need to discard them for newer, safer antihistamines. Cetirizine, loratadine, and fexofenadine are available in liquid suspension and can be used by patients who have difficulty swallowing pills or have swallowing disorders. Azelastine is the first and only antihistamine available as a nasal spray. Topical antihistamines are now available and offer an effective alternative with fewer systemic side effects.

Because antihistamines have little effect on nasal congestion, OTC pills and nasal sprays often contain decongestants. Decongestant pills do not cause sedation; rather, they can cause jitteriness, irritability, anxiety, insomnia, palpitations, elevated blood pressure, and urinary problems. Rarely, cerebrovascular events and cardiovascular problems, including myocardial infarction and arrhythmia, have been reported. Thus, elderly patients with poorly controlled hypertension may need to avoid decongestants. Decongestant nasal sprays such as oxymetazoline and phenylephrine are extremely effective for short-term use but, if used chronically, can cause *rhinitis medicamentosa* (i.e., medication-induced congestion and rhinitis). Topical decongestant nasal sprays should not be used for more than 3 or 4 days; prolonged use can result in increased rebound nasal swelling and congestion.

Anti-inflammatory medications effectively relieve nasal symptoms of itching, congestion, sneezing, and watery discharge. Active ingredients are corticosteroids and mast cell stabilizers. These medications are available as nasal sprays and are often used in conjunction with antihistamine pills. The steroid nasal sprays include fluticasone propionate, triamcinolone acetonide, flunisolide, beclomethasone dipropionate, budesonide, and mometasone furoate monohydrate. The mast cell stabilizer cromolyn is now available OTC as a nasal spray. Side effects of topical nasal steroids include severe dryness of the nasal mucosa, thus increasing the risk for epistaxis. This risk may be compounded by concomitant use of aspirin or other blood thinners. Many practitioners encourage concurrent use of nasal saline spray with nasal steroids to prevent this complication.

The time needed for medications to become effective varies. Antihistamines, because they directly block the chemical mediator histamine, work rapidly and are generally effective within hours. Anti-inflammatory medications take longer to work because they target and prevent immune cells from releasing chemical mediators For example, corticosteroids can take hours to days to become effective, and cromolyn can take 2 weeks to reach effective levels.

Immunotherapy. If the combination of avoidance techniques and medication fails to control symptoms, "allergy shots" or immunotherapy may build tolerance to allergens. Increasingly larger doses of allergens are injected over time. Immunotherapy is the only available treatment that has the potential to cure an allergy, and it has been used to treat seasonal and perennial allergic rhinitis caused by pollens, pet allergens, dust mites, and some molds. Because each patient is allergic to different allergens, immunotherapy must be individualized.

Immunotherapy carries a small risk of systemic reactions that range from acute rhinoconjunctivitis or urticaria to severe bronchospasm or anaphylaxis. Elderly patients with comorbid heart disease, poorly controlled asthma, or severe chronic obstructive pulmonary disease are at increased risk for severe anaphylactic reactions. The risk–benefit ratio must be carefully weighed for elderly patients.

Medicare, Medicaid, and private insurance generally cover immunotherapy, but coverage may vary from state to state. Precertification or preapproval may be required.

RAMEZ HABIB

See also

Immunization
Over-the-Counter Drugs and Self-Medication
Polypharmacy: Drug-Drug Interactions
Pruritus (Itching)

Internet Resources

American Academy of Otolaryngologic Allergy
http://www.aaoa.org

American Academy of Otolaryngology and Head and Neck Surgery.
http://www.entnet.org/healthinfo/sinus/allergic_rhinitis.cfm

Geriatric Times
http://www.geriatrictimes.com/g020435.html

WebMD: Medscape
http://www.medscape.com/viewarticle/505773_3

WebMD: emedicine
http://www.emedicine.com/med/topic104.htm

REFERENCES

Bellanti, J. A., & Wallerstedt, D. B. (2000). Allergic rhinitis update: Epidemiology and natural history. *Allergy and Asthma Proceedings*, *21*(6), 367–370.

Georgitis, J. W. (2001). Prevalence and differential diagnosis of chronic rhinitis. *Current Allergy and Asthma Reports*, *1*(3), 202–206.

Hansen, J., Klimek, L., & Hormann, K. (2005). Pharmacological management of allergic rhinitis in the elderly: Safety issues with oral antihistamines. *Drugs & Aging*, *22*(4), 289–296.

Kaliner, M. (2000). *Current review of allergic diseases.* Philadelphia: Current Medicine, Inc.

Kaliner, M. A. (2002). H1-antihistamines in the elderly. *Clinical Allergy & Immunology*, *17*, 465–481.

Lucente, F., & Har-El, G. (2004). *Essentials of Otolaryngology* (5th ed.). New York: Lippincott Williams & Wilkins.

Sahin-Yilmaz, A. A., & Corey, J. P. (2007). Rhinitis in the elderly. *Clinical Allergy & Immunology*, *19*, 209–219.

Weiler J.M., Bloomfield J.R., Woodworth G.G., Grant A.R., Layton T.A., Brown T.L., McKenzie D.R., Baker T.W., Watson G.S. (2000). Effects of fexofenadine, diphenhydramine, and alcohol on driving performance. *Ann Intern Med.* 132, 354–63.

ALTERNATIVE AND COMPLEMENTARY MEDICINE

Alternative and Complementary Medicine (CAM) is a broad term generally used to define those interventions utilized outside the conventional medical model taught in modern medical schools and/or practiced in hospitals throughout the world (Flaherty & Takahashi, 2004).

Many elderly persons turn to CAM modalities and practitioners to increase their quality of life. Often, help is sought for those conditions for which conventional medicine has no clearly efficacious treatment. CAM use may be most common among persons with arthritis, although the use of CAM modalities may not be for arthritis conditions alone (Ahmed, Anuntiyo, Malemud, & Haqqi, 2005; Quandt et al., 2005). It is true that for many CAM modalities there is a paucity of scientific literature examining the efficacy and safety. The body of literature is maturing, however, and many randomized controlled trials have either been published or are in progress. CAM modalities are as broad as the variety of conditions they may successfully aid; only some areas of interest are discussed herein.

Prevention of falls is of great concern. Several studies have now documented efficacy with tai chi and more recently with yoga-based programs. Other movement-based therapies such as the Feldenkrais method and Alexander technique have received scant but promising study.

Pain associated with arthritis is common. Supplements such as s-adenosylmethionine (SAM-e) have some demonstrated efficacy and safety for arthritis pain, although little research has occurred in the elderly population. SAM-e may also be useful in the treatment of depression and liver disease with minimal side effects and medication interaction.

Other interventions for pain include physical modalities, exercise, and botanicals. Acupuncture has received increasing documentation for its effect on the alleviation of pain, particularly headaches, back pain, and arthritic pain of the knee (Berman et al., 2004). There are currently approximately 6,000 medical doctors in the United States trained to use acupuncture.

Other modalities, such as Iyengar yoga and static magnets, may be helpful for chronic knee pain and/or osteoarthritis. Common herbs such as ginger and turmeric as well as less common herbals such as *Commiphora mukul* (i.e., a species of myrhh) show promise in preliminary research in the treatment of arthritis.

Some CAM modalities are simple and can be provided by willing caregivers without highly sophisticated training. Massage has been studied for its role in decreasing blood pressure, elevating mood, and decreasing pain in stroke patients. Music has been shown to increase sleep quality and decrease chronic arthritis pain in older persons, and music-based exercise may increase cognition in demented persons.

Insomnia is a problem in the aging population and may cause increased morbidity in the elderly. The risk of an ischemic stroke is increased in men whose sleep is frequently disturbed, and daytime sleepiness is associated with a significant increase in ischemic heart disease events.

While many herbs have historical precedent for the treatment of insomnia, very little study has been conducted with the elderly population. Herbs such as valerian, skullcap, hops, passionflower, and lavender have traditional use and are probably harmless when taken as a mild tea on an occasional basis (Duke, 2002). The use of essential oils such as lavender, chamomile, and Ylang-Ylang as aromatherapy is intriguing. Melatonin may be useful in improving subjective reports of sleep quality and age-related cognitive decline and increasing daytime activity.

Digestive disturbances such as constipation, gastroesophageal reflux, and loss of appetite may be addressed with nutritional supplements and herbal teas. Many household herbs and spices can be used in moderation and therefore are considered safe. For example, nutmeg is useful in diarrhea, sage for indigestion and diarrhea, and fennel for indigestion. A simple salad of dandelion greens may be of aid for gas, indigestion, and diminished appetite. In some cases, taking digestive enzymes and powdered calcium after meals may alleviate gastroesophageal reflux.

Of the nutritional supplements on the market, the one with the greatest range of applications and safety profile is omega-3 fatty acids in the form of fish oil. Omega-3 fatty acids are useful in the treatment of cardiovascular disease and stroke (Studer, Briel, Leimenstoll, Glass, & Bucher, 2005). Recent clinical trial data examining fish-oil supplementation have demonstrated a significant reduction of total mortality, coronary heart disease death, and sudden death. Results of trials of fish oil and depression have been mixed, and fish-oil supplementation may be most efficacious in depressed persons with low omega-3 levels. Other conditions in which omega-3 supplementation may play a role include inflammatory bowel disease, rheumatoid arthritis, autoimmune kidney disease, and dementia.

Patients should be counseled to obtain a high quality omega-3 product that is free of heavy metals, pesticide residues, and vitamin A. Reputable brands now supply third-party assays of their products. Whereas fish consumption itself appears to decrease the risk of stroke and Alzheimer's disease, mercury (as a pollutant in the fish) may attenuate the value of the fish oil, one reason why using the supplement may be more advantageous than eating more servings of fish.

Treatment of dementia with herbs has received some study in the peer-reviewed literature. Simple herbs such as rosemary, sage, mint, thyme, turmeric, garlic, and tea (Duke, 2002) may be useful in the prevention and treatment of memory and cognition problems. Although conclusive evidence may await future research, frequent use of such herbs and spices in daily cooking has historical precedent. Medicinal herbs such as ginko and Huperazine A may have application when used under the guidance of a trained professional.

Several herbs have received significant study for use in the treatment of benign prostate hypertrophy. Long-term safety data are lacking; however, it appears that herbs such as saw palmetto (*Serenoa repens*), African prune tree (*Pygeum africanum*), and rye pollen extract (*Cernilton*) may provide significant relief of symptoms. Self-treatment is discouraged; it may prevent consultation with physicians and delay diagnosis of potentially treatable prostate cancer.

Drug–herb interactions present one of the greatest barriers to use of herbs in elderly populations. Of significant concern is the metabolism of herbs utilizing the cytochrome P-450 (CYP 3A4) pathway and interference with drug metabolism. Perhaps the most famous of these is simple grapefruit, well documented to increase the bioavailability of drugs by inhibition of the cytochrome pathway. Some authors have suggested that controlled use of grapefruit juice be used to diminish the dose of expensive medications. Persons taking coumadin need to be particularly vigilant when using any herbs or supplements because the metabolic pathways of these substances are often unknown, and the consequences of affecting the International Normalized Ratio (INR) could be grave. However, with careful monitoring, it ought to be possible to judiciously use herbs in this setting on a case-by-case basis.

ROBERT A. SCHULMAN

See also

Dementia: Nonpharmacological Therapy

Internet Resources

American Academy of Medical Acupuncture
http://www.medicalacupuncture.org/

The American Botanical Council
http://www.herbalgram.org/

Association of Accredited Naturopathic Medical Colleges
http://www.aanmc.org/index.php

Cochrane Library
http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/HOME

International Feldenkrais Federation
http://www.feldenkrais-method.org/

Southwest School of Botanical Medicine
http://www.swsbm.com/HOMEPAGE/HomePage.html

REFERENCES

Ahmed, S., Anuntiyo, J., Malemud, C. J., & Haqqi, T. M. (2005). Biological basis for the use of botanicals in osteoarthritis and rheumatoid arthritis: A review. *Evidence-Based Complementary and Alternative Medicine*, *2*(3), 301–308.

Berman, B. M., Lao, L., Langengerg, P., Lee, W. L., Gilpin, A. M. K., & Hochberg, M. C. (2004). Effectiveness of acupuncture as adjunctive therapy in osteoarthritis of the knee: A randomized, controlled trial. *Annals of Internal Medicine*, *141*(12), 901–910.

Flaherty, J. H., & Takahashi, R. (2004). The use of complementary and alternative medical therapies among older persons around the world. *Clinics in Geriatric Medicine*, *(May) 20*(2), 179–200.

Quandt, S. A., Chen, H., Grzywacz, J. G., Bell, R. A., Lang, W., & Arcury, T. A. (2005). Use of complementary and alternative medicine by persons with arthritis: Results of the National Health Interview Survey. *Arthritis Care & Research*, *53*(5),748–755.

Studer, M., Briel, M., Leimenstoll, B., Glass, T. R., & Bucher, H. C. (2005). Effect of different antilipidemic agents and diets on mortality: A systematic review. *Archives of Internal Medicine*, *165*, 725–730.

ALZHEIMER'S ASSOCIATION

Alzheimer's disease, the most common form of dementia, is a progressive degenerative disease of the brain. An estimated 4.5 million Americans have Alzheimer's disease and an estimated 19 million family members consider themselves "caregivers" for persons with Alzheimer's disease. Alzheimer's care takes a unique physical, emotional, and financial toll on families (Ory, Hoffman, Yee, Tennstedt, & Schulz, 1999), and recent research links increased risk of mortality to spousal Alzheimer's care strain (Schulz & Beach, 1999).

Alzheimer's disease is a major cause of death (National Center for Health Statistics, 1998). One in 10 persons older than age 65 and 30% to 40% of persons older than 85 have Alzheimer's disease. Alzheimer's disease progresses over an average of 8 years—for some, as many as 20 years—from the onset of symptoms. At later stages, persons with Alzheimer's disease are vulnerable to developing other medical conditions and dying before they would if they did not have Alzheimer's disease. The disease knows no social or economic boundaries and affects men and women almost equally, although more women live to the age of greatest risk. Risk factors include advancing age and a strong family history, although rare familial Alzheimer's disease can begin in the 30s or 40s or 50s.

More than 70% of persons with Alzheimer's disease live at home, where family and friends provide almost 75% of their care. Most persons with Alzheimer's disease are cared for at home, although more than 60% of persons in nursing homes and up to 40% of persons living in assisted-living and non–nursing-home residential care have Alzheimer's disease. Alzheimer's disease is devastating to patients and to families, with annual economic value of informal family care estimated at $196 billion in 1997 (Arno, Levine, & Memmott, 1999). Alzheimer's disease costs American businesses more than $61 billion annually, primarily attributable to lost productivity of family caregivers. The average lifetime cost per patient is estimated to be $174,000, with paid care at home averaging $19,000 per year per patient and nursing-home care averaging $42,000 per year (Alzheimer's Association, 2006; Rice et al., 1993).

Research

The Alzheimer's Association is the only national voluntary health organization dedicated to research for the causes, cures, treatment, and prevention of Alzheimer's disease and to providing education and support services to affected individuals and their families. The national Alzheimer's Association, headquartered in Chicago and with a public policy office in Washington, DC, operates through a network of more than 200 local and area chapters. Chapters sponsor support groups, publish newsletters, run volunteer telephone helplines, and provide education and support to patients, families, and health and social service professionals caring for persons with Alzheimer's disease.

Funding biomedical research through both Alzheimer's Association funds and at the National Institutes of Health is at the top of the association's federal agenda. Since 1990, the Association has been successful in boosting federal research funding from $146 million to about $647 million, and the association itself has funded more than $185 million in research grants since 1982.

The association's vision is to create a world without Alzheimer's disease while optimizing quality of life for individuals and their families. The organization has moved over time from a sole focus on family support to a broader focus on individuals with Alzheimer's. There is now good evidence of a long latent or preclinical phase of Alzheimer's disease before symptoms develop and new evidence that persons with mild cognitive impairment are at high risk of converting to Alzheimer's in 3 years. With earlier diagnosis, more persons are diagnosed at a point of insight, and their families are looking for support programs that focus on the patient as well as the family.

The year 2005 marked the 25th anniversary of the Alzheimer's Association. A primary goal of the Alzheimer's Association is to mobilize worldwide resources, set priorities, and fund select projects for biomedical, social, and behavioral research. In 2000, the Alzheimer's Association led and directed the World Alzheimer Congress, a first world congress joining an international Alzheimer's research conference with the annual meeting of Alzheimer's Disease International, the international federation of 50 countries' Alzheimer's Societies.

Public Policy

Other goals of the Alzheimer's Association are to promote, develop, and disseminate educational programs and guidelines for health and social service professionals; to increase public awareness and concern for the impact of Alzheimer's disease on individuals and families in a diverse society; and to expand access to services, information, and optimal care techniques. Current programs focus on personalized knowledge services through toll-free lines, the Internet and publications, and care-coordination services on the local level.

Perhaps the greatest success of this voluntary organization has been its public policy coalitions and extensive federal, state, and local advocacy networks that promote legislation responsive to the needs of individuals with Alzheimer's disease and their families. An annual public policy conference provides opportunities for family advocates from the entire country to meet with elected representatives to discuss a national program to conquer Alzheimer's disease. A state-policy clearinghouse tracks long-term care and other legislation at the state and local level that affects Alzheimer's families.

The Chicago office of the national Alzheimer's Association houses the Green–Field Library, publishes research and practice updates for physicians and consumers, coordinates Memory Walks as a national fundraising and awareness program, and hosts an annual educational conference for care professionals. A national toll-free hotline (800-272-3900) and Web site (www.alz.org) link families and professionals to local and area chapters and support groups.

EDITORIAL STAFF

See also

Dementia: Nonpharmacologic Therapy
Dementia: Pharmacologic Therapy
Dementia: Special Care Units
Wandering

Internet Resource

Alzheimer's Association
http://www.alz.org

REFERENCES

Alzheimer's Association (2006). Statistics about Alzheimer's disease. Available at http://www.alz.org/AboutAD/statistics.asp

Arno, P. S., Levine, C., & Memmott, M. M. (1999). The economic value of informal caregiving. *Health Affairs*, *18*(2), 182–188.

National Center for Health Statistics (1998). *Health, United States, 1998*. Hyattsville, MD: National Center for Health Statistics.

Ory, M. G., Jr., Hoffman, R. R., Yee, J. L., Tennstedt, S., & Schulz, R. (1999). Prevalence and impact of caregiving: A detailed comparison between dementia and nondementia caregivers. *The Gerontologist*, *39*, 177–185.

Rice, D. P., Fox, P. J., Max, M., Webber, P. A., Lindeman, D. A., Hauck, W. W., & Segura, E. (1993). The economic burden of Alzheimer's disease. *Health Affairs*, *12*(2), 164–176.

Schulz, R., & Beach, S. R. (1999). Caregiving as a risk factor for mortality: The Caregiver Health Effects Study. *Journal of the American Medical Association*, *282*(23), 2215–2219.

ALZHEIMER'S DISEASE

See
Cognition Instruments
Cognitive Changes in Aging
Dementia: Nonpharmacologic Therapy
Dementia: Overview
Dementia: Pharmacologic Therapy
Dementia: Special Care Units
Psychiatric Diagnosis and the DSM-IV-TR
Wandering

AMERICAN ASSOCIATION OF HOMES AND SERVICES FOR THE AGING

The American Association of Homes and Services for the Aging (AAHSA) is the national nonprofit organization representing more than 5,600 nonprofit nursing homes; continuing care retirement communities; and assisted-living, housing, and community service organizations for the elderly.

Through advocacy, grassroots action, and coalition work, AAHSA influences public policy pertaining to health, housing, community, and related services to ensure that aging populations receive the services they need and to protect and enhance the viability of nonprofit providers. AAHSA also offers members information and assistance in interpreting relevant bills, laws, and regulations.

AAHSA offers timely newsletters, publications, and other communications to keep members up to date on congressional and regulatory actions and other trends and issues in the field of aging services.

AAHSA provides education and training in a variety of formats designed to meet the diverse informational needs of professionals in the aging-services field. AAHSA's annual meeting and exposition is highly acclaimed for its extensive curriculum. The continuing education program offers more than 175 concurrent sessions, special symposia, and intensive workshops. The exposition enables participants to view hundreds of the latest products and services. AAHSA's annual spring conference and exposition, held in Washington, DC, combines reports on the latest developments in public policy with intensive educational programs. The public policy and educational components are enhanced by visits to members of Congress. Stand-alone seminars focus on topics of major concern to members and permit comprehensive examination of issues vital to the effective management of nonprofit organizations. The Retirement Housing Professionals Certification Program provides professional recognition and management training in the administrative, property management, and human services aspects of retirement housing.

The AAHSA Development Corporation provides consultation to members on development planning and assists members in obtaining project financing. Its publications and educational programs keep members informed on various capital-formation techniques and resources.

EDITORIAL STAFF

See also
Assisted Living
Continuing Care Retirement Communities
Nursing Homes

Internet Resource
American Association of Homes and Services for the Aging
http://www.aahsa.org

AMERICAN FEDERATION FOR AGING RESEARCH

The American Federation for Aging Research (AFAR) is dedicated to research into the fundamental processes of aging, or biogerontology, that holds out the promise of extending healthy life and finding cures for diseases that accompany old age. This hope is based on the accelerating pace of scientific discovery and the commitment of new scientists, like those funded by AFAR, who dedicate their career to answering the fundamental questions of how and why we age.

Since 1981, AFAR, through its own privately funded grants and other administered programs, has granted $87 million to more than 2,100 talented researchers to help them begin and further careers in aging research and geriatric medicine. AFAR fulfills its mission to promote healthier aging through biomedical research by (1) supporting research that furthers our understanding of the aging process and its associated diseases and disorders; (2) building a cadre of new and young scientists in aging research and geriatric medicine; (3) offering opportunities for scientists and physicians to exchange new ideas and knowledge about aging; and (4) promoting awareness among the general public about the importance of aging research.

EDITORIAL STAFF

Internet Resource

American Federation for Aging Research
http://www.afar.org

AMERICAN GERIATRICS SOCIETY

The American Geriatrics Society (AGS) is a leading professional organization of health care providers dedicated to improving the health and well-being of all older adults. With an active membership of more than 6,800 health care professionals, the AGS has a long history of effecting change in the provision of health care for older adults. In the last decade, the society has become a pivotal force in shaping attitudes, policies, and practices regarding health care for older people.

In 1942, a group of physicians interested in advancing medical care for older adults met with the intention of forming a specialty society dedicated to geriatric medicine. At this inaugural meeting, the founding membership of the AGS decided that any physician with an interest in geriatrics who had graduated from a recognized medical school and was a member in good standing of a state medical society would be eligible to join the society.

The AGS promotes high-quality, comprehensive, and accessible care for America's older population, including those who are chronically ill and disabled. The organization provides leadership to health care professionals, policy makers, and the public by developing, implementing, and advocating programs in patient care, research, professional and public education, and public policy. In response to the many challenges that a rapidly aging population poses, the AGS has established the Foundation for Health in Aging (FHA). The FHA's goals are to build a bridge between geriatrics health care professionals and the public and to advocate on behalf of older adults and their special needs: wellness and preventive care, self-responsibility and independence, and connections to family and community.

EDITORIAL STAFF

Internet Resources

American Geriatrics Society
http://www.americangeriatrics.org

Foundation for Health in Aging
http://www.healthinaging.org

AMERICAN HEALTH CARE ASSOCIATION

The American Health Care Association (AHCA) is a nonprofit federation of affiliated state health organizations, together representing more than 10,000 nonprofit and for-profit assisted-living, nursing-facility, developmentally disabled, and subacute-care providers that care for more than 1.5 million elderly and disabled individuals nationally.

At its Washington, DC, headquarters, the association maintains legislative, regulatory, and public affairs and member services staffs that work both internally and externally to assist the interests of government and the general public, as well as member providers. In that respect, AHCA represents its membership to all publics and national leadership to its members.

AHCA provides educational, informational, and administrative tools to consumers of long-term care, providers, health care professionals, regulators, and policy makers. Daily and monthly electronic updates on the AHCA Web site and print newsletters and journals (i.e., *AHCA Gazette*, *Hot Issues*, and *Provider Magazine*) distill current clinical and health services research and issues, proposed legislation, and statistical data for all members of its public, professional, and industry constituency.

The annual national conference invites participants to special seminars, presentations, and poster sessions on issues affecting long-term care. Many of the sessions are approved for continuing-education credit. Regulators and policy makers participate in many of the informational sessions, describe new initiatives, and hear the concerns of providers.

Research is supported, conducted, and disseminated through the Research and Information Service and includes impact assessments of current and proposed public policy; regulatory compliance reports; publication of Facts and Trends, an annual compilation of data about residents in assisted-living, nursing-home, and subacute-care facilities; utilization and expenditure reports; and quality initiatives.

Clinical practice guidelines for use by member organizations and others were created by AHCA in collaboration with the American Medical Directors Association. A scholarship program is specifically maintained for student nurses in registered nursing or licensed practical or vocational training programs. The National Council of Assisted Living (NCAL) is a program affiliate of AHCA dedicated to representing the needs and interests of residents of assisted-living facilities and their owner-operators. NCAL is a resource for legislative updates and quality guidelines for assisted living, model consumer agreements, and by-state listings of providers and has an active informational and advocacy role in assisted living.

AHCA is committed to developing necessary and reasonable public policies that balance economic and regulatory principles to support quality care and quality of life, and it is dedicated to professionalism and ethical behavior among all who provide long-term care.

EDITORIAL STAFF

Internet Resource

American Health Care Association
http://www.ahca.org

AMERICAN INDIAN ELDERS

American Indian and Alaska Native is a collective term describing more than 561 nations, tribes, bands, and native villages that are "federally recognized" (i.e., have a legal relationship with the U.S. federal government based on treaties, acts of Congress, exclusive acts, or other governmental processes) and more than 150 indigenous groups that do not benefit from federal recognition, even if state recognition has been conferred. Each sovereign tribe establishes its own standards of membership. This diversity is reflected in differences in culture, lifestyle, health status, health risks, and the experience of aging with chronic disease.

The 2000 U.S. Census reports that 1.5% of the U.S. population claims American Indian and Alaska Native ancestry, including 2.5 million who reported their ancestry alone and another 1.6 million who reported their ancestry in combination with another race; overall, 79% reported a tribal affiliation (Ogunwole, 2002). Although a small segment of the overall U.S. population, the number of

Native Americans is growing. Between the 1990 and the 2000 censuses, the all-age population of American Indians and Alaska Natives increased between 26% (single race) and 110% (in combination with another race, which had not been previously enumerated).

"Elder" refers to a social or physical status, not necessarily a chronological age, and the role of an elder is imbued with positive value and with an active engagement in maintaining and transmitting cultural values. As early as age 45, American Indians share similar health and human services needs as other Americans age 65 and older. The implications are that some Native American "elders" in their own communities may not be eligible for Medicare or other support services when such assistance is first needed. In keeping with community definitions, the Indian Health Service (IHS) and the Tribal Elder Care Initiative define elders as persons who are 55 years and older (USDHHS, 2005). Although the proportion of elders (11%) is about half that of the U.S. population in general (21%), the number of elders has been steadily increasing. The IHS projected an increase of more than 26% among its user population from 1990 to 2005. Since the 1970s, life expectancy at birth has increased by 15%, or more than 10 years, and is about 3 years less than U.S. All Races. Life expectancy in 1994–1996 was calculated at 73.2 years, adjusted for miscoding of race on death certificates.

Access to Health Care

Access to health care varies with residential location and government recognition of tribal status. The U.S. government is obligated to provide health care for federally recognized tribes as part of its Trust Responsibility and under treaty laws. Health care is provided to members of federally recognized tribes living on or near federal reservations, trust territories, historic Indian areas in Oklahoma, and Alaska Native villages by the IHS, a branch of the U.S. Public Health Service, or tribally operated programs under agreements with the IHS. The IHS is not an entitlement program and its services are based on annual funding authorized by Congress. The IHS does not directly provide long-term care, and contract funds are limited. IHS administrative data are aggregated for periodic "chart book" publications, which are available on-line through the IHS; this information is often generalized to the entire population regardless of IHS enrollment status.

More than half of the total American Indian population, including elders, live in urban areas. Although IHS operates clinics in a few selected urban areas, most urban-dwelling American Indians and Alaska Natives have the same access to health care as all older Americans, depending on their ability to pay for private providers or eligibility for state and local health departments and for Medicaid or Medicare. Virtually all urban American Indian elders were born on or near reservations but migrated after World War II to cities, where they worked, raised their families, and retired, and where most maintain permanent residence. It appears that relatively few elders return to their home reservations; however, some individuals may travel to home reservations for health care as well as for cultural and family reasons.

Mortality, Chronic Diseases, and Intervention Strategies

Mortality varies by age cohort, as might be expected. Rates for the "younger" group of elders (i.e., ages 55–64) differ from all other American Indians and Alaska Natives and from the general U.S. population. For these elders, the leading causes of death are diseases of the heart, malignant neoplasms (e.g., prostate cancer deaths occur at higher rates than in the general population), diabetes, and chronic liver disease and cirrhosis; the leading causes for U.S. All Races are malignant neoplasms, diseases of the heart, chronic obstructive pulmonary disease, and cardiovascular disease. The two leading causes of death for all Americans older than age 65, including American Indians and Alaska Natives, are diseases of the heart and malignant neoplasms. The top four cancer sites are the same as with U.S. All Races (i.e., trachea, brochus, lung; colon; prostate;

and female breast); the seventh and eighth leading sites for American Indians and Alaska Natives (i.e., stomach and kidney, respectively) exceed U.S. All Races. Diabetes mellitus is the third leading cause of death for American Indians and Alaska Natives older than age 65, whereas cerebrovascular disease is the third leading cause of death among Americans of All Races in this age cohort.

Autoimmune and other chronic diseases have an earlier onset and higher prevalence rates in American Indian populations (Kramer, 1997). During the last half of the 20th century, changes in technology, diet, exercise, and lifestyle have introduced new risk factors for diseases, in particular for diabetes and its associated complications, hypertension, rheumatoid diseases, and cancer. Up-to-date research is most easily accessed on the National Library of Medicine Web sites devoted to American Indian health. Model intervention programs have focused on primary and secondary prevention and risk-reduction strategies (e.g., education on exercise and diet) that generally recognize tribal-specific variations in health risks and health behaviors. Successful methods often engage traditional values of respect and authority for older role models and spokespersons, oral transmission of knowledge, nonintrusive guidance, and importance of family and community continuity. Although few articles focus on elders, a bibliography of peer-reviewed health research for this special population has been organized by the National Library of Medicine and is available at http://www.americanindianhealth.nlm.nih.gov.

Health information about urban American Indian and Alaska Native elders and cohort of all ages is limited to cross-sectional studies, which report that these communities have poorer health and functional status, across virtually all measures, than the general population or their reservation counterparts (Kramer, 1997). Recent studies in one urban area documented that elders (i.e., older than 50 years) have high prevalence rates of diabetes mellitus (21%) and hypertension (38% diagnosed and 23% possible undiagnosed) (Rhoades & Buchwald, 2003; Rhoades, Roubideaux, & Buchwald, 2004).

Treating the Indian Patient

Successful therapeutic relationships are based on establishing an interest in the patient's well-being and often require a cultural assessment. Clinicians should not underestimate the sophistication of American Indian clients, who may enjoy the same broadcast and print media as other American patients. Traditional etiquette may call for avoidance of eye contact, firm handshakes, and direct questions and responses; these behaviors indicate respect in Indian cultures and should not be mistaken for furtiveness. Silence may indicate responsiveness rather than avoidance or hostility. Conversational silences allow both parties time for reflection to absorb information and to formulate a thorough response; they indicate respect for the serious nature of the business at hand. A calm, accepting, nonjudgmental approach is appreciated in establishing a trusting relationship, which may take more than one visit.

Obtaining advance directives (ADs) is often a difficult and lengthy process, stymied in part by institutional protocols that require written consent to a formal, witnessed document processed by staff with whom patients may not have an established relationship. End-of-life treatment decisions tend to favor natural approaches and accept the inevitability of death. A cultural assessment is a key factor in orienting the discussion on ADs. Clinicians should be aware of the spiritual healing that patients and families may desire to accompany treatment. When elders can no longer speak for themselves, a family proxy (whose role may reflect the indigenous social structure) usually emerges to express what should be accepted as the authentic wishes of the patient if these have not been previously determined with the provider (Hepburn & Reed, 1995; Kramer, 1996).

B. JOSEA KRAMER

See also
Cultural Assessment
Cultural Competence and Aging

Internet Resources

Indian Health Service
http://www.ihs.gov

MedLine Plus
http://www.nlm.nih.gov/medlineplus/nativeamericanhealth.html

National Library of Medicine
http://www.ihs.gov/nonmedicalprograms/ihs%5Fstats/ihs%5Fhq%5Fpublications.asp

National Indian Council on Aging
http://www.nicoa.org/

National Resource Center on Native American Aging
http://www.med.und.nodak.edu/depts/rural//nrcnaa/

U.S. Department of Commerce, U.S. Census Bureau, The American Indian and Alaska Native Population: 2000
http://www.census.gov/population/www/cen2000/briefs.html

REFERENCES

Hepburn, K., & Reed, R. (1995). Ethics and cultural issues with Native American elders: End-of-life decision making. *Clinics in Geriatric Medicine*, *11*, 97–111.

Kramer, B. J. (1996). *American Indians.* In S. Dibble (Ed.), *Culture and nursing care: A pocket guide* (pp. 11–22). Berkeley: University of California Press,.

Kramer, B. J. (1997). Chronic disease in American Indian populations. In K. Markides and M. Miranda (Eds.), *Minorities, aging and health and aging* (pp. 181–202). Thousand Oaks, CA: Sage Publications.

Ogunwole, S. U. (2002). *American Indians and Alaska Natives. Census 2000 Brief.* U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau.

Rhoades, D. A., & Buchwald, D. (2003). Hypertension in older urban Native American primary care patients. *Journal of the American Geriatrics Society*, *51*, 74–81.

Rhoades, D. A., Roubideaux, Y., & Buchwald, D. (2004). Diabetes care among older urban American Indians and Alaska Natives. *Ethnicity and Disease*, *14*, 574–579.

U.S. Department of Health and Human Services, Indian Health Service, Office of Public Health, Office of Program Support, Program Statistics Team (2005). *Elders 1998–1999.*

U.S. Department of the Interior (2005). Bureau of Indian Affairs, Indian Entities Recognized and Eligible to Receive Services From the United States Bureau of Indian Affairs, *Federal Register Vol. 70, No. 226 / Friday, November 25*, 71194-98.

AMERICAN MEDICAL DIRECTORS ASSOCIATION

The American Medical Directors Association (AMDA) is the professional association of medical directors and physicians practicing in long-term care, dedicated to excellence in patient care by providing education, advocacy, information, and professional development.

Founded in 1975, the AMDA is a national organization representing more than 8,000 medical directors and other physicians who practice in long-term-care settings. AMDA is committed to the continual improvement of the quality of patient care by providing education, advocacy, information, and professional development for medical directors and other physicians. Although the association's name reveals its origins, the reality is that AMDA has always served the interests of both medical directors and attending physicians.

Among AMDA's many accomplishments are its public policies for improved care. These policies include the establishment of the Certified Medical Director Program to demonstrate competence in both clinical medicine and medical direction and administrative responsibilities. It has also worked to improve standards in federal nursing facilities, contributing to the passage of the 1987 Nursing Home Reform Act. To help clinicians more directly, AMDA develops information kits and organizes national symposia to aid in the efforts to improve the long-term care of the elderly.

EDITORIAL STAFF

Internet Resource

American Medical Directors Association
http://www.amda.com

AMERICAN NURSES ASSOCIATION

The American Nurses Association (ANA) is the only full-service professional organization representing the nation's 2.9 million registered nurses (RNs) through its 54 constituent member associations. Dedicated to ensuring that an adequate supply of highly skilled and well-trained nurses is available, the ANA is committed to meeting the needs of nurses as well as health care consumers. The ANA advances the nursing profession by fostering high standards of nursing practice, promoting the economic and general welfare of nurses in the workplace, projecting a positive and realistic view of nursing, and lobbying Congress and regulatory agencies on health care issues affecting nurses and the general public. The ANA also publishes *American Nurse* and maintains a Web site.

The three ANA-affiliated organizations are the American Nurses Foundation, the American Academy of Nursing, and the American Nurses Credentialing Center. The American Nurses Foundation was founded in 1955 as the research, education, and charitable affiliate of the ANA. The foundation complements the work of the ANA by raising funds and developing and managing grants to support advances in research, education, and clinical practice. The American Academy of Nursing is an organization of distinguished leaders in nursing who have been recognized for their outstanding contributions to the profession and to health care. The ANA established its certification program in 1973 to provide tangible recognition of professional achievement in defined functional or clinical areas of nursing. To date, more than 150,000 nurses have been certified in 29 specialty areas. The American Nurses Credentialing Center bases its programs on the standards set by the ANA Congress of Nursing Practice.

EDITORIAL STAFF

Internet Resource

American Nurses Association
http://www.nursingworld.org

AMERICAN SOCIETY ON AGING

The American Society on Aging (ASA) was founded in 1954. It is an association of individuals bound by a common goal: to support the commitment and enhance the knowledge and skills of those who seek to improve the quality of life of older adults and their families. No other organization in the field of aging represents the diversity of settings and professional disciplines reached by ASA.

ASA is founded on the premise that the complexity of aging in our society can be addressed only as a multidisciplinary whole. The membership of ASA is an array of researchers, practitioners, educators, businesspeople, and policy makers who are concerned with the physical, emotional, social, economic, and spiritual aspects of aging. Thousands of professionals throughout the country rely on ASA to keep them on the cutting edge in an aging society. Through educational programming, publications, and state-of-the-art and training resources, ASA members tap into the knowledge and experience of the largest and most dynamic network of professionals in the field of aging.

Professional Education and Publications

ASA publications offer current information and research to help professionals stay on the cutting edge in the field of aging: *Aging Today* is newspaper-format bimonthly coverage of all the issues facing professionals in aging today; *Generations* is a scholarly quarterly journal; and *ASA Connection* is an on-line update of issues facing ASA and the field of aging.

Awards Programs

ASA hosts a variety of award programs honoring individuals and organizations that are making a difference in the lives of older adults. See ASA Awards (http://www.asaging.org/asav2/awards/) for more information.

EDITORIAL STAFF

Internet Resource
American Society on Aging
http://www.asaging.org

AMERICANS WITH DISABILITIES ACT

Legal protection for elderly persons takes many forms, including protection from discrimination in employment and housing, elder abuse in nursing homes and other settings, and in the provision of public benefits. One less obvious source of legal protection for elderly persons is the Americans with Disabilities Act of 1990 (ADA) and its sister federal, state, and local disability-discrimination-protection statutes.

Of course, being elderly is not synonymous with being disabled. Nonetheless, many needs of elderly persons are touched and perhaps addressed by the ADA and related statutes. For that reason, a working knowledge of the disability laws is essential for those working in the field of elder care.

The ADA prohibits discrimination in private employment and in public accommodations settings. The rights that the ADA affords disabled persons in each setting are quite distinct.

ADA Application to the Employment Setting

The ADA applies to employers with 15 or more employees as well as to state and local governments, employment agencies, and labor unions. The statute protects a qualified individual with a disability. To be a qualified individual, the applicant or employee must have the skills, experience, and education necessary to perform the essential functions of the job with or without a reasonable accommodation.

Definition of Disability

Disability is defined as a mental or physical impairment that substantially limits a major life activity or the record or perception by the employer of the individual having such an impairment. A record of an impairment could be, for example, a history of cancer. An example of a perception could be the assumption that a homosexual employee has or will be exposed to the AIDS virus.

Major life activities, for purposes of the ADA, include caring for oneself, performing manual tasks, walking, seeing, hearing, speaking, breathing, learning, working, sitting, standing, thinking, concentrating, and interacting with others. The determination of whether an impairment substantially limits a major life activity, which is required under the ADA for the statute's protection to be triggered, depends on a number of factors, including the severity and expected duration of the impairment and its long-term impact on the individual.

Exclusions from the definition of disability include (http://www.dlrp.org/html/topical/Disability/Dis_definition.html) (1) temporary illnesses or injuries (e.g., broken bones) because the temporary nature of the condition is deemed not to substantially limit a major life activity; (2) current users of illegal drugs; (3) compulsive gambling or sexual behavioral disorders.

Duty to Accommodate

One of the key elements of the ADA is the duty it imposes on employers to reasonably accommodate a disabled applicant or employee. An employer's duty to reasonably accommodate the needs of qualified applicants and employees can be quite substantial. Examples of reasonable accommodations include (1) making existing facilities readily accessible to and usable by disabled individuals; (2) acquiring or modifying equipment and devices; (3) providing ergonomically correct furniture; (4) adjusting and modifying tests, training materials, and policies; (5) restructuring jobs to reallocate marginal job functions; (6) modifying work schedules; (7) providing leaves of absence; (8) reassigning disabled employees to vacant positions; and (9) providing qualified readers with interpreters and personal assistants.

The ADA requires that the process of determining the appropriate accommodation be interactive and with the employee's full participation. An employer is not obligated, however, to necessarily adopt a specific accommodation proposed by the applicant or employee but must merely implement a reasonably effective option among viable alternatives that will permit the individual to perform the essential functions of the position. In providing an accommodation, an employer is not obligated to eliminate an essential function of the job. For example, an employer would not be required to eliminate the obligation for a truck driver to drive in order to accommodate that employee's visual impairment.

The duty to accommodate is often straightforward when the disability is physical. A more difficult issue is posed when the disability is mental or emotional. For example, must an employer excuse the erratic behavior of a clinically depressed employee? The answer is, as with many issues arising in the disability area, quite fact-intensive and dependent on a number of factors, including whether the employee's condition rises to the level of a disability, the severity of the condition, and the employee's ability (with or without an accommodation) to perform the essential functions of the job.

Medical Examinations

The ADA prohibits employers from requiring or giving medical examinations prior to making an offer of employment. Once a job offer has been made, an employer may condition actual employment upon the passing of a medical examination. To be lawful, the post-offer examination must be required of all entering employees in the same job category. The ADA also prohibits employers from inquiring into the physical or mental condition of a job applicant whether by questionnaire, application, or interview.

An employer's discretion in requiring that existing employees submit to medical examinations is also limited to situations in which the examination is necessary to determine fitness for duty or where there is evidence of a performance or safety problem. A fitness-for-duty test, such as lifting and carrying a heavy weight for a firefighter, measures the employee's ability to perform the essential functions of the position. Post-employment medical examinations are also permitted when the examination is performed to monitor compliance with federal, state, or local laws. Medical examinations may also be conducted as part of a voluntary health program as long as the information obtained is not used in violation of the ADA. Information obtained from a post-offer medical examination must be maintained in a separate medical file and must be treated as a confidential medical record.

Related Federal, State, and Local Laws

In addition to the ADA, many other federal, state, and local laws provide significant protections against disability discrimination. The Vocational Rehabilitation Act of 1973 applies to employers receiving federal contracts in excess of $2,500 and to participants in federally funded programs. The act provides many of the same protections for disabled employees as the ADA.

Most states have human rights or civil rights laws that provide the same and often additional protections for disabled individuals. For example, many state laws apply to smaller employers with fewer employees (e.g., 4 employees) in contrast to the 15 employees required by the ADA, protect a broader range of disabilities (e.g., include temporary disabilities), and provide a wider range of damages (e.g., unlimited compensatory and punitive damages). Some localities, such as New York City, have equivalent laws.

ADA Application to Public Accommodations

The ADA also prohibits covered entities from discriminating in the provision of services and access to their facilities against individuals with disabilities. This means that entities must provide to disabled and nondisabled customers, patients, and clients the same type and quality of care, services, and access to their facilities.

Covered entities deemed to be public accommodations include but are not limited to hotels, restaurants, theaters, retail stores, medical and professional offices, hospitals and nursing homes, schools, and sports and entertainment venues.

Covered entities must make reasonable modifications in policies, practices, and procedures as needed so that individuals with disabilities can make full use of the services provided or the facilities. For example, a visually impaired individual must be permitted to be accompanied by a guide dog even if animals are not normally permitted on the premises. Covered entities must also furnish aids and services to ensure effective communication with the disabled individual. For example, schools may be required to provide and pay for a sign-language interpreter or to translate a document into braille. The entities cannot charge the users of these auxiliary aids and services to cover their added costs.

Covered entities must remove structural, architectural, and communications barriers in their facilities where such removal is "readily achievable," which means that it can be easily carried out without much difficulty or expense. Examples of such efforts include installing wheelchair ramps, widening doorways, installing grab bars near toilets, replacing sink handles, installing flashing emergency alarm lights, and providing special seating areas in theaters and sports arenas.

Disabilities Laws and the Elderly

The goal of the ADA is to fully integrate disabled people into the general sweep of society. This goal is particularly applicable and noble with the elderly in mind.

An elderly applicant or employee is entitled to the full protection afforded by the ADA. An elderly employee whose medical condition limits his ability to perform tangential, nonessential tasks may call upon the ADA for protection if the employer seeks to terminate that employee's employment as a result of his inability to perform these nonessential tasks. An applicant with a medical history of a disabling condition may not be judged on that history but rather must be evaluated on his current ability to perform the essential functions of the job.

Elderly persons may also not be denied access to public accommodations due to a disabling condition. Restaurants and theaters must be fully accessible to disabled individuals. Public transportation as well must be accessible.

Anyone seeking to assert rights under the ADA and its sister laws may do so in court or before the Equal Employment Opportunity Commission or its state and local equivalent agencies. Resorting to legal proceedings may not always be required. The ADA's far-reaching goals for American society have yet to be fully implemented in the employment and public accommodations settings. There are many reasons for this, with ignorance of its mandates as the most prominent. The first step in any effort to seek the protection of the ADA is notification of the offending employer or entity of the ADA issue and a request for relief or an accommodation. It is only after voluntary, cooperative efforts fail that resorting to legal remedies is warranted.

Alfred G. Feliu

See also

Environmental Modifications: Home
Environmental Modifications: Institutional

Internet Resources

Americans with Disabilities Act
http://www.ada.gov

ADA Project
http://www.adaproject.org/

ANEMIA

Anemia in an elderly person (i.e., hemoglobin less than 12 g/dl in women, less than 13 g/dl in men) (Nierodzik, Sutin, & Freedman, 2002) should be viewed as a sign, not a disease. Anemia is not a part of normal aging. Normal parameters for the complete blood count (CBC) indices can be used. The first step in treatment is to find the underlying disease that is causing the anemia. The main causes of chronic anemia in the elderly are iron deficiency, vitamin B_{12} or folate deficiency, myelodysplastic syndromes, and anemia of chronic disease. This discussion focuses on the main causes, diagnosis, and treatments of chronic anemia in the elderly.

Diagnosis

Presenting symptoms of anemia may include fatigue, exertional shortness of breath, anginal chest pain, palpitations, dizziness, syncope, or a change in mental status. The physical signs of anemia include pallor (especially in the mucous membranes), tachycardia, systolic ejection murmur, and a widened pulse pressure. The speed at which the signs and symptoms develop is often a clue to the acuteness of the condition. To rule out an acute gastrointestinal bleed, a rectal exam must be done to characterize the nature of the stool; a guaiac test should be done to check for occult blood. Clinicians should try to elicit a history of melena or other change in bowel habits. Follow-up should include monitoring vital signs and stools for occult blood (on three or more separate occasions).

The initial laboratory test is a CBC that not only reports the hemoglobin and hematocrit levels but also provides information on the size and shape of the red blood cells (RBCs). Additional tests that may be helpful in the initial workup are ferritin, iron, total iron-binding capacity, vitamin B_{12}, folate, lactate dehydrogenase, indirect bilirubin, serum protein electrophoresis, and reticulocyte count. Classically, anemia is characterized by the size and appearance of the RBCs seen on the peripheral smear (i.e., microcytic, normocytic, macrocytic) and by the rate of RBC production, as indicated by the reticulocyte count and reticulocyte production index. After the anemia is classified by these indices, the differential diagnosis identifies the disease behind the anemia. Bone-marrow examination may be necessary if the diagnosis is not clear from patient history, physical examination, and standard blood tests, and it is required when the anemia is secondary to a malignancy such as leukemia, lymphoma, and multiple myeloma. A bone-marrow examination is also usually necessary to establish the diagnosis of myelodysplasia.

Microcytic Anemias

A mean corpuscular volume (MCV) less than 80 fl indicates a microcytic anemia. Iron deficiency, thalassemia, sideroblastic anemia, and some cases of anemia of chronic disease present in this fashion.

Normocytic Anemias

An MCV of greater than 80 and less than 100 fl falls within the normocytic range. The differential diagnosis in this category includes anemia of chronic disease, intrinsic marrow disease (e.g., aplasia or malignancy), and acute blood loss or hemolysis. The finding of a normal MCV may be a confounding factor because it may represent a combination of microcytic and macrocytic processes or an early stage in the development of the anemia. The range distribution width can be a clue in this situation; for example, a range distribution width greater than 15 indicates that the RBC population is heterogeneous and that a combination of factors may be at work.

Macrocytic Anemias

Anemias that present with an MCV greater than 100 fl include megaloblastic anemia (i.e., vitamin B_{12} or folate deficiency), chronic liver disease, alcoholism, hypothyroidism, some cases of myelodysplastic syndrome, and conditions with increased reticulocytes.

Treatments

Acute Gastrointestinal Bleed

If an acute bleed is discovered, the patient must be admitted to the hospital; a patient with signs of shock, tachycardia, or orthostatic hypotension should be in a monitored setting, such as an intensive care unit. In general, an elderly patient with a hemoglobin less than 8 g/dL or hematocrit less than 25% should be considered a candidate for a blood transfusion of packed RBCs. Similarly, if the patient presents with obvious signs of hemorrhage or end-organ damage, such as chest pain or severe dyspnea, with a hemoglobin less than 10 g/dL, an immediate transfusion should be considered. In the very aged (i.e., those older than age 85) and those with a history of congestive heart failure, transfusions should be administered as half units (i.e., 125 mL) to run over 3 to 4 hours. In addition, 10 mg of furosemide may be given intravenously with each unit to prevent fluid overload.

Iron Deficiency

Iron-deficiency anemias are characterized by microcytosis, low ferritin level (i.e., less than 30 ng/mL), low iron, high total iron-binding capacity, high range distribution width (i.e., greater than 15), and low reticulocyte index (i.e., less than 2%). Iron deficiency in the elderly can be caused by inadequate nutrition, achlorhydria, or most commonly from chronic blood loss. In a study of 100 patients with iron-deficiency anemia, endoscopic examination of the upper gastrointestinal tract found a lesion in 36 patients (19 peptic ulcers); colonoscopy showed a lesion in 25 (colon cancer in 11) (Rockey & Cello, 1993). The finding of iron deficiency, therefore, warrants a workup of the gastrointestinal tract, including upper- and lower-tract endoscopy.

Treatment consists of iron supplements taken orally; in emergencies or when iron cannot be given orally, iron dextran may be given. Oral iron is available in several formulations: ferrous sulfate—usually 325 mg once a day (which is equivalent to 65 mg of elemental iron)—ferrous gluconate, ferrous fumarate, and ferrous polysaccharide. Because ferrous sulfate is constipating, a stool softener such as docusate is recommended. Ferrous polysaccharide (Niferex 150 mg) is less constipating and has once-daily dosing, making it a good choice in elderly people. Vitamin C administered with the iron can help maintain the iron in its reduced state and improve absorption.

Parenteral iron therapy may be used when the patient is unable to absorb oral iron adequately or in sufficient doses. Iron dextran can be given either intramuscularly or intravenously. A test dose of 0.5 ml should be administered intravenously to ensure that anaphylactic shock does not occur.

Thalassemias

The thalassemias are hereditary disorders characterized by low MCV (often less than 70 fL); target cells on peripheral smear; low reticulocyte index; normal range distribution width; and normal iron, ferritin, and total iron-binding capacity. The form most likely to be encountered in the elderly population is thalassemia minor. No treatment is required, and iron therapy is contraindicated because it may produce iron overload.

Myelodysplastic Syndromes

The myelodysplastic syndromes are differentiated by normal or high ferritin, normal or elevated iron levels, and low reticulocyte index. Many patients have a low platelet or neutrophil count, indicating impaired hematopoeisis. In most cases, the etiology is unknown but, in some cases, there is a history of exposure to alkylating agents or radiation.

Treatment is often supportive, with transfusions as necessary. Sometimes patients with ringed sideroblasts respond to oral pyridoxine. Chemotherapy is often not effective in the treatment of these syndromes, and elderly patients are usually not candidates for stem-cell transplantation. In 25% of cases, the hematocrit will increase with erythropoietin injections.

Vitamin B_{12} Deficiency

This condition is characterized by macrocytosis, high range distribution width, and low reticulocyte index. In addition to causing anemia, vitamin B_{12} deficiency may also cause neurological damage, including dementia. Normal B_{12} levels (but less than 350 pg/ml) are often found in B_{12} deficiency and should be corroborated with elevated homocysteine and methylmalonic acid levels. B_{12} deficiency may arise due to a number of conditions such as a lack of gastric acid or pepsin so B_{12} cannot be freed from its binding to dietary proteins, an autoimmune disease with production of auto antibodies against parietal cells and intrinsic factor (i.e., pernicious anemia), bacterial overgrowth, and diseases of the terminal ileum.

The most efficient way to treat vitamin B_{12} deficiency due to pernicious anemia (auto antibodies to intrinsic factor) is with injections of 1,000 μg of vitamin B_{12} intramuscularly. There are a number of regimes of initial replenishment followed by maintenance therapy; a convenient one is to give the injections daily for 1 week, then weekly for 4 weeks, than monthly for life. The maintenance dose is 1,000 μg every month. Potassium and phosphate levels must be monitored during the initial stage of therapy. B_{12} may be given orally, especially if the B_{12} deficiency is due to a lack of acid or pepsin, and some patients with pernicious anemia respond to a high dose (1,000 μg/day) of oral B_{12}. Sublingual B_{12} is another form of the vitamin that is absorbed directly into the bloodstream and bypasses the gastrointestinal tract. Because the pernicious anemia form of B_{12} deficiency may be associated with gastrointestinal cancer, it is recommended that patients be monitored for this as well.

Folate Deficiency

This condition presents in a similar manner to vitamin B_{12} deficiency. When a macrocytic anemia is diagnosed and a folate deficiency is suspected, it is imperative that both B_{12} and folate levels, as well as homocysteine and methylmalonic acid levels, be checked. In folate deficiency, homocysteine may be elevated but the methylmalonic acid levels are normal. Replacing only folate in a patient who is also deficient in vitamin B_{12} can improve the anemia but fails to stop, and may worsen, the neurological sequelae of B_{12} deficiency. Treatment is 1 mg of folic acid orally once a day.

Anemia of Chronic Disease

This condition is normally a diagnosis of exclusion. Anemia of chronic disease is characterized by increased uptake and retention of iron within the cells of the reticuloendothelial system, which leads to diversion of iron from the circulation. A newly identified acute-phase protein hepcidin may play an important role in this (Guenter & Goodnough, 2005). Erythropoietin response is also often inadequate for the degree of anemia.

The characteristic findings are a low reticulocyte index, reduced iron, normal or reduced total iron-binding capacity, and normal or increased ferritin. Implicated diseases include chronic inflammatory disease such as in the collagen-vascular diseases, malignancy, chronic infections, or chronic renal disease.

A search should be made for correctable nutritional deficiencies (i.e., iron, B_{12}, or folate). Dementia, poverty, or elder abuse can contribute to nutritional inadequacy. In the case of collagen-vascular diseases and malignancy, the anemia often responds to treatment of the underlying illness. In refractory cases and in chronic renal disease, careful treatment with erythropoietin may be necessary, although there are concerns about its use in certain malignancies (Guenter & Goodnough, 2005). Erythropoietin is given intravenously to hemodialysis patients and subcutaneously to those not on dialysis. Recent findings indicate that some patients can be maintained on a once-a-week or, for certain formulations, every-other-week dosing administration.

DAVID SUTIN
MICHAEL FREEDMAN

TABLE A.1 Treatment of Anemia

Type of Anemia	Preferred Treatment
Iron deficiency	Ferrous polysaccharide (Niferex 150 mg) orally, once a day
Thalassemia minor	None
Myelodysplasia	Erythropoietin, or transfusion, as needed
Vitamin B_{12} deficiency	Maintenance: vitamin B_{12} 1,000 μg intramuscularly every month
Folate deficiency	Folic acid 1 mg orally once a day
Anemia of chronic disease	If refractory, erythropoietin

Internet Resources

American Family Physician
http://www.aafp.org/afp/20001001/1565.html

American Geriatrics Society
http://www.americangeriatrics.org/directory/ABIM/GRS/Hemat.htm

Doctor's Guide
http://www.pslgroup.com/dg/FD07A.htm

National Anemia Action Council
http://www.anemia.org/professionals/research/articles/anemia_in_elderly.jsp

WebMD
http://wwwwebmd.com/content/article/8/1680_54569.htm

REFERENCES

Guenter, W., & Goodnough, L. T. (2005). Medical progress: Anemia of chronic disease. *New England Journal of Medicine*, *352*, 1011–1024.

Nierodzik, M. L., Sutin, D., & Freedman, M. L. (2002). Blood disorders and their management in old age. In R. C. Tallis & H. M. Fillit, *Brocklehurst's textbook of geriatric medicine and gerontology* (6th ed., chap. 28). New York: Churchill Livingstone.

Rockey, D. C., & Cello, J. P. (1993). Evaluation of the gastrointestinal tract in patients with iron deficiency anemia. *New England Journal of Medicine*, *329*, 1691–1695.

ANIMAL-ASSISTED HEALTH CARE

The capacity of animals to assist in health care of disabled or chronically ill patients has long been regarded as vital and powerful. Much of the literature on this topic has consisted of clinical anecdotes and case reports. Although most reports of the therapeutic effects of animals in health care are primarily anecdotal, several empirically based studies have found that pet ownership or interaction with animals is associated with decreased stress and anxiety and improved cardiovascular health (Virues-Ortega & Buela-Casal, 2006).

Camp (2001) found that people with physical disabilities who had service animals reported enhanced independence in occupational performance areas and experienced improvements in psychosocial functioning. Human–animal therapies have been used to decrease postoperative pain in children, assist in drug-addiction and cancer therapies, enhance therapy with children with autism, and assist in socializing adults with schizophrenia (Kovacs, Kis, Rozca, & Rozca, 2004; Martin & Farnum, 2002; Sobo, Eng, & Kassity-Krich, 2006). Animal therapies have been used extensively with older adults, demonstrating beneficial effects in noncognitively impaired older adults (Colombo, Dello Buono, Smania, Raviola, & De Leo, 2006) and cognitively impaired older adults (Richeson, 2003). Palliative-care hospice settings provide yet another health care setting conducive for beneficial human–animal interactions (Brenner & Krenzer, 2003).

In modern animal-assisted health care, a variety of animals are used in a multitude of health settings. Although dogs and cats are most commonly associated with these programs, many other species are used, including rabbits, birds, pigs, fish, horses, dolphins, llamas, and even snakes. Breed and species are usually not the most important criteria for such programs. Animals are often chosen for their temperament, tolerance, and energy level consistent with the health care environment and the focus of the team. The purposes and goals of the program are critical in choosing the animal. Although the risks associated with human–animal interactions are minimal, awareness of these potential problems (e.g., zoonoses [i.e., diseases transmitted from animal to human], allergies, and bites) is important when planning to use an animal in a health care environment.

Program Types

Diverse and overlapping terms are used to describe animal-assisted health care programs, such as pet therapy, animal-assisted therapy (AAT), and service animals. Although these terms are often used interchangeably, each type is distinct and characterized by different goals. Pet therapy consists of volunteers bringing animals into health care settings. Pet therapy is also called pet visitation or animal-assisted activities. Typically, the animals are not trained and institutional policies and local health care regulations govern the rules of visitation. Nurses have been active in advocating and instituting pet-visitation programs across health care settings, including the homebound elderly. The Eden Alternative (www.edenalt.com) is a nationally recognized model developed to use live-in pets in nursing-home environments as part of an overall goal to improve the quality of life of the residents.

AAT is more structured and goal-directed than pet therapy. Persons (termed handlers) escorting the animals are given training, and animals are screened and certified for health, obedience, sociability, and temperament. Each AAT team has specific goals, and animals are chosen for their ability to assist in accomplishing the psychosocial or physical therapeutic goals for a client. Specific goals might include increasing rapport between a psychotherapist and a client and maximizing mobility and muscle coordination in a physically debilitated client. Visits are structured and therapeutic outcomes for the client are monitored. Often, the AAT human partner is a health care professional.

Service animals are highly trained and legally defined assistance animals. The Americans with Disabilities Act of 1990 (ADA), a federal civil rights law, defines a service animal as any animal individually trained to do work or perform tasks for the benefit of a person with a disability. The law defines a disabled person as an individual whose physical or mental impairment substantially limits one or more major life activities. The tasks that service dogs are able to perform include guiding persons with impaired vision, alerting persons with hearing impairments to various sounds, pulling wheelchairs, pulling a person into a lying or sitting position, turning switches on or off, retrieving objects, and summoning help. Certain dogs have even been found to be able to detect an impending seizure and alert the victim before the seizure occurs.

Federal laws protect the rights of disabled individuals to be accompanied by their service animals into public places. These animals are closely partnered with their owners, who rely on them to provide vital services. Laws do not restrict the type of service the animals perform, and owners are not required to disclose their disability. Service animals usually wear an identifying harness or vest, but this is not required by law. The rules for interacting with human–animal teams vary when dealing with pet visitation, AAT teams, and service-animal teams.

Care Guidelines

Guidelines are available that govern all types of animal-assisted health care programs. Health care facilities are required to adhere to state or federal guidelines regarding the use of animals. Animals require health screening and immunizations by a veterinarian prior to entering a health care facility. For animals that live in a facility, there are regulations outlining the care of the animal. Pet visitation and AAT programs follow the institutional guidelines for dealing with persons who may be allergic or phobic. Staff and residents should be notified in advance of animal visits, or visits may be restricted to discrete areas of the health facility. Those who are phobic or allergic or do not wish to participate can then remove themselves from the vicinity. Caution should be exercised when animals are exposed to clients who have disabilities that may cause them to handle the animal roughly or provoke the animal unexpectedly.

Institutional and other regulatory systems (local or state) also regulate infection controls. Handwashing, before and after, is standard when there is contact with an animal. Persons with open wounds or active infectious processes are typically excluded from such programs. Pet visitation and AAT programs have recorded thousands of visits without any substantial risk of zoonoses being substantiated in the literature.

Strangers, including health care professionals, should always speak to the person before interacting with the animal partner and should not grab the elbow of visually disabled persons or assist without permission. Such actions may confuse the dog or prevent it from doing its job. Strangers should not talk to, pet, or feed a service animal because these activities also may distract the animal from its work. It is often necessary to explain to others who complain about an animal's presence that the animal is medically necessary and that federal law protects the right of the person to be accompanied in public places. If a service animal/dog barks or growls, it may be necessary to find out what happened (e.g., the dog may have been stepped on). The owner of the service animal/dog may be asked to have the dog lie down, as long as this does not interfere with the animal's work. Federal law allows for animals acting in a vicious or destructive manner to be excluded from a public setting.

The needs of the animal (e.g., adequate water, toileting, and exercise) must be scheduled. Noise, sanitation, staff concerns about the appropriateness of service animals, and cost issues all must be considered before instituting animal-assistance programs in a health care setting. Costs for the animals vary widely. Pet therapy and AAT team animals are often owned by the handler. Service dogs are the most costly because of their extensive training, and public funds do not typically reimburse these costs. Service animals are often provided at a nominal fee to disabled individuals by nonprofit animal organizations, but waiting lists can be as long as 2 years. Many organizations provide information, training, publications, and videos. The Delta Society (www.deltasociety.com) is an international organization for promoting the human–animal bond. It serves as a valuable resource for information about the various types of animal programs.

The use of animals to assist with the care of older adults offers numerous opportunities. Benefits include well-described improvements in psychological well-being and social acceptance, as well as decreased need for paid and unpaid assistance. Animals may be utilized purely as companions for social support, and their usefulness extends from home assistance to facilitation of community activities. The use of service animals across health settings is an increasingly important development and continues to reveal the many positive uses of the human–animal bond.

MARY SHELKEY

See also
Dementia: Special Care Units

Internet Resources
Delta Society
http://www.deltasociety.com

Eden Alternative
http://www.edenalt.com

REFERENCES

Brenner, Z. R., & Krenzer, M. E. (2003). Using complementary and alternative therapies to promote comfort at the end of life. *Critical Care Nursing Clinics of North America*, *15*(3), 355–362.

Camp, M. M. (2001). The use of service dogs as an adaptive strategy: A qualitative study. *American Journal of Occupational Therapy*, *55*(5), 508–517.

Colombo, G., Dello Buono, M., Smania, K., Raviola, R., & De Leo, D. (2006). Pet therapy and institutionalized elderly: A study of 144 cognitively unimpaired subjects. *Archives of Gerontology and Geriatrics*, *42*(2), 207–216.

Kovacs, Z., Kis, R., Rozca, S., & Rozca, L. (2004). Animal-assisted therapy for middle-aged schizophrenic patients living in a social institution: A pilot study. *Clinical Rehabilitation*, *18*(5), 483–486.

Martin, F., & Farnum, J. (2002). Animal-assisted therapy for children with pervasive developmental disorders. *Western Journal of Nursing Research*, *24*(6), 657–670.

Richeson, N. E. (2003). Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia. *American Journal of Alzheimer's Disease and Other Dementias*, *18*(6), 353–358.

Sobo, E. J., Eng, B., & Kassity-Krich, N. (2006). Canine visitation (PET) therapy: Pilot data on decreases in child pain perception. *Journal of Holistic Nursing*, *24*(1), 51–77.

Virues-Ortega, J., & Buela-Casal, G. (2006). Psychophysiological effects of human–animal interaction: Theoretical issues and long-term interaction effects. *Journal of Nervous and Mental Disease*, *194*(1), 52–57.

ANXIETY AND PANIC DISORDERS

Comprehensive care for the elderly includes attention to mental as well as physical health. Approximately 1 in 10 older adults meets criteria for an anxiety disorder (Beekman et al., 1998) that can result in significant psychological distress, increased health care utilization, and decreased quality of life (de Beurs et al., 1999; Diefenbach, Robison, Tolin, & Blank, 2004).

Diagnostic Criteria

Late-life phobias and generalized anxiety disorder (GAD) are most common in elders; obsessive-compulsive disorder, post-traumatic stress disorder, and panic disorder (PD) are less frequent. Subsyndromal anxiety symptoms also are common and disabling (de Beurs et al., 1999). Thus, anxiety symptoms should be considered within treatment planning even when full diagnostic criteria are not met. Diagnostic criteria of phobias, GAD, and PD are described briefly herein (American Psychiatric Association, 1994).

Phobia is diagnosed when an individual develops excessive and unrealistic fear of a circumscribed object or situation. Phobia often leads to subsequent avoidance. Specific phobias can be related to any number of things, such as animals, heights, or air travel. Social phobia is characterized by anxiety in social situations, usually stemming from fear of embarrassment, criticism, or humiliation.

GAD is defined by excessive and uncontrollable worry accompanied by three or more hyperarousal symptoms, including sleep disturbance, irritability, muscle tension, fatigue, restlessness, and difficulty concentrating.

PD is characterized by unexpected panic attacks, which are sudden and intense fear reactions accompanied by physical symptoms such as increased heart rate, perspiration, hyperventilation, chest pain, dizziness, fear of losing control, and fear of dying. Many people who develop PD avoid going out or activities because of fear of triggering a panic attack. When avoidance behavior is significant, agoraphobia is also diagnosed.

Differential Diagnosis

Differentiating pathological from nonpathological anxiety among older adults can be challenging because events that occur during the natural life course (e.g., increased risk of physical illness or injury, loss of income after retirement) are associated with normal stress reactions. Accurate diagnosis of an anxiety disorder requires evaluation of the patient's concerns within his or her environmental context. If the fears and worries are unrealistic, excessive, and/or uncontrollable and cause disruption in functioning (e.g., interpersonal conflict or decreased self-care), an anxiety disorder may be present.

Symptoms of anxiety must be distinguished from physical changes that commonly occur with aging (e.g., problems concentrating, sleep disruption) or are the result of medical disorders (e.g., heart attacks, hyperthyroidism) or medication side effects. Differential diagnosis requires a thorough history and diagnostic interview, as well as medical tests to rule out biological causes. Medical illnesses can also precipitate or exacerbate an anxiety disorder in older adults. For example, PD may develop following a significant illness such as a heart attack.

Recognition of anxiety in those with other psychiatric conditions is also critical. For example, anxiety in older adults with cognitive impairment may be confused with dementia-associated agitation. Determining whether a patient is anxious, depressed, or both can be particularly challenging. It is common for these conditions to co-occur, and "anxious depression" may present as a more severe condition with higher treatment resistance (Diefenbach & Goethe, 2006).

Caring for Older Adults With Anxiety

Both pharmacotherapy and psychosocial treatments can play a role in treatment of anxiety. An individual treatment plan must take into account the patient's living situation (e.g., independent versus assisted living), financial resources, medical status, physical mobility, and cognitive capacity. In addition, clinicians must be familiar with the community resources available when a referral is indicated.

Pharmacotherapy

Primary care physicians often prescribe medication—usually benzodiazepines—for older adults experiencing anxiety. Lower doses of compounds with short half-lives should be prescribed for as brief a duration as possible. Adverse effects of these medications that may be particularly problematic for older adults (e.g., sedation, respiratory depression) and need to be monitored closely. Although buspirone, beta blockers, and antidepressants are alternatives to reduce tension and have less serious side effects, data are lacking about the most efficacious pharmacotherapy for older adults with anxiety.

Psychosocial Treatments

Cognitive-behavioral therapy (CBT) has received empirical support (Wetherell, Lenze, & Stanley, 2005), although the most effective treatment depends in part on the presenting complaint. Systematic desensitization is appropriate for treatment of a specific phobia, whereas exposure with response prevention is the treatment of choice for obsessive-compulsive disorder. CBT approaches for GAD incorporate techniques such as cognitive restructuring, relaxation training, problem-solving, decreasing "worry behaviors" (e.g., checking, reassurance seeking), and sleep management. Treatments for PD may include cognitive restructuring, relaxation training, and exposure to avoided situations and feared physiological sensations. Modifications in CBT programs utilizing exposure techniques may be necessary for medically compromised older adults, and consultations with the patient's medical providers are advised in such cases.

Treatment Adjuncts

In addition to the general therapeutic techniques, education of both the patient and supportive others (e.g., caregivers) is important because older adults tend to be negatively biased about mental health issues. Clinicians can also increase compliance by taking extra steps to facilitate the patient's ability to attend appointments. For example, it may be helpful to provide detailed maps in large print, to offer appointments during low-flow traffic hours, or to assist in using public transportation services. Finally, use of visual and written aids can facilitate learning through multisensory pathways, and use of memory aids may enhance treatment outcome (Mohlman et al., 2003).

GRETCHEN DIEFENBACH

See also

Psychiatric Diagnosis and the *DSM-IV-TR*

Internet Resources

American Geriatrics Society Foundation for Health in Aging http://www.healthinaging.org/agingintheknow/chapters_ch_trial.asp?ch=33

Anxiety Disorders Association of America
http://www.adaa.org/GettingHelp/FocusOn/Elderly.asp

National Institute of Mental Health
http://www.nimh.nih.gov/publicat/anxiety.cfm

REFERENCES

American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.). Washington, DC.

Beekman, A. T. F., Bremmer, M. A., Deeg, D. J. H., van Balkom, A. J. L. M., Smit, J. H., de Beurs, E., van Dyck, R., & van Tilburg, W. (1998). Anxiety disorders in later life: A report from the longitudinal aging study, Amsterdam. *International Journal of Geriatric Psychiatry*, *13*, 717–726.

de Beurs, E., Beekman, A. T. F., van Balkom, A. J. L. M., Deeg, D. J. H., van Dyck, R., & van Tilburg, W. (1999). Consequences of anxiety in older person: Its effect on disability, well-being, and use of health services. *Psychological Medicine*, *29*, 583–593.

Diefenbach, G. J., & Goethe, J. (2006). Clinical interventions for late-life anxious depression. *Clinical Interventions in Aging*, *1*, 41–50.

Diefenbach, G. J., Robison, J. T., Tolin, D. F., & Blank, K. (2004). Late-life anxiety disorders among Puerto Rican primary care patients: Impact on well-being, functioning, and service utilization. *Journal of Anxiety Disorders*, *18*, 841–858.

Mohlman J., Gorenstein, E. E., Kleber, M. S., de Jesus, M., Gorman, J. M., & Papp, L. A. (2003). Standard and enhanced cognitive-behavior therapy for late-life generalized anxiety disorder: Two pilot investigations. *American Journal of Geriatric Psychiatry*, *1*, 24–32.

Wetherell, J. L., Lenze, E. J., & Stanley, M. A. (2005). Evidence-based treatment of geriatric anxiety disorders. *Psychiatric Clinics of North America*, *28*, 871–896.

ARTHRITIS

See
Osteoarthritis
Rheumatoid Arthritis

ASIAN AMERICAN AND PACIFIC ISLANDER ELDERS

In the United States, Asian Americans and Pacific Islanders (AAPI) are a diverse population who immigrated, or whose ancestors immigrated, from various countries in Asia and the Pacific Islands. As many as 29 distinct nationalities are enumerated by the U.S. Bureau of the Census, although actual ethnic, cultural, and language groups number in the thousands. The larger Asian American groups include Chinese, Filipinos, Koreans, Japanese, Vietnamese, Asian Indians, Cambodians, Laotians, H'mong, and Thai. The larger Pacific Islander groups include Native Hawaiians, Samoans, Guamanians, and Tongans. The life experiences of AAPI are affected by economic, political, and social policies in areas of the government as diverse as justice, defense, labor, education, and foreign relations. As with all populations, their life experiences have an impact on access to and participation in health and social service programs.

Historic Context

Each AAPI ethnic community in the United States has a rich and varied history linked to the wave or cohort in which community members arrived. Initial waves of Chinese immigrants were bound by historic policies and practices of segregation to specific streets in San Francisco; mining claims in California, Wyoming, and Nevada; low-paid, high-risk jobs building the transcontinental railroad; and later, restaurant, laundry, and other service-sector jobs that were not competitive with other races. Initial waves of Japanese, Filipinos, and Koreans were allowed limited social and economic roles as farm workers, domestic or food service workers, and day laborers. More recently, relatively large numbers of older adult Chinese, Filipinos, Koreans, Asian Indians, Tongans, and others have arrived as U.S. laws supported family reunification. At the same time, other U.S. foreign policies supported the immigration of Vietnamese, Cambodians, H'mong, Laotians, and Chinese seeking refuge from political unrest and the effects of war.

In the past 40 years, life for many AAPI and other elders of color in the United States has been affected by major social, economic, and political change: reparations paid to Japanese Americans in recognition of their unfair incarceration during World War II; statutory laws permitting AAPIs to own property and businesses; affirmative efforts to permit all persons fair access to housing and public accommodations; and drivers' tests, election ballots, and health information in languages other than English. In some instances, relations within ethnic groups of AAPI have undergone as much change as those between each AAPI ethnic group and "Americans."

Demographics

The 2000 census shows that AAPI elders continue to be among the fastest growing ethnic population among older adults, representing 900,000, or 3%, of 34 million older adults in the United States. They numbered about a half million in 1990, and this number is expected to more than double by 2010. AAPI older adults are more likely to be foreign-born (i.e., 70% compared with 9% for non-AAPI elders) and more likely to speak a language other than English at home (i.e., 80% for AAPI, compared with 12% for non-AAPI). Yet, more than half of foreign-born AAPI elders are naturalized U.S. citizens compared to a third for other groups (Barnes & Bennett, 2002; Reeves & Bennett, 2003). Nativity, language, and citizenship differences among AAPI elders are the types of indicators that could help service providers better understand their AAPI clients. Among Japanese, Chinese, and Cambodians, for example, differences are pronounced and are further affected by the length of time individuals have been in the United States (e.g., arrival as children or young adults and participation in the U.S. educational system).

Program Participation

In community capacity-building assessment meetings between 1997 and 1999, elders stated that they were uninformed about, ignored by, and at times unwelcome at mainstream programs for older adults in their communities (Yee, Sanchez, & Shin, 1999). Although many AAPI elders (especially in Western states) have resided in the same place for decades, paid taxes, and participated in the economic growth of their communities, they are often not visible and do not participate in social and health service programs in their communities, even though data lead us to expect that they would need such help.

Nearly all AAPI elders live in urban and suburban areas; by 2000, more than half lived in California, New York, and Hawaii. Other states where at least 4.2% of the population is AAPI include Washington, Nevada, and Alaska in the West; and New Jersey, Maryland, and Virginia in the East. Yet, the few microdata sources on AAPIs overall or on any specific AAPI ethnic group in the United States persist. Considered too small a population to include in analyses of national survey data, AAPI elders are also less likely to participate in national mailed or telephone surveys that are only in English: many AAPI elders have also learned from life experience that talking about problems or personal situations to "government" representatives can result in oppressive and retaliatory actions, such as having benefits curtailed or denied or having family members investigated. Efforts by service providers to understand and respond to the needs of AAPI elders are often problematic and are unsuccessful in establishing rapport, identifying possible interventions that meet stated needs, and achieving successful referrals to available service programs.

Challenges for Service Providers

Recent work consistently indicates that service providers and AAPI elder communities must jointly take steps to address critical needs and improve the quality of life for AAPI older persons. Community-wide outreach programs and service delivery for infants and young children, AIDS- or HIV-infected individuals, the unemployed, and frail older adults since the late 1970s have met with mixed results and have been largely ineffective and unsuccessful.

Several voluntary community-based organizations that serve specific AAPI ethnic groups have had long-term success in service delivery in their geographic areas. At the same time, many public health and social service programs appear to have abandoned efforts to systematically reach and appropriately serve AAPI elders. Increasing complexity within service systems, scarcity of resources, and a lack of direction to effectively serve newer, smaller, harder-to-reach communities are among the reasons given for the lack of effort and success in serving AAPI elders. Gathering in forums that promote community capacity-building by eliciting community issues, listening to elders' perspectives, and enjoining problem solvers to sustain dialogue until new solutions are developed can be an effective intervention (Yee, Sanchez, & Shin, 1999).

Addressing language and information barriers is a first step toward increasing understanding among AAPI elders and indicating that service systems want to be responsive to the social, health, and other human service needs of AAPI elders. Quick fixes, such as the use of "black box" communications (i.e., piping the ATT Language Service into medical examination rooms and government offices), may be better than nothing in some cases but could be more harmful in other situations. Anyone who has been frustrated while trying to decipher literally translated instructions (from Japanese or German into English) to assemble furniture or to operate electronic equipment can understand why literal translations from English into an AAPI language cannot be assumed to work for AAPI older persons. Cultural translation is also needed to ensure communication and rapport between doctor and patient, provider and consumer, and outsider and family. Literal interpretation might not be enough to facilitate the breadth and depth of communication needed when exchanges are about complex issues.

Health care access issues are a critical problem. Elders need explanations of how service programs and service systems work in ways that make sense to them. Concepts such as prepaid health care or home- and community-based care are not likely to be part of an AAPI elder's vocabulary or life experience. Practitioners must be willing to recognize differences in cultural assumptions about private and public roles. Understanding family roles in decision making among many AAPI may mean asking about and being open to ways in which an eldest son, a husband, or a brother-in-law can make decisions rather than the elder patient herself. An AAPI family may need help understanding that "Americans" place importance on end-of-life or insurance issues and that such decisions are usually made by the individual client. Concurrently, service providers may need to recognize that a patient or client has different priorities. A mutual understanding of differences and a mutual willingness to communicate in the context of such differences are more likely to lead to a negotiated resolution.

Best Practices and Lessons Learned

Anne Fadiman's (1997) account of harrowing mismatches between the "American" health system and a H'mong family and Sawako Ariyoshi's (1984) novel of a woman's relationship with her frail inlaws in postwar Japan are two excellent portrayals of how help-seeking behavior, problem identification, and problem solving between client and service provider are only the first steps in providing appropriate and good care in cross-cultural situations. Attending to the cross-cultural aspects of each mini-episode of the caregiving relationship is critical to identify appropriate interventions that address the initial problem (Yee, 1999).

Contact between those whose mission it is to provide services and meet needs and those who need assistance is critical in building relationships. Communication with one another about shared and differing cultural assumptions can build a bridge of cultural competence and make significant differences in the quality of life and health outcomes for AAPI elders.

Donna L. Yee

See also

Cultural Assessment

Cultural Competence and Aging

Internet Resources

American Society on Aging/Multicultural Aging Network
http://www.asaging.org

National Asian Pacific Center on Aging
http://www.napca.org

The National Women's Health Information Center, Office on Women's Health in the U.S. Department of Health and Human Services
http://www.4woman.gov/faq/Asian_Pacific.htm#1

Office of Minority Health
http://www.omh.gov

REFERENCES

Ariyoshi, S. (1984). *The twilight years*. Japan: Kodansha America.

Barnes, J. S., & Bennett, C. E.. (2002). *The Asian population: 2000*. Washington, DC,: U.S. Census Bureau, p. 10.

Fadiman, A. (1997). *The spirit catches you and you fall down*. New York: Noonday Press.

Reeves, T., & Bennett, C. E. (2003). *The Asian and Pacific Islander population in the United States: March 2002*. Washington, DC: U.S. Census Bureau, p. 8.

Yee, D. L., Sanchez, Y. N., & Shin, A. (1999). *Establishing information infrastructure for API elders: A roadmap for assuring rights and protections of HCFA beneficiaries (final recommendations on the vulnerable populations project).* Seattle, WA: National Asian Pacific Center on Aging.

Yee, D. L. (1999). Preventing chronic illness & disability: Asian Americans. In M. L. Wykle and A. B. Ford (Eds.), *Serving minority elders in the 21st century* (pp. 37–50). New York: Springer Publishing.

ASPIRATION

See
Swallowing Disorders and Aspiration

ASSISTED LIVING

Assisted living (AL) is a social-medical model of residential housing that provides or coordinates personal services, 24-hour supervision and assistance (scheduled and unscheduled), recreational activities, and health-related services for six or more people. Known by several names—residential care, home for the aged, housing with services, board and care, personal care, enriched housing—the distinctions lie in state regulations, certification, or licensing; type of housing unit (e.g., shared room or apartment); and the needs that can be met. In contrast, state-licensed adult foster or family care is for four to six people residing in the provider's home. Statistics suggest that "light-care" residents who would have been in nursing homes are opting for AL residence. Approximately 1 million people live in 20,000 to 30,000 AL residences (ALRs) in the United States, a range that reflects the variable state definitions of AL. Although some federal laws apply, AL is regulated and monitored by the state. The number, nature, and scope of AL regulations continue to increase particularly as AL residents are frailer, sicker, and older than when AL first appeared as a residential-care option. Specifically, states are concerned about resident retention, quality of care, and staffing (Mollica & Johnson-Lamarche, 2005).

AL is for frail elderly people and adults with disabilities who need assistance to live independently or who cannot live alone but do not require 24-hour skilled nursing care or medical monitoring. A vexing problem for states as well as providers is the balance between resident autonomy (and risk taking) and safety needs. In about one-third of states, residents (or their family or surrogate) can sign a "negotiated risk" contract that allows them to remain in the ALR despite functional and/or cognitive decline. Also known as "managed risk" or "shared responsibility," potential consequences of the resident's actions must be described as well as options to limit risk and honor the resident's wishes. The agreement process and areas of disagreement must be documented. Some states (e.g., Oregon) do not permit a risk agreement if the resident is unable to comprehend the consequences associated with actions.

The consumer-centered philosophy of AL promotes wellness and maximizes quality of life, independence, privacy, choice, safety, decision making, and "aging in place" in a homelike environment.

Private living units, including private bath (85% of ALRs), are a critical feature of AL; residents may lock their doors. At least 30 states allow two people to share a unit (i.e., apartment) or bedroom but, in some states, only if the two parties choose to do so (e.g., Washington). Depending on the licensing category, some states allow as many as four people to share a unit. Regulations in 21 states contain a statement of AL philosophy, in greater or lesser detail (e.g., aging in place), as well as describe services that may or may not be offered. Given the likelihood of increasing needs and frailty and the ALRs obligation to provide appropriate care, many ALRs feel they will evolve into a kind of "nursing home lite" environment—something they did not intend philosophically, operationally, or fiscally. Although state regulations set boundaries for the scope of services, providers (i.e., operators) nevertheless have considerable latitude in deciding what will be offered and which residents (i.e., tenants) will be admitted, retained, or discharged.

An occupancy, service, "contract," or "residency" agreement, executed before or immediately on admission to an ALR, is based on an assessment of the person's need for services and how they can best be met. Virtually all states require that ALRs disclose the services that will be provided to meet reasonable care needs. About half the states require disclosure of costs and services beyond the basic rate, discharge criteria, grievance processes, resident rights, and retention and relocation criteria in case the ALR is unable to meet the resident's health and safety needs. In some states, ALRs must disclose their staffing pattern and staff training. Forty-four states have special regulations for ALRs that claim they provide dementia care including specific disclosure regarding services provided, programming, staff training, the environment, and security provisions.

States can have a single level of AL or a two- or three-level model stipulating the services that can be provided or needs that can be met. It is illegal for an ALR to refuse to admit an individual whose health care needs can be met in the ALR as stipulated in the state's regulation and as protected by the Americans with Disabilities Act (ADA). The most compelling reason for discharge, permitted by 39 states, is that the ALR cannot provide the services needed or care needs exceed what the ALR license permits. Hence, the nature, frequency, duration, and intensity of health-related and nursing care permitted by regulation will determine the feasibility of aging in place. A resident can be at risk of discharge for reasons unrelated to licensure but rather for financial reasons; that is, inability to privately purchase the additional care and services needed from a home health agency. The worst-case scenario is a resident who remains too long in an ALR where the staff is not trained for complex health care management.

The number and type of staff vary with the number of residents, their needs, and the services provided. Personal-care staff can be employed by the facility or contracted from an outside agency (e.g., licensed home-care agency). Twenty-six states require the ALR to employ or contract with a licensed nurse (i.e., RN or LPN). Only one state, Alabama, requires a physician medical director. Every ALR must have an administrator (i.e., manager, director, or operator) who has overall responsibility for staff performance and resident well-being. Administrators must be specially trained in 72% and specially licensed in 46% of states. At least 65% of ALRs have a registered nurse or licensed practical/vocational nurse on-site a few hours per week or a few hours per day. Some ALRs employ an advanced practice nurse (i.e., geriatric or adult nurse practitioner) to conduct admission assessment, develop a plan of care, and provide health maintenance oversight and medication management.

Forty-two states have specific staffing standards based on resident needs; 18 have minimum staffing ratios. In all ALRs, there must be at least one person available during the night hours. Most states (98%) require that direct-care staff are trained at the time of or prior to employment, but the curriculum varies: resident rights (required in 80% of states); emergency procedures (including CPR), first aid, and fire/safety/disaster preparedness (60%); infection control and abuse/neglect prevention (42%); dementia and behavior management (35%); special needs of resident/elderly (36%); and the aging process (18%). Few states develop the curriculum;

the ALR or a staff-development enterprise can create the content with scant state review for quality. Few states require an examination or trainer standards; training can vary from just a few hours to 25 hours or more; and 84% of states require continuing education.

All ALRs monitor residents' well-being and provide daily supervision and assistance with instrumental and personal activities of daily living (IADLs and ADLs); three meals a day, including therapeutic diets; housekeeping and laundry services; medication management; transportation for recreational and shopping trips; and an emergency call system. Twenty-one states permit nonlicensed staff to administer medications. Residents who are temporarily incapacitated or recuperating from surgery, injury, or illness, or those who are dying, can remain in the AL facility if it can provide the necessary services and care. Each resident's health care is supervised by a physician of her own choosing.

Admission and retention criteria vary widely among states. In the 10 states with broad criteria and flexible rules (e.g., Maine, Oregon, and Minnesota), ALRs are most likely to support aging in place. However, the ALR is not required to retain the resident. Some states simply require that a prospective resident be in stable health and not need 24-hour nursing care; other states' criteria screen out those who are bedbound, incontinent, have deep pressure ulcers, need artificial feeding or hydration, or are ventilator-dependent. States might have criteria relating to independent ambulation, ability to use the toilet unassisted, and stage of dementia. New Jersey ALRs may admit and retain residents who are continuously dependent in four ADLs, have impaired decisional capacity, are bedbound more than 14 days, are medically unstable, a danger to self or others, and require treatment for severe pressure sores. Almost all states require discharge if the resident is no longer independently mobile, a requirement linked to fire safety and ability to evacuate the premises.

Exceptions to a state's discharge criteria, approved by the state, include temporary conditions (associated with remaining in bed for as many as 10 days); the resident's ability to independently perform or direct another in performing a medical procedure (e.g., oxygen administration, tube feeding, sterile dressing, insulin injection); consent by the resident, facility, and physician; state approval on a case-by-case basis; and family assistance with care. Thirty-one states allow home health care or third-party provider assistance for "skilled nursing care" if it is short-term, temporary, or for an acute illness. Home health is permitted in more than two-thirds of states as a component of AL, unrelated to admission or retention. Residents can contract directly with the agency or third-party provider for desired services.

Home care can be provided in ALRs for Medicare beneficiaries who meet eligibility criteria. A registered nurse from a certified home-care agency supervises and monitors the care. Hospice care as a home-care service can also be provided in ALRs. This decision is made by the facility and the resident or family, is not contingent on state regulations, and constitutes an exception from the discharge requirement.

The typical AL resident is female, White, 83 years old, and needs assistance with three ADLs (i.e., bathing, dressing, and medication administration). Slightly less than half of all residents have some cognitive impairment, among whom 25% are severely cognitively impaired. More than 50% of residents need assistance with bathing; almost two-fifths of all residents use wheelchairs for mobility. Although most residents come to AL facilities from their own homes, slightly under 20% come from nursing homes. It is estimated that 13% of AL residents are clinically depressed; yet, only 18% of those individuals are on antidepressant medications (Watson, Garrett, Sloan, Gruber-Baldini, & Zimmerman, 2003). These residents are at increased risk of nursing-home admission and death. Studies indicate that AL residents are taking more medication, in general, than nursing-home residents and receive more psychotropic medications than their nursing-home and community-residing peers. In addition, many of their medications are inappropriate for their age, unrelated to a diagnosis or condition, and poorly monitored. After an average stay of 26 months, approximately 45% of residents are discharged to nursing homes and 26% have died. Approximately 5% of residents leave AL facilities for financial reasons.

The AL market is predominantly private pay; there is no ALR entry fee. Forty-three states pay for some components of AL for Medicaid-eligible ALR residents (estimated at 121,000) under the Medicaid state plan, the Home and Community-based Service (HCBS) waiver (Section1915c), (http://www.cms.hhs.gov/MedicaidStWaivProgDemoPGI/05_HCBSWaivers-Section1915(c).asp) or some combination. Under the waiver (36 states), states can provide home and community services to nursing-home–eligible Medicaid beneficiaries, such as personal care and homemaker services, medication management, home-delivered meals, and staffing for supervision and services. Inasmuch as room and board cannot be covered by the waiver, some states assist Medicaid AL residents by fixing the room and board cost that the ALR can charge the resident, supplementing the resident's Supplemental Security Income (SSI) payment to use for this cost, offering housing subsidies, permitting family contribution to cover room and board costs, and encouraging participation in the federal food stamp program to reduce board costs (Mollica & Johnson-Lamarche, 2005). State Medicaid policy determines the type of unit (i.e., single or shared) for Medicaid beneficiaries in ALRs (Washington permits shared units only by choice). Long-term-care insurance is infrequently used or available among AL residents.

Average monthly fees are about $2,000; this is higher than the typical board and care fee but lower than nursing-home costs. The actual fee paid by the resident depends on the type of housing (i.e., shared versus private room) and the kind and number of services included in the contract. Medicaid reimbursement can be an all-inclusive, flat-rate monthly price; tiered pricing based on the package of services needed (or desired) by the resident; tiered rates based on the resident's acuity level; fee-for-service pricing based on the resident's "a la carte" selection of services; or some combination of these models.

Several states are developing innovative financing mechanisms to assist developers in constructing affordable AL housing. A growing number of nonprofit and for-profit nursing homes are converting beds and wings to AL. Many continuing-care retirement communities offer AL either in the tenant's current domicile or by relocation to an AL facility on the premises. Medicare capitated, managed-care organizations view AL as being well suited for managing rehabilitation and providing a supportive environment for frail managed-care enrollees.

Virtually every state is studying or promulgating regulations and licensure requirements that distinguish AL from other long-term-care and residential models. States have the authority to set provider standards; many have done so with respect to food preparation and fire safety. Standards of care, compliance surveys, and mandatory reporting systems vary among states; there are no uniform requirements (U.S. Government Accounting Office, 2004). Medication management, staffing, qualifications and quality, adequacy of care, and plans of care are the major sources of complaints and deficiencies. Twenty-four states use different surveyors for AL and nursing-home quality-of-care inspections. Federal quality-of-care standards probably will not be promulgated in the near future because it is unlikely that the federal government will become a major AL payer. The state role in monitoring and licensure will continue to grow, especially as Medicaid assumes greater responsibility for the costs of care and services.

A growing body of scholarly research, much of it multidisciplinary, is engaging the AL industry as well as state legislative bodies, advocacy groups, professional associations, and academia. In-depth information is needed about AL users: their expectations and preferences, finances, functionality, conditions and illness trajectories, relocation, and outcomes. Research is needed regarding dementia-care services and outcomes. Comparisons with other kinds of long-term health and social services and settings might help sharpen the focus and future of AL.

ETHEL L. MITTY

See also
Continuing Care Retirement Communities
Nursing Homes

Internet Resources

Assisted Living Federation of America
http://www.alfa.org

Center for Excellence in Assisted Living (CEAL)
http://www.ceal.org

National Center for Assisted Living
http://www.ncal.org

REFERENCES

Carlson, E. (2005). *Critical issues in assisted living: Who's in, who's out, and who's providing the care*. Washington, DC: National Senior Citizens Law Center.

Mollica, R., & Johnson-Lamarche, H. (2005). *State residential care and assisted living policy: 2004*. Washington, DC: Office of Disability, Aging, and Long-Term Care Policy.

U.S. General Accounting Office. (2004). *Assisted living: Examples of state efforts to implement consumer protections*. Washington, DC: U.S. General Accounting Office, GAO-04-684, April 2004.

Watson, L., Garrett, J., Sloan, P. S., Gruber-Baldini, A. L., & Zimmerman, S. (2003). Depression in assisted living: Results from a 4-state study. *American Journal of Geriatric Psychiatry*, *11*; 534–542.

ASSISTED SUICIDE

See
Euthanasia
Physician-Assisted Suicide and Euthanasia

ASSISTIVE TECHNOLOGY

Defined as "technology that helps an individual to carry out a functional activity" (Cook & Hussey, 2002, p. 5), assistive technology encompasses a wide range of devices and services used to help older individuals. With age, certain tasks and daily routines become more difficult and sometimes impossible to complete independently due to changes in vision, hearing, strength, memory, dexterity, and mobility. As these tasks become more challenging, it may be necessary to employ various interventions to reduce the functional limitations that sometimes come along with aging. Assistive technology is the most influential of these interventions.

Assistive Technology Devices

According to the Technical Assistance to the States Act, an assistive device is "any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain or improve functional capabilities of individuals with disabilities" (Technology-Related Assistance for Individuals With Disabilities Act, 1988). There are more than 25,000 of these devices that can be used in all facets of life, including daily care, work, and mobility. Such devices are considered either high tech or low tech. High-tech devices such as powered wheelchairs, electronic communication systems, or computers, are considered more expensive and difficult to obtain or create. Low-tech devices like paper communication boards, simple writing aids, and modified eating utensils are generally inexpensive, simple to make, and easy to obtain. Within the growing industry of assistive technology, such items are getting easier to obtain and can be purchased at general stores, pharmacies, and medical supply stores and through mail-order catalogs (Liebig & Sheets, 1998). Looking around an elderly person's home, it is not uncommon to find assistive devices such as a large-button phone for vision loss or a cane for mobility.

Device Types

Devices that aid an individual with visual impairments include closed-circuit television; talking devices such as a talking calculator, watch, or scale; screen readers for the computer; audio books; tactile markings on important items; a magnifier; items labeled with large print; increased lighting; and use of transparency sheets to change the contrast on printed material (AzTAP). Hearing can also be an issue in the aging population. Devices used for hearing impairments include hearing aids, cochlear implants, vibrating or light-up alarm clocks, flashing smoke detectors, captioned TV, assistive listening devices, and TTY telephones (AzTAP). Speech impairments, temporary and permanent, may require aids such as text-to-speech interfaces, computers with scanning, picture boards, dry-erase boards, paper and pencil, pointing, finger spelling, and signing (Cook & Hussey, 2002). Further, mobility can be greatly affected with age. Mobility aids include both high- and low-tech devices such as wheelchairs, scooters, adapted vehicles, seating and positioning systems, canes, walkers, and hand controls for driving (AZTAP; Cook & Hussey, 2002).

An increasing number of products have been designed to enhance memory function, including such products as the FINDIT Key Finder™ that beeps when a person claps; a keychain recorder that fits on the keychain and records short voice memos; Talking Rx™ that tells the patient how many pills to take, when to take them, and what they are for; handheld computers to record appointment dates and times; voice recorders to record reminders; a pill box, a notepad, and a pencil that are kept in a pocket; a chain that attaches keys to the body; and post-it™ notes placed around the home as reminders of when to do certain activities (AzTAP).

Activities of daily living (ADL) such as feeding, dressing, and self-care may also become challenging as a person ages due to decreased strength, mobility, and dexterity. Aids for dressing include a reacher, a long-handled shoe horn, a sock aid, zipper pulls, trouser pulls, and button hooks. For food preparation and eating, an elderly person may use a suction-cup plate, bowl, and pan holders; enlarged rims on plates for easier scooping; removable plate rims; capped cups; nose cutouts for cups; and built-up handles for utensils. Self-care assistive devices include tub benches, grab bars, bath lifts, nonslip bathmats, walk-in shower units, handheld shower sprays, long-handled sponges, sponge holders, curved handle brushes, built-up or modified brush handles, universal cuffs for brushing teeth or hair and shaving, lever-handled faucets, and a raised toilet seat (Cook & Hussey, 2002).

Older adults may also have a difficult time manipulating their environment easily. There are a few aids that can be of assistance in these instances. Environmental control units operate a variety of home electronics, from telephones and lights to appliances and window coverings. In addition, robotic systems are increasingly being used. For example, mounting a robotic system on a desktop can help control the working environment, or one can be installed on a track system to manipulate throughout the entire home, as well as to assist in feeding, self-care, and object movement (Cook & Hussey, 2002).

Many assistive-technology devices and home modifications may be used to increase the safety of individuals in their homes. Some examples include installing flashing smoke detectors, adding ramps, widening doorways, using a tub bench and grab bars, removing loose rugs, increasing lighting in dark hallways, eliminating the constant use of stairs, and adding levered or gripped door handles for easy exit in case of emergency (AzTAP).

Assistive Technology Services

The Technical Assistance to the States Act defines assistive technology service as "any service that directly assists an individual with a disability in the selection, acquisition or use of an assistive technology device" (Cook & Hussey, 2002, p. 5). This includes evaluating an individual's needs and skills for assistive technology; selecting, designing, repairing, and fabricating assistive-technology systems; coordinating therapy services; and training both individuals using the device and their caregivers in its proper use (Cook & Hussey, 2002).

Included in assistive-technology services is the evaluation of a client's needs and skills for the use of assistive technologies. The individual must first be referred for assistive technology, which can be done by the consumer, caregiver, rehabilitation professional, or a physician (Cook & Hussey, 2002). This requires an established need for assistive technology. Once the individual is referred, the service provider gathers information regarding his or her background and perceived need for assistive technology. An evaluation of the individual follows, which entails the service provider completing a needs-identification evaluation. This is a key aspect of the evaluation because it guides how the remainder of the evaluation is completed. Components included in the needs identification are the client's life roles, activities, difficult tasks to perform, contexts, and prior technology history. The service provider then completes an evaluation to determine the skills of the individual in terms of his or her sensory, physical, cognitive, and language systems.

Once the evaluation has been completed, the service provider makes recommendations and helps the individual make good decisions regarding assistive technology by providing information about the cost, funding available, and use of the item. If assistive technology is needed, the service provider orders, delivers, and installs it, if necessary. Training is then provided to help the individual use the assistive device independently and safely in his or her own environment (Cook & Hussey, 2002).

Many different professionals, including but not limited to an occupational therapist, a physical therapist, or a speech therapist can be a service provider.. These professionals often work as a team in evaluating and treating clients and thus work together to implement assistive technology. Specifically, "occupational therapists with assistive technology experience and education are qualified to evaluate for and provide assistive technology" (American Occupational Therapy Association, 2004, p. 678). The same is true for a variety of other professionals, and this experience and education can occur on a professional as well as an individual level.

Funding

Funding for assistive technology depends on the state in which one lives. For individuals 65 years old and older, the primary source of funding is Medicare. Medicare is federally administered; however, each state also has its own rules governing the use of its funds. Medicare covers durable medical equipment and supplies, which include wheelchairs, grab bars, hospital beds, lifts, walkers, and prosthetic devices (Cook & Hussey, 2002; AzTAP). Federal and local grants provide additional funding. The Veterans Health Administration is another source of funding for former service men and women who have a disability. The Veterans Health Administration funds driving and transportation aids, medical equipment, wheelchairs, hearing aids, prosthetics, speech aids, and assessment services, among others (AzTAP). However, although there is a variety of funding sources for assistive technology available, most often the primary payer is the consumer.

Public Policy

The Assistive Technology Act of 1998, which replaced the Technology-Related Assistance for Individuals with Disabilities Act of 1988, addresses the expansion of assistive-technology devices and services and "mandates consumer-driven assistive technology services, capacity building, advocacy activities, and statewide system change" (Cook & Hussey, 2002, p. 11). This act also supports grants for the expansion and administration of alternative financing for assistive-technology systems (Cook & Hussey, 2002). Other public laws include the Americans with Disabilities Act of 1990 (ADA) requiring county and state governments to make facilities and services available to persons with disabilities, and the Rehabilitation Act of 1973 stating that "no person with a disability shall be excluded from participation, denied benefits, or otherwise discriminated against" (Cook & Hussey, 2002).

Federal policy is an ongoing issue because although its purpose is to assure accessibility and funding for all of those with disabilities, this does not always occur. This in turn leaves individuals with disabilities not only paying for their technology but also struggling to function in the community.

JAMIE M. SEITZ
NORALYN DAVEL PICKENS

See also

Environmental Modifications: Home; Institutional
Rehabilitation
Technology

Internet Resources

American Association of Retired Persons
http://www.aarp.org

ABLEDATA
http://www.abledata.com

American Occupational Therapy Association
http://www.aota.org

ElderWeb – Eldercare Directory
http://www.elderweb.com

Independent Living Institute
http://www.independentliving.org

Rehabilitation Engineering & Assistive Technology Society of North America
http://www.resna.org/

REFERENCES

American Occupational Therapy Association (2004). Assistive technology within occupational therapy practice. *American Journal of Occupational Therapy*, *58*, 678–679.

Arizona Technology Access Program (AzTAP) (n.d.). *AzTAP's new initiative on aging: Assistive technology and aging in place. Available at* http://www.nau.edu/ihd/aztap/aztap_geriatric/index.shtml

Cook, A. M., & Hussey, S. M. (2002). *Assistive technologies: Principles and practice* (2nd ed.). St. Louis: Mosby, Inc.

Liebig, P. S., & Sheets, D. (1998). State assistive technology policies and programs for older adults with disabilities: Trends and innovations. *Technology and Disability*, *10*, 151–159.

Technology-Related Assistance for Individuals With Disabilities Act, *Pub. L. 100-407*, *29*. §2002 (1998).

ASSOCIATION FOR GERONTOLOGY IN HIGHER EDUCATION

The Association for Gerontology in Higher Education (AGHE), an educational unit of the Gerontological Society of America, was established in 1974 as a membership organization of colleges and universities that provides research, education, training, and service programs in the field of aging. Its basic goal is to provide an organizational network to assist faculty and administrators in developing and improving the quality of gerontology and geriatric programs in institutions of higher education. The current membership of AGHE consists of more than 300 institutions throughout the United States, Canada, and abroad.

The purpose of AGHE is to foster the commitment of higher education to the field of aging through education, research, and public service. AGHE offers an annual meeting, the AGHExchange newsletter, the National Directory of Educational Programs in Gerontology, the National Database on Gerontology in Higher Education, technical assistance in the development and expansion of academic gerontology programs, research on gerontology education and manpower needs for the field of aging, and the advocacy of public and private support for aging education and research.

EDITORIAL STAFF

Internet Resource

Association for Gerontology in Higher Education
http://www.aghe.org

ATROPHIC VAGINITIS

Atrophic vaginitis refers to the constellation of symptoms that can result from loss of estrogen to the vagina. Although it can occur in any hypoestrogenic state, atrophic vaginitis is most often associated with menopause. Unlike the vasomotor symptoms of menopause, which tend to abate with time, the symptoms of vaginal atrophy tend to worsen with time and, in fact, may not become bothersome until several years or more after the last menses, particularly in women who are not sexually active. Overall, it is reported that symptoms related to vaginal atrophy occur in up to 50% of women.

After menopause, the lack of endogenous estrogen drastically alters the tissues of the vagina and vulva (ACOG Task Force, 2004). There is a loss of adipose tissue and collagen, resulting in thinning of the labia majora, attenuation of the labia majora, and atrophy of the clitoral prepuce. The introitus shrinks; there is a loss of rugae in the vagina and thinning of the vaginal mucosa. The vaginal canal shortens, narrows, and decreases in elasticity. Healing adhesions may develop if the tissues tear. Sebaceous-gland secretion declines, resulting in decreasing vaginal lubrication with sexual stimulation. The lactobacilli species that colonize the normal vagina decrease in number, and vaginal pH rises, a condition that encourages overgrowth of pathogenic bacteria and infection. This, along with accompanying changes in the bladder mucosa, may lead to an increasing frequency of cystitis. Symptoms of vaginal atrophy include vaginal dryness, pain with intercourse, postcoital bleeding, itching, discharge, and burning. Anticipation of discomfort can interfere with sexual arousal and cause patients to avoid sexual activity, ultimately presenting as lack of libido.

Physical Examination

A complete pelvic examination, including a bimanual exam and Pap smear, should be provided to postmenopausal patients. Clinicians should use a narrow speculum, which may be lubricated for comfortable insertion if a Pap smear is not planned. The bimanual exam may be performed gently with just one finger, and a second finger in the rectum will usually allow for an adequate evaluation of the pelvic organs.

Physical findings in the patient with atrophic vaginitis vary depending on how long the condition has been present, whether there is sexual activity, and whether there are other co-morbidities. In early menopause, the vagina may appear normal, with decreased lubrication and mild dypareunia the only symptoms. In long-standing atrophy, the labia majora become thin and small, and there is loss of the standard architecture delineating the labia minora and majora. The mucosa of the vagina becomes smooth, thin, and fragile, often bleeding upon speculum insertion, and an abnormal discharge may be present. Petechiae may be present and fissuring can occur at the fourchette. The introitus becomes narrow and the vagina foreshortened if sexual activity is infrequent. The vaginal pH is elevated at or above 4.0. If labial redness, whitening, or fissuring is present, concomitant yeast infection or lichen sclerosis may be present.

Microscopic examination of vaginal secretions using wet mount and KOH prep helps confirm the diagnosis of atrophic vaginitis and rules out coexisting conditions. Because office wet mount is only 50% sensitive in diagnosing yeast, a vaginal fungal culture should be sent if yeast infection is suspected but not found on KOH prep, if findings on wet prep are not diagnostic of atrophic vaginitis in the menopausal patient with dyspareunia, or if the patient with atrophic vaginitis fails to respond to usual treatment.

In diagnosing atrophic vaginitis, the clinician must be sure to rule out infections of other causes, including sexually transmitted infections (Bachmann & Nevadunsky, 2000). Yeast infections often present in menopause with dryness and painful intercourse (dyspareunia) as the only symptoms and without the classic findings of “cottage cheese” discharge, labial edema, and pruritis. Other conditions, such as lichen sclerosis or lichen planus, may accompany atrophic vaginitis and contribute to symptoms. Women who fail to respond to standard therapies for atrophic vaginitis should be evaluated to rule out or treat these entities.

Treatment Options

The most effective treatment for atrophic vaginitis is estrogen. Topical vaginal estrogen is an option that efficiently and specifically targets the vulvovaginal epithelium and is considered safe for most women. If other menopausal symptoms such as hot flashes or night sweats are present, systemic hormone replacement therapy (HRT) can be used. If severe infection is present, a short course of antibiotics targeting the dominant organism on culture (not infrequently

S. aureus) may be given prior to or concomitant with estrogen therapy.

For women who wish to avoid estrogen and who have mild symptoms, nonhormonal lubricants and vaginal moisturizers may suffice. Sexual counseling and advice regarding appropriate lubrication may be all the treatment that some women want or need. There are few data regarding the safety or efficacy of so-called natural remedies in the treatment of atrophic vaginitis.

Sexual Activity

Sex, with or without a partner, helps to decrease atrophy by improving circulation to the vulvovaginal tissues, and the vagina may benefit from the sex steroids, fatty acids, and prostaglandins found in seminal fluid. Thus, regular sexual activity helps maintain optimal vaginal health and sexual function. Masturbation may be broached as a normal, healthy alternative for women. In general, women should be counseled regarding the expected changes in sexual function associated with aging. Heterosexual women benefit from being informed of expected age-related changes in their male partners as well.

The premenopausal vagina can accommodate sexual activity in the unaroused state, but this is seldom the case after menopause, especially if estrogen is not used. Women and their partners need to know that changes in sexual routines may be necessary as both partners age, particularly if foreplay has been abbreviated in the past. Expansion of the sexual repertoire and liberal use of lubricants should be encouraged. Fortunately, there are good resources in this regard, and patients should be referred to these for support and suggestions.

Estrogen Therapy

Estrogen is a highly effective therapy for atrophic vaginitis and is FDA-approved for this use. As little as 1 month of estrogen reverts the vaginal pH and microscopic vaginal epithelium to a premenopausal state, although it can take prolonged use to restore vaginal elasticity and capacity in women with long-standing untreated atrophy.

For women whose symptoms of menopause are confined to atrophic vaginitis, topical vaginal estrogen is a safe and highly effective therapy (Crandall, 2002; Suckling, Lethaby, & Kennedy, 2003). Vaginal estrogen can be given as a cream containing conjugated equine estrogens (CEE), estradiol, estropipate, or dienestrol. Estradiol tablets and a ring are newer and increasingly used options. Estriol is available in the United States as a custom compound only. All are effective in reducing the symptoms and reversing the signs of vaginal atrophy.

Estrogen cream is introduced into the vagina with an applicator, but patients can be instructed to rub the cream into the outer tissues as well and to place a small amount of the cream on the outside of the applicator to aid insertion into the vagina. The cream should never be used for sexual lubrication. Vaginal tablets are inserted with an attached disposable applicator. The estrogen ring is placed in the vagina and is effective for 3 months of continuous use, after which it is replaced.

Both estrogen creams and tablets require an initial intense dosing regimen, once nightly for 2 weeks, decreasing to twice weekly thereafter. During the initial 2 weeks, patients should be advised that systemic absorption may result in some breast tenderness or even relief of systemic menopausal symptoms. Once the dose is reduced to twice weekly, any systemic absorption and symptoms should lessen.

There are limited data comparing vaginal estrogen preparations to one another in terms of efficacy or safety. CEE creams have been associated with more complaints of breast tenderness, bleeding, and perineal pain than estradiol tablets. Creams may be associated with increased endometrial stimulation compared to the vaginal estrogen ring, and the ring appears to be superior to creams in terms of patient acceptance.

Systemic absorption occurs with all vaginal estrogen preparations, but estrogen levels remain within the normal postmenopausal range and are usually undetectable with currently available clinical assays. Although this small amount of absorption should pose minimal risk for most women, it may be less acceptable risk in women with breast cancer who are taking aromatase inhibitors—medications whose efficacy is directly proportional to their ability to decrease estrogen levels below the normal postmenopausal range.

Despite the widespread use of vaginal estrogen, long-term endometrial safety data are surprisingly limited, with the longest study being 1 year for vaginal estradiol tablets. Case-control studies show no increase in endometrial cancer with vaginal estrogen use, but randomized placebo-controlled trials are of limited duration. Thus, no evidence-based recommendations exist for long-term use of vaginal estrogen. Serum-estrogen absorption appears to be highest in CEE and lowest in the vaginal ring. Although estriol cream has been reported to lack systemic absorption, there are no data to support this statement.

Clinicians have several options to ensure long-term safety of vaginal estrogen use. One option is to monitor the endometrium periodically with transvaginal sonogram. Other clinicians may prefer to periodically give a short course of progesterone treatment to induce withdrawal bleeding and prevent endometrial hyperplasia. Still others may monitor serum-estradiol levels at baseline and during treatment to reassure themselves and the patient that systemic absorption is minimal. This last approach may not be helpful until menopause and a hypo-estrogen state is well established and stable.

Some clinicians may choose to prescribe lower-than-recommended dosing, advising the patient to gradually decrease over time to the lowest dose that prevents symptoms. It is important not to cut back dosing till atrophy is reversed and symptoms are resolved. As little as a fourth to an eighth of standard dosing may be enough for many women.

Hormone Replacement Therapy

HRT is approved for use in treatment of menopausal hot flashes, vaginal atrophy, and osteoporosis. A full discussion of HRT is beyond the scope of this entry. Briefly, the risks of systemic hormone replacement as defined in the Women's Health Initiative, the largest randomized trial of this therapy, include breast cancer, stroke, and thromboembolism. Patients considering HRT should be counseled on its risks and benefits and encouraged to make an informed choice. Fears related to cancers and other health problems are common reasons for rejecting HRT and should be addressed.

Since publication of the findings of the Women's Health Initiative in 2002 (Writing Group for the Women's Health Initiative Investigators, 2002), lower does of systemic HRT have become popular. These lower doses, which may be sufficient to control vasomotor symptoms, may not control vaginal symptoms, and supplementation with vaginal estrogen may be necessary.

Nonpharmaceutical Treatments

A nonhormonal moisturizing vaginal gel (Replens®) used three times a week is useful in treating the symptoms and findings of vaginal atrophy. Although it is not as effective as vaginal estrogen in this regard, Replens® is an acceptable alternative for women unwilling or unable to use estrogens.

A wide variety of sexual lubricants for women with atrophic vaginitis can be found in stores and on the Internet, including KY jelly®, Astroglide®, Pjur®, Slippery Stuff®, and others. Patients and their partners should be encouraged to find a lubricant that works well for them and is enjoyable to use. In general, scented or flavored lubricants should be avoided because they may be more likely to irritate. Kegel exercises may improve the muscle tone of the vaginal canal.

Counseling regarding nonvaginal sexual activities may also be appropriate. General vulva care may be helpful to many women: keeping the area dry; wearing cotton underwear; and avoiding douches, sprays, perfumed soaps, and over-the-counter vaginal hygiene products such as Vagisil®.

Alternative Treatments

Patients may approach their health care providers with questions regarding the use of scientifically unproved complementary therapies in the treatment of atrophic vaginitis. For women with contraindications for HRT, some herbal remedies may be inappropriate due to their estrogenic effects.

Black cohosh or cemicifuga racemosa (Remfemin®) is an herb used extensively to treat menopausal symptoms (Mahady, 2005). Although large randomized placebo-controlled studies are still in progress, black cohosh preparations have been shown in several smaller studies to be more effective than placebo in the treatment of menopausal symptoms such as hot flashes. Black cohosh has also been shown to restore vaginal pH and epithelium without endometrial proliferation at currently recommended doses of 20 mg twice daily. Long-term safety data do not yet exist.

MARGARET POLANECZKY

See also

Alternative and Complementary Medicine
Sexual Health

Internet Resources

American College of Obstetricians and Gynecologists
http://www.acog.org

Iowa Women's Health Center
http://obgyn.uihc.uiowa.edu/patinfo/vulvar/vaginitis.htm

North American Menopause Society
http://www.nams.org

Sexuality Information and Education Council of the United States (SIECUS)
http://www.siecus.org/pubs/biblio/bibs0012.html

Women's Cancer Network
http://www.wcn.org

Women's Health Initiative
http://www.whi.org/

REFERENCES

Crandall, C. (2002). Vaginal estrogen preparations: A review of safety and efficacy for vaginal atrophy. *Journal of Women's Health*, *11*(10), 857–877.

ACOG Task Force on Hormone Therapy (2004). Genitourinary tract changes. *Obstetrics and Gynecology*, *104* (4) (Supplement), 56S–61S.

Bachmann, G. A., & Nevadunsky, N. S. (2000). Diagnosis and treatment of atrophic vaginitis. *American Family Physician*, *61*(10), 3090–3096.

Mahady, G. B. (2005). Black cohosh (*Actaea/Cimicifuga racemosa*): Review of the clinical data for safety and efficacy in menopausal symptoms. *Treatments in Endocrinology*, *4*(3), 177–184.

Suckling, J., Lethaby, A., & Kennedy, R. (2003). Local estrogen for vaginal atrophy in post-menopausal women. *Cochrane Database of Systematic Reviews, # 4*. Art. No.: CD001500. DOI: 10.1002/14651858.CD001500.

Writing Group for the Women's Health Initiative Investigators (2002). Risks and benefits of estrogen plus progestin in healthy postmenopausal women. *Journal of the American Medical Association*, *288*, 321–333.

AUTONOMY

Autonomy is the first of three major principles guiding medical ethics and sets the tone for those principles through its respect for personhood. The two other principles are beneficence/nonmaleficence and justice. Honoring autonomy can be a powerful component in planning elders' future health care and preserving their participation in decision making and adherence to the plan, but it can be an especially difficult concept to put into practice with seniors. In the clinical setting, providers often do not trust elder patients' capacity to make decisions, and elders are often reticent either to discuss difficult medical issues or to assert their autonomy or both.

Autonomy was best defined in a 1914 landmark case by Justice Benjamin Cardozo: "Every human being of adult years and sound mind has a right to determine what shall be done with his own body." This definition, acknowledging the autonomy of the patient, was the basis for Cardozo's ruling that if surgery is performed without the patient's consent, the surgeon commits a battery and the patient may sue for damages (*Schloendorff v. Society of New York Hospital*, 211 N.Y. 125, 105 N.E. 92). In short, every adult of sound mind has the right to self-determination—meaning that the patient can consent to or refuse treatment, provided the patient is capable of making the decision, a vital component of informed consent. Autonomy and self-determination also encompass the patient's right to make decisions for the future when he or she is no longer capable. Signing an advance directive (AD) such as a living will or a health care proxy documents these future wishes. As such, autonomy lies at the very root of medical care and the provider–patient relationship (Ahronheim, Moreno, & Zuckerman, 2000).

Establishing autonomy as the centerpiece of medical ethics and each person's right to informed consent has not been easy. In clinical settings, physicians and other providers often ignore a patient's articulated wishes. Even providers who honored their patients' decisions felt that patient autonomy threatened their relationship with physicians, nurses, and other health care providers. Providers feared that their own autonomy and freedom to recommend medical treatment would be seriously impaired.

What has often been overlooked is that the exercise of autonomy is not an absolute right. Patient autonomy ends where it collides or conflicts with that of another. Mutual respect demands that the provider's integrity and autonomy also be honored. Thus, a patient cannot demand an inappropriate treatment, intervention, or medication. Professionals have the right to refuse to act on a request. Similarly, a patient who decides to reject acute treatment cannot demand to be cared for by family or to go home without help if it is deemed unsafe. The patient must choose among reasonable options, which may include discharge to home with home care or placement in a long-term-care facility. Continuing to stay at an acute-care facility when such care is inappropriate is also not a reasonable option. At the same time, a family member or health care agent should not be able to overturn a decision made by the patient, even if the patient has lost decisional capacity. The patient's professed preferences supersede anyone else's decision, even when the proxy or surrogate is authorized to act.

When a patient makes a decision that runs counter to the provider's values, the patient's wishes prevail, but the provider does not have to compromise personal beliefs. For example, if a patient refuses artificial hydration and nutrition and the provider feels morally bound to feed the patient, the provider is obligated to honor the patient's wishes but can do so by referring the patient to another physician.

Yet, for individuals who retain the capacity to make decisions, autonomy empowers a patient to remain in control of his or her life by being able to consent to or reject a medical treatment or intervention, even if such treatment or intervention may be life-sustaining. (American Medical Association, 2001). The patient's decision consists of more than just medical information and recommendations. Autonomy recognizes that each person is unique and possesses his or her own set of religious or other values, traditions, and a sense of what life is about. A medical recommendation is only one consideration—albeit an important one—in making a health care decision. For the physician, nurse, or other clinician, the major consideration is which treatment is most likely to be curative or to prolong life. The patient, for personal reasons, may decide against the recommended treatment even though this decision may shorten life and may, in the provider's view, not be in the patient's best interest. The provider may encourage the patient to change his or her mind, but ultimately it is the patient's life and the patient's decision how to live that life.

Autonomy as a dominant principle may have some serious drawbacks. Robert Burt maintains that facing end-of-life decisions (i.e., death and dying), which the elderly perforce would need to confront were they to exercise their autonomous choice, are not issues that most people want to talk about or consider. Indeed, it is one reason why ADs have failed as a universal tool to protect autonomy when an individual is no longer able to make decisions (Burt, 2005). An elderly person in declining health and with diminishing mental capacities is especially vulnerable. Control over life and values is threatened when autonomy and right to self-determination are not respected. But Burt asks whether we have not overemphasized the importance of a person's autonomy and created a fiction by which unexpressed preferences are inferred when we invoke substituted judgment or rely solely on a previously executed document (e.g., a living will) (Burt, 2005).

The incapacitated elderly person, one who can no longer communicate any preferences and about whom we have no history of values or beliefs, is vulnerable but a far cry from the person who is alert but becoming frail. For the capacitated person, maintaining autonomy allows the full range of options: to take full responsibility for decision-making or abdicating that role by designating a family member or a named representative to make the decision for the elderly person. In the best-case scenario, a full discussion of medical preferences would be desirable, but if the patient relies on a representative to interpret his or her wishes, that too is up to the patient and need not be considered a breach of autonomy by physicians or other providers.

A person's capacity to make a particular decision is critical to autonomy. To make an informed decision, a person must have the ability to understand the nature and consequences of that decision (Ahronheim, Moreno, & Zuckerman, 2000). The patient should be able to repeat previously expressed statements and indicate an understanding of the specific decision. The level of capacity needed to make decisions varies with the degree of difficulty in understanding the information required to make a decision.

Patients can manifest waxing and waning capacity. Elderly people particularly may "sundown"—that is, be clear and lucid in the morning but lose clarity as the day wears on. In respecting a patient's autonomy, the patient should be consulted and asked to make decisions in the morning, during times of lucidity. If the provider is not convinced that the patient has made a conscious, deliberate decision, the provider should confirm the patient's wishes by asking a second and even a third and fourth time. A consistent response should be persuasive that the patient understands the decision made. For an incapacitated patient who has no AD and no surrogate decision maker, beneficence/nonmaleficence becomes the prevailing principle. This means that a clinician who is unable to establish the patient's preferences should be guided in making treatment decisions by the best interest (i.e., beneficence) of the patient and, as always, is charged to do no harm (i.e., nonmaleficience) (Ahronheim, Moreno, & Zuckerman, 2000).

Confidentiality of information is another component of patient autonomy (Beauchamp & Childress, 1994). Family members are not entitled to any information about the patient without his or her consent. In an era in which truth-telling in the interest of patient autonomy prevails, a family's desire to shield the patient from the truth or a provider's reluctance to share bad news with the patient can violate the patient's right to keep information private and obstruct his or her ability to make personal decisions. Only if permission is sought from the patient, or if the patient asks the provider to consult with or inform a family member, may the clinician reveal the information. In addition, the regulations required by the Health Insurance Portability & Accountability Act of 1996 went into effect in April 2003. These privacy regulations, meant to protect patient records and information, have had limited success in part because the rather complicated language has been frequently misinterpreted by health care administrators and practitioners.

Although autonomy is an essential part of personhood, empathy for elderly patients is essential if clinicians are to understand the fear experienced by patients when they are admitted to a medical facility, especially in an emergency. Providers must give elderly patients encouragement and assistance in making decisions. Respecting autonomy contributes to the health and welfare of elderly patients, allows maintenance of self-esteem, and may reduce fears regarding the loss of control common among elders.

ALICE HERB

See also

Advance Directives
Cultural Assessment
Patient–Provider Relationships

Substitute Decision Making
Sundowning

Internet Resources

American Bar Association Commission on Law and Aging
http://www.abanet.org/media/youraba/200512/article09.html

American Medical Association
http://www.ama-assn.org/ama/pub/category/2416.html

American Society of Bioethics and Humanities
http://www.asbh.org

American Society of Law, Medicine, and Ethics
http://www.aslme.org

The Hastings Center
http://www.thehastingscenter.org

U.S. Department of Health & Human Services
http://www.hhs.gov/news/facts/privacy.html
http://www.hhs.gov/news/facts/privacy.html

REFERENCES

Ahronheim, J. C., Moreno, J. D., & Zuckerman, C. (2000). *Ethics in Clinical Practice* (2nd ed.). Gaithersburg, Maryland: Aspen Publishers, Inc.

American Medical Association (2001). Medical Ethics, E-2.20, Withholding or withdrawing life-sustaining treatment. In T. L. Beauchamps & J. F. Childress (Eds.), *Principles of biomedical ethics* (5th ed.). New York: Oxford Press.

Beauchamp & Childress (1994). Beauchamp, T. L., Childress, C. F. (1994) Principles of Biomedical Ethics, (4th edition), Oxford University Press, Oxford.

Burt, Robert A. (2005). The end of autonomy, *Hastings Center Report, Special Report 3*, (6), S9–S13.

Schloendorff v. Society of New York Hospital (211 N.Y. 125, 105 N.E. 92) (2000).

B

BACK PAIN

Back pain is a common, morbid, and costly disorder of older persons. Of the 36 million persons living in the United States who are aged 65 years or older, approximately half report experiencing at least one episode of back pain in a calendar year, and nearly 20% report multiple episodes (Lawrence et al., 1998). Older adults with back pain are more likely than those who are pain-free to report social isolation, appetite disturbance, depressive symptoms, and substantial functional disability. For example, among 1,002 community-dwelling older women, severe back pain (defined as a pain score of 7 or more out of 10) was prevalent (i.e., 19%) and strongly associated with difficulty performing a wide range of activities of daily living (ADL) (Leveille et al., 1999). Furthermore, in a study of community-dwelling men and women aged 73 years and older, the number of months with back pain was found to be a strong and independent predictor of worsening lower-extremity physical function (Reid, Williams, & Gill, 2005). Back pain is also associated with significantly increased use of health services and is second only to respiratory infections as a cause of physician office visits (Luo, Pietrobon, Sun, Liu, & Hey, 2004).

Clinical Presentations and Assessment

Clinical presentations of back pain include acute-onset pain episodes that resolve over time, recurrent episodes of varying duration interspersed with pain-free intervals, and persistent pain. Although little is known about the longitudinal course of back pain in older adults, clinical experience suggests that once persistent pain develops, the likelihood of complete pain resolution is low.

Common causes of back pain in this age group include spinal stenosis, osteoarthritis, ligamentous strain, degenerative-disc disease, and vertebral fractures, as well as other disorders such as fibromyalgia, sacroiliac-joint disease, and referred pain due to osteoarthritis of the hips. Older adults often present with more than one disorder (e.g., degenerative-disc disease and spinal stenosis), whereas others present with a "new" pain etiology (e.g., acute vertebral fracture) superimposed on a persistent pain disorder (e.g., osteoarthritis). As described herein, a careful history and physical examination are mandatory for all patients who initially present with a chief complaint of back pain.

When performing a pain assessment, clinicians should inquire about the presence of multiple descriptors including ache, discomfort, and hurt because older adults often describe the unpleasant sensation using terms other than pain. They should obtain information about symptom onset (e.g., acute versus gradual) and duration, temporal pattern (e.g., constant versus intermittent), character (e.g., lancinating, stinging, tingling), location, and factors that exacerbate or relieve the pain. Patients presenting for an initial evaluation should also be asked about the presence of fever, unexplained weight loss, previous history of cancer, and whether pain wakes them from sleep. The presence of one or more of these "red flags" significantly increases the likelihood of an infectious or neoplastic process.

A variety of pain-intensity scales has been validated for use among older adults, including the 0 (no pain) to 10 (worst pain) numeric rating scale, verbal rating scales, pain thermometers that make use of descriptors of varying severity, and the faces pain scale. It is important to identify a scale that the patient is comfortable using and routinely administer the scale at subsequent visits to assess treatment efficacy. Clinicians should obtain information about current and previous treatments for pain, and they should ask about the use of complementary or alternative treatments, in light of the increasing number of Americans who report the use of nonallopathic therapies for pain. A pain history should also document the extent to which diverse functional domains (e.g., social, recreational, and physical) are affected and, if so, to what degree. The clinician should determine whether pain is interfering with a patient's ability to perform basic ADLs and instrumental IADLs, the effect of family or other caregiver support on the patient's pain experience, and the presence and level of depressive symptoms.

The physical examination should be thorough but focus on musculoskeletal and neurologic functioning. The straight (and crossed straight) leg-raise tests can be helpful maneuvers, particularly when the history is consistent with disk herniation. Most older adults with back pain report pain in multiple locations, and careful assessment for pain in other anatomic sites can aid in establishing a diagnosis. For example, pain in the back, knees, and ankles is most likely degenerative-joint disease.

Imaging (CT or MRI) should be reserved for patients with red-flag signs or symptoms, a history suggestive of a modifiable disorder such as acute vertebral fracture, demonstrated neurological deficits, or worsening pain despite therapy. Routine imaging is not cost effective and may fail to provide reassurance for patients or physicians. Previous studies of older asymptomatic adults documented substantial prevalence rates of significant spinal stenosis and degenerative-disc disease (Deyo, 2002). These data challenge the notion that a positive scan has high predictive value in establishing a diagnosis for back pain. Moreover, obtaining sensitive but poorly specific imaging procedures may lead to the administration of potentially unnecessary interventions with untoward treatment effects.

The diagnosis, as well as the degree and impact of pain on a patient's functioning at the time of the initial evaluation, should guide the frequency of follow-up assessments, which should include reassessment of change in level of pain, pain-related disability, and treatments used to manage pain. Regular assessment for depressive symptomatology is also warranted, particularly among treatment nonresponders.

Treatments

The selection of a treatment strategy depends on a patient's level of pain, degree of pain-related functional impairment, and condition causing the pain. Identifying a patient's treatment goals prior to initiating therapy is recommended and can enhance treatment engagement and adherence. Nonsurgical treatments are advocated for most causes of back pain because the natural history of many back-pain disorders remains poorly defined, concurrent comorbidities increase risk for poor surgical outcomes, and surgical success rates are highly variable. Nonsurgical interventions include pharmacologic, physical, psychological, and complementary therapies, and are briefly described herein.

With respect to medications, a trial of acetaminophen should be considered first for mild to moderate pain. Nonsteroidal anti-inflammatory medications are particularly effective in treating arthritis-related pain, but deleterious side effects and concerns about safety issues (particularly with COX-2 and possibly some COX-1 inhibitors) limit their use. The use of opioid medications for the treatment of back pain in older adults remains controversial. Although opioids can provide effective pain relief, the prevalence of undesirable side effects is significant. Recent evidence suggests that long-term use of opioid therapy in older adults with persistent back pain is associated with poorer cognitive functioning. A trial of adjuvant medications such as anticonvulsants (e.g., gabapentin), antidepressants (e.g., duloxetine), and topical analgesics (e.g., lidocaine patch) should be considered, particularly for pain of neuropathic origin. Regardless of the medication selected, clinicians are advised to start at the lowest possible dose and increase the dose slowly, given that the risk of adverse side effects increases significantly with age. Finally, epidural injections are frequently administered in the setting of a herniated disc or spinal stenosis. Although evidence supporting their efficacy is modest, most authorities recommend a trial of epidural injections prior to considering a surgical intervention.

Physical therapies are underutilized by older adults with back pain, have demonstrated efficacy, and can be safely employed for most causes of back pain. Individual therapies include stretching and strengthening exercises and are particularly recommended for individuals with persistent back pain who are at increased risk for functional decline. Other physical therapies such as heat and cold modalities, ultrasound, and massage may also provide benefit. Psychological therapies have demonstrated efficacy for the treatment of back pain, are infrequently used by older adults, and should be considered for use in those with persistent back pain. Patients receive instruction in how beliefs, emotions, and behaviors play a central role in determining their experience of pain, as well as instruction in the use of specific cognitive and behavioral skills to manage pain better. A large and growing number of complementary therapies (e.g., acupuncture, tai chi, and therapeutic touch) are available for the treatment of back pain. Some of the treatments may provide benefit and should be considered, particularly when conventional therapies have not helped. Surgical treatments should be considered for individuals with spinal stenosis and degenerative-disc disease who continue to experience high levels of pain and/or pain-related disability despite the use of first-line therapies. Newly developed minimally invasive surgeries are being developed and tested and will likely decrease surgical complication rates, leading to improved pain and functional outcomes.

Finally, regardless of the therapy selected, patients should be assessed regularly to determine whether a given treatment is producing positive or untoward outcomes. In addition, identifying and helping patients overcome barriers to the use of prescribed treatments could improve both adherence and treatment outcomes.

M. CARY REID

See also

Pain: Acute
Pain: Chronic/Persistent

Internet Resources

American Geriatrics Society
http://www.americangeriatrics.org/ products/positionpapers/oae_guidelines.pdf
http://www.americangeriatrics.org/products/chronic_pain.pdf

American Medical Association
http://www.ama-cmeonline.com/pain_mgmt/module05/01cme/04_01.htm

REFERENCES

Deyo, R. A. (2002). Diagnostic evaluation of low back pain: Reaching a specific diagnosis is often impossible. *Archives of Internal Medicine*, *162*, 1444–1448.

Lawrence, R. C., Helmick, C. G., Arnett, F. C., Deyo, R. A., Felson, D. T., Giannin, E. H., et al. (1998). Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. *Arthritis and Rheumatism*, *41*, 778–799.

Leveille, S. G., Guralnik, J. M., Hochberg, M., Hirsch, R., Ferruci, L., Langlois, J., et al. (1999). Low back pain and disability in older women: Independent association with difficulty but not inability to perform daily activities. *Journals of Gerontology*, *5*, M487–93.

Luo, X., Pietrobon, R., Sun, S. X., Liu, G. G., & Hey, L. (2004). Estimates and patterns of direct health care expenditures among individuals with back pain in the United States. *Spine*, *29*, 79–86.

Reid, M. C., Williams, C. S., & Gill, T. M. (2005). Back pain and decline in lower extremity physical function among community-living older persons. *Journals of Gerontology Series A: Medical Sciences*, *60*, M793–97.

BALANCE

Approximately 13% of community-dwelling adults ages 65 to 69 years (and about 46% of those 85 years or older) complain of balance problems or unsteadiness when walking or changing positions (U.S. Department of Health and Human Services, National Center for Health Statistics, 1996). The purpose of balance is to maintain the body's center of gravity, which is located anterior to the second sacral vertebra, over the body's base of support. Balance is a complex process that involves the coordination of afferent mechanisms or sensory systems (i.e., visual, vestibular, and proprioceptive) and efferent mechanisms or motor systems (i.e., muscle strength and flexibility). When the center of gravity extends beyond the body's base of support, the resulting imbalance is detected by the sensory and motor systems in an attempt to realign the body.

Effects of Aging on Balance

There is an age-related increase in unsteadiness under both static and dynamic conditions. Older adults tend to exhibit greater posterior and anteroposterior sway than lateral sway compared with younger individuals. These changes are due to a combination of decreased sensory input, slowed motor responses, and musculoskeletal limitations (Beauchet et al., 2005). Older adults attempt to compensate for these changes by using visual input when proprioceptive feedback is reduced or missing. For example, older adults may look down to view the correct placement of their feet when ambulating.

There is a delayed response to balance change in healthy older adults. A variety of age-related musculoskeletal changes influences balance. Kyphosis alters the body's balance by moving the center of gravity forward, making it more difficult to maintain standing balance. In some older adults, there is a reversal of the normal distal-to-proximal sequence of muscle activation following a change in balance. Although not a normal age change, older adults tend to have decreased muscle strength in the lower extremities. Decreased muscle strength complicates the execution of postural strategies and makes it more difficult for older adults to adjust their center of gravity.

Alterations in Balance Due to Disease

Neurological Conditions

Following a stroke, poor postural control is common and is attributed to vestibular dysfunction and visuospatial impairment (i.e., hemianopsia) or neglect (i.e., hemi-inattention). On the affected side, the sequence of postural muscle activation changes. Instead of the normal sequence of distal-to-proximal muscle activation, the proximal muscles of the hemiplegic or paretic extremity are activated first, impairing the individual's ability to initiate a quick postural response. Other neurological problems that influence balance include cerebellar degeneration, myelopathy, Parkinson's disease, and peripheral neuropathies.

Peripheral Vestibular Imbalance

Vestibular dysfunction may be either peripheral—involving the semicircular canals, utricle or saccule, vestibular nerve, and nuclei—or central, involving the brain stem and cerebellum. Episodes of vertigo may be due to age-related changes occurring in the vestibular portion of the inner ear, such as degeneration in the ampullary mechanism of the semicircular canal, labyrinthitis or vestibular neuronitis from infection, Meniere's disease, medications, head trauma, and degeneration of the cervical spine. Age-related declines in the hair cells of the vestibular system have not been directly associated with changes in balance (Meyerhoff, 2002).

Dizziness (Vertigo)

Dizziness is a common complaint of older adults and can result in imbalance. The causes of dizziness vary but can include peripheral vestibular disorders, strokes, central disorders, drug toxicity, cardiac problems, acute illnesses, and diabetes.

Treatment of Balance Disorders

A comprehensive evaluation should be conducted to determine whether there is a reversible cause of the balance problem, with a special focus on the neurological, sensory, and cardiac systems. Neurological evaluation should include mental status, position and vibration sense, deep-tendon reflexes, nystagmus, cerebellar function, and muscle strength. Musculoskeletal evaluation should include range of motion and muscle strength. Cardiac evaluation should include arrhythmia, bruits, valvular disorders, and postural hypotension. Sensory evaluation should include vision and hearing assessments. Medication use should also be evaluated; benzodiazepines, tricyclic antidepressants, anticonvulsants, and hypnotic sedatives can affect stability.

When no treatable disorder for the balance problems is found, existing function should be supported. Targeted exercise regimens aimed at strengthening lower-extremity muscles and improving joint flexibility and balance training designed to enhance sensory function can help improve balance (Choi, Moon, & Song, 2005; DiBrezzo, Shadden, Raybon, & Powers, 2005). Canes, crutches, and walkers increase stability by providing a wider base of support and additional sensory input, and they supplement muscle activity by assisting with both propulsion and deceleration during ambulation. Canes, the least restrictive of the gait aids, are fit properly if the handle of the cane is near the level of the greater trochanter so that when the cane is grasped, the elbow rests in 20 to 30 degrees of flexion. A cane is typically held on the side opposite the affected lower extremity, and the cane and affected leg are advanced simultaneously. During the stance phase of the gait cycle, weight is distributed between the cane and the affected leg. Walkers provide the most stable base of support and are indicated for those patients requiring maximal mechanical assistance for ambulation. Users should be advised to keep the walker out in front of them and to avoid the tendency to overstep into the walker. Rolling walkers can be more energy efficient but are difficult to use on carpeted and uneven surfaces and are not as safe as traditional walkers.

Barbara Resnick

See also

Activities of Daily Living
Gait Assessment Instruments
Gait Disturbances

Internet Resources

Centers for Disease Control: Physical Activity for Everyone
http://www.cdc.gov/nccdphp/dnpa/physical/recommendations/older_adults.htm.

National Institute on Deafness and Other Communication Disorders
http://www.nidcd.nih.gov/health/balance/baldizz.asp

National Institutes of Health: Senior Health: Exercise for Older Adults
http://www.nihseniorhealth.gov/exercise/balanceexercises/01.html

Physician and Sportsmedicine: Recommending Exercise to Healthy Older Adults
http://www.physsportsmed.com/issues/1999/10_15_99/kligman.htm

REFERENCES

Beauchet, O., Dubost, V., Herrmann, F., Rabilloud, M., Gonthier, R., & Kressig, R. W. (2005). Relationship between dual-task related gait changes and intrinsic risk factors for falls among transitional frail older adults. *Aging Clinics and Experimental Research*, *17*(4), 270–275.

Choi, J. H., Moon, J. S., & Song, R. (2005). Effects of Sun-style tai chi exercise on physical fitness and fall prevention in fall-prone older adults. *Journal of Advanced Nursing*, *51*(2), 150–157.

DiBrezzo, R., Shadden, B. B., Raybon, B. H., & Powers, M. (2005). Exercise intervention designed to improve strength and dynamic balance among community-dwelling older adults. *Journal of Aging and Physical Activity*, *13*(2), 198–209.

Meyerhoff, W. (2002). Age-related ENT disorders. *Geriatrics*. Available at http://www.geri.com/geriatrics/article/articleDetail.jsp?id=15137

U.S. Department of Health and Human Services, National Center for Health Statistics (1996). *Health United States*, 1995. Report No. DHHS Pub. No. (PHS) 96-1232. Hyattsville, MD.

BEHAVIORAL SYMPTOMS IN PATIENTS WITH DEMENTIA

The more than 4 million Americans currently affected with dementia exhibit behaviors that caregivers often describe as agitated, disruptive, or disturbing. Behavioral symptoms often lead to caregiver frustration, burnout, and injury; increase the potential for elder mistreatment; and contribute greatly to the high cost of caring for those with Alzheimer's disease and other dementias, including hospitalization and long-term institutional living.

The incidence of behavioral symptoms reaches more than 90% during the course of the illness. Among community-dwelling older adults with dementia, more than 80% exhibit some symptoms from onset and, for 60%, the level is clinically significant (Lawlor, 2004). Among all nursing-home residents, behavioral symptoms occur in 64% to 91%; for nearly 80% of those with dementia, symptoms reach clinical significance. In addition to physical and verbal aggressive behaviors, older adults with dementia commonly display pacing, disrobing or sexual disinhibition, wandering, apathy, sleep disturbance, and agitation or restlessness. Knowledge about the correlates of behavioral symptoms is limited to the recognition that they occur primarily in the context of personal grooming, pain, depression, and functional and/or cognitive impairment.

Assessment

It is important to avoid judgmental terms such as "disruptive" or "disturbing," which focus only on the caregiver's response rather than on the communication. Labeling may lead to attempts to control the behavior to minimize caregiver disruption. Caregivers should be encouraged to focus on and describe nonjudgmentally the actual behavior observed using terms such as "hitting," "biting," or "yelling." This is more likely to promote identification of causes or triggers and an understanding of the meaning of the behavior, which in turn promote effective care strategies targeted at meeting individual needs. Two models in current use to help assess and respond to behavior in dementia are Progressively Lowered Stress Threshold (PLST) and Need-driven Dementia-compromised Behavior (NDB). In common are the recognition of the interplay of person, context, and environment. Physical assessment to rule out medical problems is critical and neuropsychological testing can provide valuable information on diagnosis, retained cognitive abilities, and potentially effective strategies for coping with behavioral symptoms.

Research has shown that aggressive behavior usually occurs on a continuum, wherein anxiety is exhibited first, progressing to verbal behavior, and, with no intervention, resulting in physically aggressive behavior. Thus, the goal of individualized care is to meet needs in the earliest stage of the behavior to prevent progression to aggression. Families and primary caregivers should be encouraged to keep a behavior log to track each occurrence; the log should note time, environment, persons present, and any other relevant information. During a careful assessment process, the log is invaluable to help identify patterns, triggers, early warning signs, and unmet needs for targeted intervention, especially nonpharmacological strategies. By engaging them in a proactive problem-solving process, keeping a log can also serve as an intervention for the helplessness experienced by families and caregivers.

Treatments

In the past, behavioral symptoms were most frequently contained using physical restraint and psychoactive drugs. A large body of research demonstrates not only lack of efficacy but also the multiple adverse consequences, even death, from physical-restraint use. Physical-restraint use has been associated with increased behavioral symptoms in several studies. In some states, the inappropriate use of physical restraints is a crime involving neglect of a care-dependent person. Federal regulations have placed significant restrictions on the use of physical restraints, in response to public outcries about the dangers of their use.

Nonpharmacological interventions should be the first response to and the mainstay of safe treatment for behavioral symptoms in older adults with dementia (Desai & Grossberg, 2001; Snowden, Sato, & Roy-Byrne, 2003). An environment that is familiar and soothing does much to prevent or decrease behavioral symptoms. A proper balance of sensory input can significantly affect behavior, positively or negatively. Improved lighting and use of color contrasts can help overcome fear during grooming activities by providing an environment that the older adult can easily distinguish and navigate. Light therapy (approximating sunlight) improves sleep and daytime behavior and function. Personal-care practices should be evaluated to ensure that caregivers are focusing on individual comfort and needs rather than task completion. Many specific strategies have been developed for altering personal care to minimize behavioral symptoms. Some of these include focusing on the person and relationship rather than the task, using one-step directions, offering simple choices, and altering the form of grooming, such as giving a towel bath rather than a standard shower (Rader et al., 2006).

Appropriate communication style, content, and complexity can reduce behavioral symptoms in older adults with dementia. Strategies that appear to be helpful are the use of short, grammatically simple sentences; definite nouns; and repetition. Careful attention to facial affect, tone of voice, and gestures of the older adult yield much information about unmet needs. In addition, the caregiver's own nonverbal communication of anger or frustration, through a tense affect or high-pitched tone of voice, is associated with increased behavioral symptoms in the older adult.

Planning activities that are meaningful and enjoyable for the older adult can reduce behaviors due to boredom. Individualized music therapy and hand massage have also demonstrated positive outcomes (Snowden, Sato, & Roy-Byrne, 2003). Activities should be carefully planned to capitalize on preserved abilities and based on previous job tasks or hobbies. Activities should be scheduled to balance stimulation and rest because fatigue is thought to increase behavioral symptoms. Adult day care or a psychiatric day hospital program, if depression is present, can help meet needs for meaningful activities. Efforts to humanize long-term-care facilities, with attention to balancing quality of life with quality of care through changes in structure, function, and relationships, should decrease behavioral symptoms in dementia but await confirmatory research (Desai & Grossberg, 2001).

Family and caregiver education and counseling are critical for successful coping with behavior symptoms. Caregivers need to understand the non-intentional nature of the elder's coping behaviors to reframe their perceptions from "problem" to "expression of a need." Education should focus on ways to maximize the older adult's remaining capabilities. Family and caregiver interactions may worsen behavior if overly demanding or "testing" of cognitive abilities. Families may need assistance and education in how to structure visits so that they are mutually enjoyable for the older adult and the family, including development and use of life story/memory books, thus helping to buffer the strain often observed in caregivers. Finally, respite—or time away from caregiving—to prevent burnout is an important part of any intervention plan for an older adult who exhibits behavioral symptoms.

The evidence base for use of psychoactive drugs to control behavior in older adults with dementia is currently inconclusive. Few drug studies demonstrate efficacy for any specific behavior, and older adults with dementia are particularly prone to serious drug side effects. Unfortunately, rather than targeting a specific symptom in the patient for which the drug is known to be effective, caregiver distress and demand is frequently the reason that a drug is initiated. Careful assessment is required prior to initiating psychoactive drug use, and the general geriatric rule to "start low, go slow" especially holds true in their use. A trial of nonpharmacological interventions, treatment of any comorbid medical problems, and a partial or complete drug holiday are recommended as part of an evaluation before initiating drug treatment. Correction of impaired vision or hearing may reduce aggressive behaviors that are secondary to sensory deficits. Pain and discomfort from acute or chronic medical conditions or constipation/impaction may masquerade as a variety of symptoms. Pain is often underrecognized and undertreated in this population; thus, the use of routine rather than as-needed analgesia is important in treating chronic pain in older adults with dementia, often resulting in improved behavioral symptoms (Miller et al., 2005).

Given the state of research on psychoactive drugs and their widespread misuse in the past, only cautious recommendations can be made regarding their use for behavioral symptoms. Psychosis, manifested as hallucinations, delusions, or paranoia, is an appropriate indication for antipsychotic drugs that have been shown to be effective for these target symptoms, but there is no clearly established efficacy for agitation. Newer antipsychotic drugs, such as risperidone, olanzapine, or quetiapine, may have fewer side effects for older adults with psychoses. In general, antipsychotics have only a modest benefit above that of placebo (Lawlor, 2004). Caregivers must have a high suspicion of depression when behavioral symptoms are present. A therapeutic trial of a serotonergic antidepressant is often recommended whenever depression is indicated or suspected. Benzodiazepine drugs are of limited value for behavioral symptoms, and the risk of falls increases with dose and length of drug half-life. Case reports suggest that buspirone or trazodone may be helpful in decreasing behavioral symptoms. Case studies report decreased behavioral symptoms with the use of antimanic and antiseizure drugs and decreased aggressive sexual behavior in men with the use of female hormones; however, the research evidence again is insufficient to recommend their use. There is some anecdotal information that cognitive enhancers, such as donepezil, may also reduce behavioral symptoms.

KAREN TALERICO
LOIS K. EVANS
LENORE H. KURLOWICZ

See also

Dementia: Nonpharmacological Therapy
Dementia: Pharmacological Therapy
Nursing Homes
Restraints

Internet Resources

ADEAR Center
http://www.alzheimers.org/

Alzheimer's Association
http://www.alz.org/

American Journal of Geriatric Psychiatry
http://ajgponline.org/cgi/content/abstract/8/2/123

REFERENCES

Desai, A. K., & Grossberg, G. T. (2001). Recognition and management of behavioral disturbances in dementia. *Primary Care Companion Journal of Clinical Psychiatry*, *3*(3), 93–109.

Lawlor, B. A. (2004). Behavioral and psychological symptoms in dementia: The role of atypical antipsychotics. *Journal of Clinical Psychiatry*, *65* (Supplement 11), 5–10.

Miller, L. L., Talerico, K. A., Rader, J., Swafford, K., Hiatt, S. O., Millar, S. B., et al. (2005). Development of an intervention to reduce pain in older adults with dementia: Challenges and lessons learned. *Alzheimer's Care Quarterly*, *6*(2), 154–167.

Rader, J., Barrick, A. L., Hoeffer, B., Sloane, P. D., McKenzie, D., Talerico, K. A., et al. (2006). The bathing of older adults with dementia. *American Journal of Nursing*, *106*(4), 40–49.

Snowden, M., Sato, K., & Roy-Byrne, P. (2003). Assessment and treatment of nursing home residents with depression or behavioral symptoms associated with dementia: A review of the literature. *Journal of the American Geriatrics Society*, *51*, 1305–1317.

BENIGN PROSTATIC HYPERPLASIA

Lower urinary tract symptoms (LUTS) are very common in elderly men. Benign prostatic hyperplasia (BPH) is the most common etiology, but other problems can cause infravesical obstruction as well, including prostate cancer, urethral strictures, bladder stones, bladder cancer, pelvic tumors, and foreign material.

The pathophysiology of BPH is related to a combination of mechanical (i.e., glandular hypertrophy) and/or functional (i.e., smooth muscle tone) obstruction. At the same time, the bladder wall might undergo changes as well, either due to the usual changes in the bladder innervation and smooth-muscle function seen with aging or secondary to the infravesical obstruction.

LUTS consist of a mixture of obstructive and overactive bladder (OAB) symptoms. Hesitancy, intermittency, a weak stream, Valsalva voiding, postmicturition dribbling, and incomplete emptying suggest obstruction. Urgency, urge incontinence, frequency, and nocturia suggest OAB. Some of these symptoms might be exacerbated by medication (prescribed or over-the-counter [OTC]).Validated symptom scores like the International Prostate Symptom Score (IPSS) are frequently used to assess these symptoms as well as the impact on the quality of life (Garcia-Losa et al., 2001). Severe obstruction can lead to acute or chronic urinary retention with eventual deterioration of the renal function. Associated conditions are urinary tract infection (UTI), bladder calculi, hematuria, and overflow incontinence. Hematuria always requires further investigation.

Evaluation includes the patient's general condition and cognitive function, life expectancy, co-morbidities, and a review of his current medication. The prostate evaluation focuses on the exclusion of prostate cancer and the prostate size and includes assessment of the Prostate Specific Antigen (PSA), digital rectal examination, transrectal ultrasound, and, when indicated, prostate biopsy. Prostate size does not correlate with the degree of symptoms but is relevant to the selection of the right medical or surgical treatment. A cystoscopy is optional and can be performed to check for urethral of bladder pathology that could be mistaken for BPH. Ultrasound of the upper urinary tract can detect uretero-hydronephrosis in cases of chronic overflow incontinence or severe obstruction. A creatinine measurement is always necessary.

A urodynamic investigation consists minimally of a uroflowmetry and measurement of the postvoid residual. Flow rates below 15 ml/sec are suggestive for obstruction. Avoiding dairy foods during 48 hours will give information about functional bladder capacity, frequency, and nocturia. More advanced urodynamic investigations such as pressure-flow studies are optional, although to some extent these can predict the outcome of therapeutic interventions.

Treatment

The treatment of LUTS/BPH is tailored to the severity of the symptoms and the impact on the quality of life (Disantostefano, Biddle, & Lavelle, 2006). Co-morbidities have to be considered when choosing an appropriate treatment (O'Leary, 2006). Patients with mild symptoms without postvoid residual can be reassured. Watchful waiting is indicated.

More severe symptoms can be managed with medication following some principles. Men with a large prostate (i.e., greater than 40 grams) can benefit from 5α-reductase blockers such as finasteride or dutasteride. These drugs reduce the risk for urinary retention and subsequent prostatectomy and have few side effects. They induce a nearly 50% decrease in the PSA levels but do not hamper the early diagnosis of prostate cancer. Alpha-blockers such as prazosin, terasozin, doxazosin, and tamsulosin can result in a rapid improvement of symptoms. Side effects include headaches, dizziness, postural hypotension, asthenia, retrograde ejaculation, and nasal congestion. These side effects may limit their use in some elderly men. Phytotherapy with serenoa repens and pygeum africanum have shown nearly similar results as α-blockers and can be used as alternatives (Boyle, Robertson, Lowe, & Roehrborn, 2004).

If OAB symptoms are dominant, a trial with anticholinergic medication can be undertaken. In patients without significant postvoid residual, this does not lead to an increased risk for urinary retention (Chapple & Roehrborn, 2006). Close follow-up of the residual is necessary initially.

Surgical treatment is warranted for men with moderate to severe symptoms who do not respond to medical therapy and for men with severe symptoms (e.g., significant postvoid residual) or urinary retention. Hematuria due to BPH, secondary hydronephrosis, and recurrent UTIs can be other indications to perform a surgical treatment.

Surgical prostatectomy results in a significant subjective and objective improvement. Transurethral resection of the prostate (TURP) is the gold standard. Mortality is very low (i.e., less than 0.25%). The risk for incontinence is about 2% to 5%. The risk for developing bladder-neck contracture or urethral strictures post-TURP is 3.8%. Retrograde ejaculation will occur in 70% of men. The impact on erectile function is less clear because other co-morbidities and age may play a role as well. The incidence of post-TURP erectile dysfunction is about 7%. Smaller prostate glands (i.e., less than 30 gr.) can be managed by a transurethral incision rather than resection. Larger prostates (i.e., greater than 60 gr.) can be treated by an open prostatectomy.

Minimally invasive procedures might be useful in the elderly population (Naspro et al., 2005). Laser prostatectomy can be indicated in those taking anticoagulant medication or who are unfit for TURP. Transrectal high-intensity focused ultrasound (HIFU), transurethral microwave thermotherapy (TUMT), and transurethral radio-frequency treatment or transurethral needle ablation (TUNA) can be used in some indications, but the follow-up and the number of studies is limited (De la Rosette et al., 2006). Medical treatment as well as surgical treatment might interfere with sexual function, which can still be relevant to elderly men. Patient counseling on sexual side effects is imperative (Miner, Rosenberg, & Perelman, 2006).

The follow-up of men with LUTS/BPH consists of regular assessment of the symptoms, uroflowmetry, and postvoid residual. PSA measurement and digital rectal examination are to be repeated yearly. Patients who are not operative candidates can be treated with permanent or intermittent catheterization. Intermittent catheterization is only useful if the patient can perform it himself. If not, a suprapubic catheter can be placed under local anesthesia. Regular changes of the catheter (i.e., every 4 to 12 weeks) are necessary. In case of acute urinary retention, a suprapubic catheter allows a trial voiding followed by a check of the postvoid residual. Transurethral catheters are only indicated for temporary relief of urinary retention; if used for a longer time, complications such as prostatitis, urethritis, and urethral damage may occur.

DIRK DE RIDDER

See also

Cancer Treatment
Health Promotion Screening

Internet Resources

American Urological Association
http//www.urologyhealth.org

The European Association of Urology
http//www.uroweb.org

National Institute of Diabetes & Digestive & Kidney Diseases (NIDDK)
http//www.niddk.nih.gov

The Urology Channel
http//www.urologychannel.com/prostate/bph/index.shtml

REFERENCES

Boyle, P., Robertson, C., Lowe, F., & Roehrborn, C. (2004). Updated meta-analysis of clinical trials of Serenoa repens extract in the treatment of symptomatic benign prostatic hyperplasia. *British Journal of Urology International*, *93*(6), 751–756.

Chapple, C. R., & Roehrborn, C. G. (2006). A shifted paradigm for the further understanding, evaluation, and treatment of lower urinary tract symptoms in men: Focus on the bladder. *European Urology*, *49*(4), 651–659.

De la Rosette, J. J. M. C. H., Alivizatos, G., Madersbacher, S., Rioja Sanz, C., Nordling, J., & Emberton, M., et al. (Eds.) (2006). *European Association of Urology Guidelines*. Arnhem, The Netherlands: European Association of Urology.

Disantostefano, R. L., Biddle, A. K., & Lavelle, J. P. (2006). An evaluation of the economic costs and patient-related consequences of treatments for benign prostatic hyperplasia. *British Journal of Urology International*, *97*(5), 1007–1016.

Garcia-Losa, M., Unda, M., Badia, X., Rodriguez-Alcantara, F., Carballido, J., & Dal-Re, R., et al. (2001). Effect of mode of administration on IPSS scores in a large BPH patient population. *European Urology*, *40*(4), 451–457.

Miner, M., Rosenberg, M. T., & Perelman, M. A. (2006). Treatment of lower urinary tract symptoms in benign prostatic hyperplasia and its impact on sexual function. *Clinical Therapeutics*, *1*, 13–25.

Naspro, R., Salonia, A., Colombo, R., Cestari, A., Guazzoni, G., & Rigatti, P., et al. (2005). Update of the

minimally invasive therapies for benign prostatic hyperplasia. *Current Opinion in Urology*, *1*, 49–53.
O'Leary, M. P. (2006) Treatment and pharmacologic management of BPH in the context of common comorbidities. *American Journal of Managed Care*, *12*(5), S129–S140.

BEREAVEMENT

The loss of a significant other, especially a spouse, can be one of the most stressful experiences of a person's life. More than 900,000 people are widowed each year, the majority of whom are 65 years old or older. Conjugal loss may be particularly stressful for older adults because they are often losing an important longtime companion and confidant at a time in life when their social networks may already have become quite attenuated.

In this discussion, the term *bereavement* is used to refer to the objective event of the loss. *Grief* or *grieving* is used to refer to the emotional reactions that follow that loss. *Mourning* is used to refer to the social expression of grief, including mourning rituals.

The Course of Grief

Current research suggests that there is no single "typical" pattern of grief. That is, although past research had suggested that the usual course of grieving was an initial significant increase in distress with the death followed by a gradual decline in distress over the first year, these conclusions were drawn from "averaging" the grief patterns of many individuals as a group. However, a closer examination of the grief reactions of older spouses by Bonnano and his colleagues (Bonanno et al., 2002; Boerner, Wortman, & Bonanno, 2005) documented no less than five separate patterns of grief responses. Similar patterns of grief have been replicated in other samples (Aneshensel, Botticello, & Yamamoto-Mitani, 2004). Bonanno and colleagues (2002), who assessed individuals before the death of their spouse and then followed them for up to 4 years after their loss, found that the most frequently observed pattern of grief (51%) following the loss of a spouse was one in which the bereaved experienced little or no distress either before or after the bereavement. Contrary to early concerns among clinicians that the absence of grief symptoms might reflect ongoing denial of the loss that would eventually lead to a delayed grief reaction, when this same group was followed for 4 years postbereavement, they exhibited consistently low levels of distress with no evidence of delayed grief (Boerner, Wortman, & Bonanno, 2005). Despite the fact that many of the bereaved spouses were highly resilient or recovered quickly from the bereavement experience, a substantial proportion (i.e., 26%) did report high levels of distress following the loss (Bonanno et al., 2002).

Finally, there is evidence that for some, the anticipation of the loss and/or the burden of caregiving prior to loss may be more stressful than the loss itself. Specifically, 11% of bereaved spouses exhibited high levels of distress prior to the bereavement, but distress declined dramatically by 6 months following the loss and remained consistently low for the 4 years postbereavement that spouses were followed (Bonanno et al., 2002; Boerner, Wortman, & Bonanno, 2005). Nearly identical grief responses were also found among 17% of caregivers of Alzheimer's patients following the death of a care recipient (Aneshensel, Botticello, & Yamamoto-Mitani, 2004).

Complicated Grief

Although most bereaved spouses experience a significant alleviation of their distress within the first year or so following the death, for a minority the loss results in protracted adjustment problems in the postbereavement period. This may indicate bereavement-related depression or anxiety for which intervention may be indicated (Harwood, 2001). Further, an estimated 10% to 20% of bereaved individuals may experience complicated grief, which is characterized by a persistent sense of disbelief and anger regarding the death, recurring painful emotions, and preoccupation with thoughts of the deceased (Prigerson et al., 1999). Although such grief reactions may be common early in the grief process, they have been found to diminish significantly 18 months following the death (Bonanno et al., 2002). Thus, for those for whom these symptoms persist, assessment to determine whether professional intervention is needed may be warranted.

Risk and Protective Factors

Various factors have been identified as either risk factors for adverse grief reactions or psychological resources that may lower such risk. There is a substantial and growing body of research to suggest that women experience far less negative mental and physical health consequences from spousal bereavement than men (Stroebe, Stroebe, & Schut, 2001). This may be because women are more likely to cope with loss by acknowledging, expressing, and addressing their emotions, whereas men are more likely to cope by trying to avoid the emotional impact of the loss and rather focus on addressing practical problems that arise from the loss.

Some evidence suggests that older adults seem to suffer less anguish over the loss of a spouse (Parkes, 1997). Given the prevalence of illness, disability, and death among the elderly, older adults may not perceive serious illness and death as "off-time" events as young adults might. Older adults may have anticipated and been able to emotionally prepare for and rehearse the loss prior to the actual experience of bereavement. Elders may, however, suffer more physical morbidity and mortality following spousal death, particularly in the 6 months immediately following the bereavement (Harwood, 2001).

Although research findings are inconsistent on this point, some studies have suggested that when the death is unexpected or sudden, the absence of an opportunity to anticipate the loss can enhance the risk of a poor outcome (Carr, House, Wortman, Nesse, & Kessler, 2001). Conversely, too long a period of preparation (e.g., more than 6 months) can also result in higher distress postbereavement (Carr et al., 2001). This may be particularly true for family caregivers.

Among the protective factors that have been identified is good social support in the period following the loss. Both emotional support (e.g., having someone to express emotions to and confide in) and instrumental support (e.g., practical assistance) have been found to promote greater resilience against distress following bereavement (Aneshensel et al., 2002; Bonanno et al., 2004). Social support may facilitate adjustment in a number of ways, including forestalling social withdrawal and the resulting loneliness, helping the bereaved to manage new tasks that must be assumed, and affording the bereaved a chance to express and work through feelings about the loss.

Individual-level resources such as feelings of self-esteem, mastery, optimism, and coping self-efficacy have also been associated with a reduced likelihood of experiencing consistently high levels of distress postbereavement (Aneshensel et al., 2004; Bonanno et al., 2002). Having a belief system that allows one to make sense of the loss has also long been suggested as important for adjustment to bereavement. Indeed, the beliefs that things happen for a reason and that death is a natural part of life have each been found to be associated with more resilient grief patterns (Bonanno et al., 2002). Religious faith may also be of value by offering a belief system that enables the survivor to transcend the loss or accept it as part of a larger plan, although some research has failed to find a connection between religious beliefs and patterns of grief response (Bonanno et al., 2002).

Helping the Bereaved Cope With Loss

In coping with loss, the bereaved can benefit from supportive interventions. Yet, bereaved individuals may sometimes direct the anger they feel toward the deceased or the loss toward others (e.g., doctors or the health care system), driving away potentially valuable sources of support. Individuals against whom this anger is directed should be encouraged to take a tolerant attitude toward the bereaved, attempt to endure the hostility, and recognize that it is part of the reaction to the loss. The bereaved will benefit from being able to express anger, both by gaining a greater recognition and acceptance of their feelings and by not having to direct them inward.

Unfortunately, although there is often adequate support for bereaved spouses immediately following the loss and at the time of the funeral, family and friends tend to withdraw after the first month or two. Others may hold unrealistic expectations about how quickly the bereaved should accept the loss and "get on with life." They may not recognize that the bereaved may need ongoing emotional support and practical assistance, especially if they must assume new tasks and responsibilities as a result of the loss. Bereavement support groups can be a venue in which they may gain mutual support from others going through the same experience, share coping strategies, and have their insecurities about functioning without the deceased normalized and allayed.

Whether depressed bereaved individuals should be treated with medications after the first few months following a loss is debated. Some professionals contend that sadness, lethargy, and other depressive symptoms are normal and should not be interfered with; other professionals argue that depression following a loss can and should be treated with medication. They assert that because depression distorts grief work, it increases the likelihood of poor adaptation and therefore should be alleviated.

In the absence of professional intervention or adequate informal social support, older adults cope with loss in a number of ways. Some may distract themselves with activities so as not to think about the deceased. Others use alcohol, drugs, or excessive eating to blunt their pain. More adaptive choices include turning to religion as a framework for finding meaning in loss and thereby facilitating acceptance. Involvement with religious institutions may also offer support through the personal relationships forged with clergy or fellow congregants. It may also help bereaved individuals overcome the sense of loneliness that many older widows and widowers experience.

Karolynn Siegel
Eric W. Schrimshaw

See also
Palliative Care

Internet Resources

AARP
http://www.aarp.org/families/grief_loss

HealthyPlace.com
http://www.healthyplace.com/communities/depression/related/loss_grief.asp

National Library of Medicine/National Institutes of Health
http://www.nlm.nih.gov/medlineplus/bereavement.html

REFERENCES

Aneshensel, C. S., Botticello, A. L., & Yamamoto-Mitani, N. (2004). When caregiving ends: The course of depressive symptoms after bereavement. *Journal of Health and Social Behavior*, *45*, 422–440.

Boerner K, Wortman C. B., Bonanno G. A. (2005) Resilient or at risk? A 4-year study of older adults who initially showed high or low distress following conjugal loss. *Journals of Gerontology of Series B, Psychological Sciences and Social Sciences, 60*(2): 67–73.

Bonanno, G. A., Wortman, C. B., Lehman, D. R., Tweed, R. G., Haring, M., Sonnega, J., et al. (2002). Resilience to loss and chronic grief: A prospective study from preloss to 18-months postloss. *Journal of Personality and Social Psychology*, *83*, 1150–1164.

Carr, D., House, J. S., Wortman, C. B., Nesse, R., & Kessler, R. C. (2001). Psychological adjustment to sudden and anticipated spousal loss among older widowed persons. *Journal of Gerontology: Social Sciences*, *56B*, S237–S248.

Harwood, D. (2001). Grief in old age. *Reviews in Clinical Gerontology*, *11*, 167–175.

Parkes, C. M. (1997). Bereavement and mental health in the elderly. *Reviews in Clinical Gerontology*, *7*, 47–53.

Prigerson, H. G., Shear, M. K., Jacobs, S. C., Reynolds, C. F., Maciejewski, P. K., Davidson, J. R. T., et al. (1999). Consensus criteria for traumatic grief: A

rationale and preliminary empirical test. *British Journal of Psychiatry*, *174*, 67–73.
Stroebe, M., Stroebe, W., & Schut, H. (2001). Gender differences in adjustment to bereavement: An empirical and theoretical review. *Review of General Psychology*, *5*, 62–83.

BOWEL FUNCTION

The age-related slowdown in gastrointestinal motility, in combination with nervous-system, endocrine, and vascular changes, contributes to alteration in patterns of bowel elimination. Straining and feelings of incomplete evacuation of stool are the most frequently reported bowel problems in older people (Bellini et al., 2006). However, bowel constipation and bowel-related illnesses are not typical of normal aging (Linton & Lach, 2006); the changes are not in themselves pathological, nor do they cause diseases such as colon cancer, constipation, or diverticulitis.

Several factors promote normal bowel function in older people, including mobility and exercise, adequate fluid and fiber, and privacy and positioning during bowel elimination. Culture and health belief systems also influence bowel function. Appropriate bowel-function management includes assessment of clinical, lifestyle, and psychosocial aspects of an older person.

Assessment

Bowel assessment requires a comprehensive history that focuses on past and present health-related behaviors, including bowel habits, laxative use, and frequency and consistency of stool; circumstances resulting in variations, such as anxiety, stress, or spicy food "triggers," that affect elimination; dietary habits; exercise and activity levels; typical fluid intake; past or concurrent diseases, such as colorectal cancer, diverticulitis, and neurological, musculoskeletal, or endocrine disorders; and beliefs and values regarding bowel elimination.

Medication history is important, especially regarding use of aspirin, ibuprofen, anticoagulants such as warfarin, antacids, antidepressants, antipsychotics, anticholinergics, antidiarrheals, laxatives, and over-the-counter (OTC) drugs. Older people are the prime consumers of both prescription and OTC medications. Moreover, they frequently experience adverse and toxic reactions to drugs. Many medications carry side effects of intestinal irritation and diminished or increased peristalsis that affect bowel pattern. The clinician must carefully analyze each medication for interactions and side effects.

Physical examination must include abdominal assessment; observation of asymmetry and bulges; auscultation of bowel sounds; palpation for stool; and percussion for densities, masses, or stool. The rectal digital exam looks for rough and bulging surfaces (a possible sign of prostate hypertrophy), asymmetry, and fecal impaction, and tests for sphincter-muscle tone. Diarrhea can mask fecal impaction; liquid stool oozes around the fecal mass. An abdominal flat plate may be needed to confirm the presence of fecal impaction higher in the intestinal tract.

Diagnostic tests to assess bowel dysfunction include stool for occult blood, barium enema, flexible sigmoidoscopy, colonoscopy, anorectal manometry, studies of fecal transit time, defecography, and electrogastrography.

Environment and Body Rhythms

When an individual's body rhythms are disturbed, his or her sense of security and bowel rhythm are challenged. Sleep-wake patterns and eating and activity patterns vary from person to person and give individuals a sense of congruity and constancy. For some, a daily bowel movement is normal; for others, every other day is the norm. Each person has a unique rhythm. Something as simple as skipping a meal or staying up a few additional hours changes how individuals function, including their usual pattern of elimination.

An older person's surroundings might not support regular bowel elimination. The accompanying Table B.1 illustrates environmental

TABLE B.1 Bowel Issues: The Environment and Corrective Interventions

Environmental Issue	Corrective Measure
Lengthy bedroom-to bathroom distance or need to climb stairs	Put commode in private area of daytime living space
Lack of privacy during bowel elimination	Use folding dividers to partition space; leave the person, after ensuring safe positioning
Too many changes in daily routine, foods, fluids, and activity patterns	Provide structure, not rigidity, in mealtime, fluids, snacks, and recreation
Changes in sleep-wake pattern	Maintain similar sleeping and waking times, except for special events and activities
Complicated or layered clothing, such as buttons, girdles, and full-length stockings	Keep clothing simple yet comfortable and stylish. Examples: jogging suits, simple underpants and shirts, pants with elasticized waist, Velcro closures
Immobility and dependence on others for toileting	Schedule and pace toileting; ensure that caregivers are aware of the individual's needs; use a bell or call-light system; have mobility evaluated by a physical therapist and teach the person to increase mobility if possible
Lengthy travel without access to toilet	Identify rest stops in advance
Unusual body position and place that requires the individual to use a bedpan, such as spending the night away from home, hospitalization, bed rest, hip or long-bone fracture or surgery	Caregivers and nurses must ask the individual about toileting on an hourly basis; allow the individual adequate time after proper positioning, given restrictions; offer sufficient fluids and fiber first, rather than laxatives; reassure the individual that the situation is temporary and that a normal routine will be resumed

factors that should prompt concern and corrective measures.

Fiber and Fluid

Dietary habits and adequate fluid and fiber intake directly affect bowel habits. The lower the fiber, the higher the risk for breast and colon cancer (Caygill, Charlett, & Hill, 1998; Negri, Franceschi, Parpinel, & LaVecchia, 1998). Fluid intake should range between 1,500 and 2,000 mL daily, barring fluid restriction. Water, as opposed to caffeinated or sugar-based beverages, is recommended. Bottled waters, additions of lemon or lime to water, and juices cut in half with water are all better-quality fluid choices. Sugarless gelatin and ice pops are also alternatives to high-sugar carbonated beverages or beverages containing caffeine, which have a diuretic effect.

Dietary fiber is classified as soluble or insoluble. Fluid binds with insoluble fiber, which is found in foods such as nuts, seeds, some vegetables, and whole-grain products. Once in the large intestinal tract, it expands and facilitates a feeling of fullness and need for defecation. Without fiber, fluid, and activity, constipation is likely. In response, bearing down and straining occur. Some older people experience episodes of dizziness and fainting from the straining because of vagus-nerve stimulation.

Recommended dietary fiber intake for adults is 20 to 35 grams per day. A sudden increase in dietary fiber can cause gas, diarrhea, and bloating. Fiber should be added slowly by allowing a few days for adjustment to each graduated increase. Excessive fiber intake can interfere with the absorption of some nutrients. It is also important to drink plenty of water when consuming a lot of fiber. The clinician should recommend the desirable amount of fiber for each patient, particularly for those with cardiac and renal disease.

Fiber intake does not need to be unpalatable or even noticeable. One-half cup of oat or wheat bran or wheat germ may be added to meatloaf, hamburgers, or turkey burgers without compromising flavor. Individuals who do not like vegetables or fruits, or who are unable to chew fresh produce, may need blended fruits and vegetables added to soups, stews, gravies, muffins, and cakes as a portion of the liquid ingredient. For those who enjoy salads, a tossed green salad with 1 to 2 teaspoons of olive oil and spices such as parsley, oregano, chives, and cumin may reduce straining associated with constipation. Whole wheat, rye, and pumpernickel are better high-fiber alternatives to white bread. Starches and refined carbohydrates move slowly through the digestive tract, causing bloating and flatulence and promoting constipation. Eating three dried prunes daily is also recommended.

Mobility

Walking and other activities encourage venous and lymphatic circulation and movement, which carry toxins away from and out of the body. For many, a brisk walk in the morning or evening prompts a bowel movement. The health benefit of regular exercise and activity is clearly identified as a preventive measure for heart disease, hypertension, and osteoporosis; exercise also reduces stress and enhances well-being. Concentrated effort and commitment to ambulate frail older people two or three times daily can be beneficial. The simple formula of "walking and talking" (i.e., physical and cognitive stimulation) is recognized as a global principle in enhancing human living.

Psychosocial Variables

Psychosocial effects on a person with bowel dysfunction may include feelings of shame and low self-esteem. The individual internalizes these feelings by withdrawing from family functions, relationships, and social situations, which may lead to depression. Bowel dysfunction may cause changes in lifestyle as well as personal hygiene. The older adult may restrict all outside activities. Routines such as church-going may cease. What was once a source of support and comfort may now be a source of anxiety, anger, fear, or guilt. Acknowledgment of these feelings by the caregiver and health professional gives the needed support to the individual.

Managing bowel patterns through a planned program of changes in the environment, nutrition, activity, and medications of an older person contribute to efficient bowel rhythms and a sense of security.

CORA D. ZEMBRZUSKI

See also

Fecal Incontinence
Gastrointestinal Bleed
Gastrointestinal Diseases
Gastrointestinal Physiology
Urinary Incontinence
Urinary Incontinence Assessment

Internet Resources

American Gastroenterologic Society
http://www.gastro.org/index.html

Food and Nutrition: Dietary fiber an essential part of a healthy diet
http://www.mayoclinic.com/health/fiber/NU00033

Incontinence on the Internet
http://www.InContiNet.com

International Foundation for Functional Gastrointestinal Disorders
http://www.iffgd.org

REFERENCES

Bellini, M., Alduini, P., Bassotti, G., Bove, A., Bocchini, R., Sormani, M. P., et al. (2006). Self-perceived normality in defecation habits. *Digestive Liver Diseases*, *38*(2), 103–108.

Caygill, C. P., Charlett, A., & Hill, M. J. (1998). Relationship between intake of high fiber foods and energy and the risk of cancer of the large bowel and breast. *European Journal of Cancer Prevention*, *7* (Suppl. 2), 11–17.

Linton, A. D., & Lach, H. (2006). *Matteson & McConnell's Gerontological Nursing: Concepts and Practice* (3rd ed.). Philadelphia: Saunders.

Negri, E., Franceschi, S., Parpinel, M., & LaVecchia, C. (1998). Fiber intake and risk of colorectal cancer. *Cancer Epidemiology Biomarkers & Prevention*, *7*(8), 667–771.

BREATHING

See
Dyspnea

BRUISES

See
Skin Issues: Bruises and Discoloration

BUILDING ACADEMIC GERIATRIC NURSING CAPACITY AWARDS PROGRAM

In 2000, in partnership with the American Academy of Nursing, the John A. Hartford Foundation (JAHF) launched a multimillion dollar Building Academic Geriatric Nursing Capacity (BAGNC) Scholars Award Program to produce expert researchers, academicians, and practitioners to lead the field of gerontology nursing and ultimately improve the care of the elderly. The initiative has three components: support for five Centers of Geriatric Nursing Excellence (CGNEs), scholar awards, and a Coordinating Center at the American Academy of Nursing.

The JAHF selected five schools of nursing that have demonstrated the highest level of commitment to the field; have both current experience and future potential to build the next generation of gerontological nurses; have outstanding capacity in research, practice, and education; manifest leadership that transcends their own institution; and meet generally accepted criteria of excellence. The five JAHF Centers of Geriatric Nursing Excellence are at the following schools:

Oregon Health & Science University
The University of Arkansas for Medical Sciences College of Nursing
The University of California–San Francisco School of Nursing
The University of Iowa College of Nursing
The University of Pennsylvania School of Nursing

The BAGNC program attracted additional partners who share the same goals. In 2004, The Atlantic Philanthropies of New York City infused support into the Postdoctoral Fellowship Awards and now supports 50% of all selected Fellows. At the same time, the Mayday Fund provided additional funding for selected Scholars and Fellows who focus on the study of pain in the elderly.

At the core of the BAGNC program are the Scholars and Fellows—people selected because of their outstanding commitment to geriatric nursing and recognized potential for future leadership. Producing expert academicians, practitioners, and researchers who will lead the field of geriatric nursing will ultimately improve the care of elders in our society. As of July 2005, 102 people had participated in the program.

The New York University Hartford Institute Geriatric Nursing Scholar & Fellows Program provides doctorally prepared nurses with an in-depth mentoring experience with nationally recognized gerontological nursing researchers in a week-long, intensive summer seminar at New York University.

EDITORIAL STAFF

Internet Resources

Building Academic Geriatric Nursing Capacity Awards Program
http://www.geriatricnursing.org/default.asp

NYU Hartford Institute Geriatric Nursing Scholar & Fellows Program
http://www.hartfordign.org/research/scholarsFellows/index.html

BURNS AND RELATED SAFETY ISSUES

Because elderly burn patients suffer from greater morbidity and mortality than younger patients with similar burn extents, preventing burns is paramount to continuing functionality and quality of life. Burns are largely explainable by characteristics of both the individual and the physical environment that interact to produce the burn and associated sequelae. In a cross-section survey of burn-injury survivors 65 years of age and older, Redlick and colleagues (2002) found that 85% of the subjects believed that their burns were preventable.

Risk Factors

Visual and other sensory changes, slower reflexes, changes in balance and equilibrium, medication side effects, and changes in cognition contribute to fire-related injuries. Cigarette smoking causes almost 50% of all residential fires. The use of space heaters, fireplaces, and heating pads; faulty electrical wires; lack of smoke detectors and fire extinguishers; scalding liquids; and prolonged exposure to the sun can lead to burn injuries in older adults (Kennedy-Malone, Fletcher, & Plank, 2000). Poverty is one of the strongest risk factors for fatality in a residential fire because poor families tend to dwell in old structures built without adequate fire protection, alarms, exits, and sprinklers. Isolated elderly persons and those who live in poverty are also more likely to have untreated or inadequately treated chronic health conditions that may compromise their mobility or mental functioning, which compounds their risk for injury due to fire.

Assessment

History

A complete history of the incident should be obtained, including substances involved, duration of exposure, emergency treatment, and overall condition of the victim before the incident, including mental status, medical diagnoses, medications, and prior history of burn injuries.

Physical Examination

The physical examination should include assessment of vital signs and of the burn area and surrounding tissues. A respiratory-system examination may also be warranted. General management of burns requires the assessment of the extent and severity of the burn injury, using the "rule of nines" (Kennedy-Malone et al., 2000). The total body area is divided into percentages equal to multiples of nine, with the head and neck, right upper extremity, and left upper extremity counted as 9% each. The anterior chest and abdomen, posterior chest and abdomen, right lower extremity, and left lower extremity each count as 18%. The genitalia are counted as 1%. The percentages are totaled to determine the extent of the burn injury, which can then be classified by severity based on the percentage of body surface area (BSA) involved, as follows:

- small (less than 15% BSA)
- moderate (15% to 49% BSA)
- large (50% to 69%)
- massive (70% or greater BSA)

Only second- and third-degree burns are included when calculating the total BSA.

Treatment

Immediate treatment for a burn is to apply cold water with wet towels or, if possible, immerse the burned area in cold tap water until the burn is free of pain both in and out of the water. First-degree burns can be treated with cold, wet compresses to limit the extent of the injury and analgesics to reduce pain as needed. Second- and third-degree burns should be irrigated with sterile saline followed by application of a topical antibiotic such as silver sulfadiazine to reduce the incidence of burn-wound infection. A sterile occlusive dressing, such as coarse mesh gauze, should then be applied. Dressings should be changed daily if topical antibiotics are not used and twice daily if they are used. For patients with second- and third-degree burns and an infection at the burn site, a sample of the wound should be cultured and the appropriate antibiotic prescribed. Tetanus prophylaxis is recommended for second- and third-degree burns.

Outpatients should be seen 72 hours after the burn injury for examination of the burn site and surrounding tissues for signs of healing or impending infection. The patient may need to be evaluated weekly until progressive healing is noted. Older adults who have suffered moderate or major burn injuries require hospitalization. Outpatients being treated for burns may require referral to a physical therapist for wound therapy if the extent of the burn or scarring interferes with the performance of activities of daily living (Kennedy-Malone et al., 2000).

Prevention of Burns: Fire Safety Recommendations

Counseling elderly persons on specific measures to prevent injuries, in conjunction with efforts to improve mobility, coordination, and sensory function, is the recommended approach to reducing the risk of accidents. The following are specific fire safety recommendations.

Portable Electric Heaters

- Avoid using extension cords unless it is absolutely necessary. If an extension cord must be used with an electric heater, make sure it is marked with a power rating at least as high as that of the heater itself. Keep the cord stretched out. Do not permit the cord to become buried under carpeting or rugs. Do not place anything on top of the cord.
- Never place heaters on cabinets, tables, furniture, or the like. Never use heaters to dry wearing apparel or shoes.
- Other useful tips regarding woodstoves, fireplaces, kerosene heaters, and gas space heaters can be found in articles (e.g., “Holiday Fire Safety Tips,” “Fire Prevention,” and “Preventive Home Modification”) from the Life@Home Web site (http://www.lifehome.com/artl1006.htm).

Cooking Equipment

- Never place or store potholders, plastic utensils, towels, and other noncooking equipment on or near the range because these items can be ignited.
- Roll up or fasten long loose sleeves with pins or elastic bands while cooking. Do not reach across a range while cooking. Long loose sleeves are more likely to catch on fire than short sleeves and are also more apt to catch on pot handles, overturning pots and pans and causing scalds.
- Consider purchasing garments that can be removed without having to pull them over the head. Clothes that are easily removed can help prevent serious burns. If a garment can be quickly stripped off when it catches fire, injury will be far less severe or avoided altogether.
- Shelves should not be placed above the cooking area because clothing may catch on fire. Also, if the stove is near a window, avoid draperies on that window. Install venetian blinds or miniblinds instead of curtains because curtains may catch on fire easily with the stove located below them (see “Seniors: Making Your Home Safer,” http://www.lifehome.com/artl0148.htm).
- Scalds can be prevented by turning down the thermostat on the household water heater to 120° F.
- Forgeting boiling water is the major reason for dry fires in homes of older adults (Warde, 1997). Because of their forgetfulness, older adults with mild dementia need to be evaluated for cooking safety.

Mattress and Bedding

- DO NOT smoke in bed. Multiple injuries and deaths have been attributed to older persons falling asleep while smoking (Leistikow & Shipley, 1999). Keep lighters and matches out of the reach of elderly persons who are bedbound or otherwise impaired and have difficulty using lighters and matches safely.
- Smokers should consider replacing an old mattress with a new one. Mattresses manufactured since 1973 are required to resist cigarette ignition.

- Do not sleep with a heating pad turned on. Tucking in the sides of an electric blanket or placing additional coverings on top of it can cause excessive heat buildup, which can start a fire.

Smoke Detectors: Fire Safety Recommendations

- Ensure that smoke alarms are positioned in key places throughout the home (e.g., in a hallway directly outside the bedroom). Smoke detectors should be placed on each level of the home, including the basement.
- Ensure that smoke detectors are working properly. Batteries should be tested often to make certain they are working. If smoke detectors in the home are hardwired, make sure that at least one of them has battery backup. This detector should be placed at the highest level of the house.
- For hearing-impaired individuals, smoke detectors are available with strobe lights to signal the presence of smoke and/or fire.
- If a disabled person (e.g., someone who is wheelchair- or bed-bound, confused, or disoriented) lives in the home, contact the local fire department for assistance in identifying and installing special early-warning devices and request assistance in setting up and practicing an escape plan (Harvey et al., 1998).

Chemical Burns and Injuries

- Inadvertent skin exposure and ingestion of household chemicals, herbicides, or pesticides have been linked to deaths or burn injuries in the older population (Lanson, 1997). Misinterpretation of the label or the visual difficulties of older persons may lead to improper usage. When labels are written in small print, older adults with visual deficits should be instructed to ask for a large-print version of the label. All hazardous household cleaning substances should be stored where it is difficult for an older adult with cognitive impairment to access them. Emergency personnel should be contacted for any accidental poisoning in the home. In most areas, the local Poison Control Center can be reached by calling 1-800-222-1222 or 911.

Maria Pappas

Internet Resources:

Elderly Health Services: Burns and Scalds
http://www.info.gov.hk/elderly/english/healthinfo/burn-e.htm

National Agricultural Safety Database: Kitchen Safety
www.cdc.gov/nasd/docs/d000801-d000900/d000825/d000825.html

New York State Office for the Aging
http://www.aging.state.ny.us/links

Life@Home
http://www.lifehome.com/arctl1006.htm
http://www.lifehome.com/artcl0148.htm

REFERENCES

Centers for Disease Control and Prevention (1998). Deaths resulting from residential fires and the prevalence of smoke alarms: United States. *Journal of the American Medical Association*, *280*(16), 1395.

Harper, R. D., & Dickson, W. A. (1995). Reducing the burn risk to elderly persons living in residential care. *Burns*, *21*(3), 205.

Harvey, P. A., Sacks, J. J., Ryan, G. W., & Bender, P. F. (1998). Residential smoke alarms and fire escape plans. *Public Health Report*, *113* (5), 459–464.

Kennedy-Malone, L., Fletcher, K., & Plank, L. (Eds.) (2000). *Management Guidelines for Gerontological Nurse Practitioners*. Philadelphia: F. A. Davis.

Lanson, S. (1997). Pesticide poisoning: An environmental emergency. *Journal of Emergency Nursing*, *23*(6), 516.

Leistikow, B. N., & Shipley, M. J. (1999). Might stopping smoking reduce injury death risks? A meteanalysis of randomized, controlled trials. *Preventive Medicine*, *28*(3), 255.

Redlick, F., Cooke, A., Gomez, M., Banfield, J., Cartotto, R. C., & Fish, J. S. (2002). A survey of risk factors for burns in the elderly and prevention strategies. *Journal of Burn Care Rehabilitation*, *23*(5), 351–356.

Warde, J. (1997). The healthy home handbook: All you need to know to rid your home of health and safety hazards. New York: Random House.

C

CALORIC INTAKE

Calories are units of energy. In the nutrition arena, the term *calorie* refers to the amount of energy in food and the amount of energy the body uses. Calories from food come from carbohydrates (4 calories/gram), protein (4 calories/gram), fats (9 calories/gram), and alcohol (7 calories/gram).

Good health requires a balance between the calories needed by the body and the calories consumed. An imbalance of calories often has negative health outcomes. Unintended weight loss in older adults is predictive of declining health. Excess calories contribute to obesity and more complex health problems, including loss of independence.

To provide more flexibility with the balance of calories, increasing physical activity to burn more calories increases total calorie needs and increases the maximum amount of calories a person can consume without gaining weight. Consuming nutrient-dense foods that are relatively low in calories also offers flexibility in the amount of food that can be eaten.

Indirect calorimetry most accurately determines calorie needs. Historically, the availability of calorimeters was limited to research settings so formulas are used to provide an estimate. The Harris-Benedict Equation is a well-known formula for estimating resting metabolic rate (RMR), which is the largest component of the total calorie expenditure. A recent systematic review of the literature on formulas indicates that the Mifflin–St. Jeor Equation is the most reliable predictive measure of resting metabolic rate (Frankenfield, Roth-Yousey, & Compher, 2005). Unfortunately, there are limited data on the use of predictive formulas in older adults and they are less accurate when used with obese adults. The RMR calculation is adjusted for physical activity and injury factors to provide the total estimated calorie needs (see Tables C.1 and C.2).

TABLE C.1 Activity Factor

Confined to bed	1.20
Ambulatory	1.30
Normal activity	1.50–1.75
Extremely active	2.00

TABLE C.2 Injury Factor

Postoperative (no complications)	1.00–1.05
Long fracture	1.15–1.30
Wound healing	1.20–1.60
Sepsis	1.75–1.85

Mifflin–St. Joer Equation

Men: $\text{RMR} = (9.99 \times \text{weight}) + (6.25 \times \text{height}) - (4.92 \times \text{age}) + 5$

Women: $\text{RMR} = (9.99 \times \text{weight}) + (6.25 \times \text{height}) - (4.92 \times \text{age}) + 161$

A short-cut method for estimating adult calorie needs per kilogram of body weight is to divide the weight in pounds by 2.2 and multiply by 25 to 35 (Niedert & Dorner, 2004).

Normal Ranges

In adults, anthropometric indicators of calorie balance include the following measurements: height, weight, waist circumference, middle-upper-arm circumference, various skin-fold thickness and other extremity circumference measures, body mass index (BMI) (i.e., weight in kilograms divided by height in meters squared), waist-to-hip ratio, and percent body fat. Bioelectrical impedance devices, underwater weighing, or other technologies can be used to estimate lean and fat mass. BMI is widely used to estimate body composition and health risk. However, it does not reflect the variable height loss with age. Thus, if height decreases while the weight remains the same, an individual's BMI increases, which may not be a true indication of nutritional status. Healthy older adults should have a BMI between 25 and 29 (Niedert & Dorner, 2004). For older individuals, maintenance of usual body weight is important for nutritional health. Usual body weight is the preferred standard for older adults (Niedert & Dorner, 2004).

Low Calorie Intake

Chronic low calorie intake in older adults contributes to weight loss and under-nutrition, which have been associated with negative health outcomes, including the development of pressure ulcers, cognitive problems, infections, hip fractures, muscle weakness, edema, and increased mortality. Low body weight and unintentional weight loss are predictive of increased morbidity and mortality, with individuals at the lowest BMI being at the greater risk. Weight loss is an indicator of declining nutritional status and can be identified before clinical signs and symptoms of overt malnutrition occur.

Unintended weight loss also has a negative impact on physical functioning and ability to perform activities of daily living (ADL), such as walking, standing, and bathing. Loss of 5% in 1 month or 10% in 6 months is considered a significant change. Because of the negative consequences of weight loss, nursing-home regulations require routine monitoring of residents' weights and appropriate interventions to prevent weight loss. Identification of weight loss can help ensure appropriate and timely nutritional interventions (Niedert & Dorner, 2004).

Weight loss may occur for numerous reasons including cancer, depression, dementia, medication, disorders of the gastrointestinal tract, age-related changes in taste and smell, functional disability that impede a person's ability to consume food, including chewing problems or increased frailty. Overly strict diets, such as low salt or low fat, may also contribute to weight loss and poor nutrient intake in older adults. Nutrition therapy must balance medical needs with individual desires to maximize nutritional intake and prevent excessive weight loss and functional decline (Niedert & Dorner, 2004).

Older adults have fragile homeostatic mechanisms that easily become imbalanced because of reduced physiological reserves. Hospitalized older individuals are at risk of weight loss due to the unfamiliar setting, nothing-by-mouth or liquid diet status for tests or surgery, loss of strength and independence, and inadequate assistance with meals.

The goals of nutrition screening and interventions include maintenance of optimal nutritional status; maintenance of a reasonable weight or weight restoration, if underweight; oral or enteral supplementation if food intake is inadequate to meet nutritional needs and the individual wishes intervention; adequate protein and fluid intake; appropriate restorative interventions to facilitate food intake (e.g., swallowing evaluation, appropriate meal-time positioning and assistance, assistive feeding devices); evaluation of cognitive and emotional status and implementation of behavior strategies to enhance cognition and address feeding problems; evaluation of oral health status and provision of appropriate dental hygiene; assessment of medications and modification of prescriptions to improve food intake, if possible; referral to social service intervention programs to meet specific identified needs (e.g., home-delivered meals, housekeeping assistance, medications management, transportation assistance, food assistance programs, if needed); exercise to promote appetite and increase stamina and independence; and moderation or abstinence in alcoholic-beverage intake.

Excess Calorie Intake

Many Americans are consuming calories in excess of needs as manifested in the high prevalence of overweight and obesity. In 1999–2000, 65% of all adults were overweight and 30% were obese (Dietary Guidelines for Americans, 2005).

Obesity among older persons is an important contributor to disability. Obesity may be associated with hypertension, diabetes mellitus, cardiovascular disease, and osteoarthritis. It can have profound functional and psychosocial consequences. As older adults suffer functional limitation, activity levels and consequent energy expenditure are further reduced. Decreased function and increased dependency may be considered failure to thrive as a result of obesity (Niedert & Dorner, 2004).

Quality of life worsens as weight increases. Depression is common in obese older persons. Obesity treatment in the older population needs to include interventions that address psychosocial concerns (Jensen & Rogers, 1998).

Lifestyle Changes

Incorporating lifestyle changes or implementing prescribed diet modifications is a complex process and is dependent on the individual's readiness to change. Exploring a person's values, beliefs, and priorities in life along with establishing specific, short-term, and measurable goals is helpful for successful implementation of the prescribed lifestyle or diet modification. The most successful strategies for weight loss include a modest goal for losing 10% of the body weight with a loss of 1/2 to 1 pound a week and maintenance of weight loss (Dietary Guidelines for Americans, 2005).

Dietary interventions for obese older persons should focus on good nutrition using "My Pyramid" as a guideline. A diet limited to 35% or less of the calories coming from fat that also provides high fiber, adequate protein, and fluids is recommended. Portion control and avoidance of high-calorie snacks may be adequate to result in weight loss when accompanied by 30 to 60 minutes of moderate exercise daily (Dietary Guidelines for Americans, 2005). Resistance exercises two to three times a week using resistance machines, elastic bands, or simple weight-lifting devices can preserve or increase muscle mass in older adults and especially

TABLE C.3 Making Foods Calorie- or Nutrient-Dense

Milk and Dairy Products	Fruit	Vegetables
Switch to whole milk Use half and half or double-strength milk (fluid milk mixed with powdered milk) for cereal, in beverages, in cooking Add cheese to sandwiches and casseroles	Blend ice cream or yogurt with fruits Roll fruit in nuts or dip in chocolate	Stuff vegetables with cottage cheese, cream, pimento cheese, or other cheese Use full-fat salad dressings
Meat and Meat Substitutes		Bread or Grain Products
Use ground nuts or seeds in place of bread crumbs Increase use of meat, egg, or chicken salad for sandwich fillings Add deviled eggs as a side dish		Stuff biscuits, rolls, muffins, or breadsticks with cheese before baking Add nuts and dried fruit to cereals, quick breads, cookies, cake, or other baked products
		Fats
		Increase fat content of the diet as tolerated through the use of butter, margarine, mayonnaise, peanut butter, and oils

during planned weight loss (Evans & Cyr-Campbell, 1997).

Health benefits in older adults can be achieved with small changes in lifestyle, including increasing physical activity, resistance exercises, and maintaining a calorie intake that supports a healthy weight.

CARLENE RUSSELL

See also

Eating and Feeding Behaviors
Feeding: Non-oral
Obesity

Internet Resources

American Dietetic Association
http://www.eatright.org

Dietary Guidelines for Americans 2005
http://www.health.gov/dietaryguidelines/

Calculate your own body mass index
http://nhlbisupport.com/bmi/

Identify individual calorie needs and meal plan
http://www.MyPyramid.gov

REFERENCES

Dietary Guidelines for Americans (2005). U.S. Department of Agriculture. Available at http://www.health.gov/dietaryguidelines/

Evans, W. J., & Cyr-Campbell, D. (1997). Nutrition, exercise, and healthy aging. *Journal of the American Dietetic Association*, *97*, 632–638.

Frankenfield, D., Roth-Yousey, L., & Compher, C. (2005). Comparison of predictive equations for resting metabolic rate in healthy nonobese and obese adults: A systematic review. *Journal of the American Dietetic Association*, *105*(5), 775–789.

Jensen, G. L., & Rogers, J. Z. (1998). Obesity in older persons. *Journal of the American Dietetic Association*, *98*, 1308–1311.

Niedert, K. (1965). American Dietetic Association position paper: Liberalization of the diet prescription improves quality of life for older adults in long-term care. *Journal of the American Dietetic Association*, *105*, 1955–1965.

Niedert, K., & Dorner, B. (2004). *Nutrition Care of the Older Adult*. Chicago, IL: American Dietetic Association (2nd ed.).

CANCER TREATMENT

Cancer is the most common cause of death and a major cause of morbidity for persons age 65 and older in the United States. Approximately 50% of all cancer patients are age 65 and older, and this percentage is likely to increase with the expansion of the older population (Balducci & Ershler, 2005; Yancik & Ries, 2004).

Causes

The association of cancer and age may be accounted for by two non–mutually exclusive explanations. First, carcinogenesis is a time-consuming process. The development of cancer requires that a person live several years from the original exposure to the initiating factor. Second, to some extent, cellular aging mimics carcinogenesis and primes the aging cells to the effects of late-stage carcinogens (i.e., promoters). The enhanced susceptibility of older individuals to late-stage carcinogens suggests that older individuals may benefit from chemoprevention.

A third mechanism may facilitate development of cancer in older individuals: senescence of the stroma; proliferative senescence of fibroblasts is associated with production of tumor growth factors (Campisi, 2004).

Biology

In at least five types of cancer, the prognosis changes with patient age (see Table C.4). In studying the mechanism through which age may influence the biology of cancer, it is helpful to distinguish a "seed effect," involving changes intrinsic to the tumor cells, from a "soil effect," involving changes in the physiology of the older person. For example, the worse prognosis for acute myelogenous leukemia (AML) in older individuals may be accounted for mainly by changes related to the malignant cells; in the case of lymphoma, the soil effect appears predominant. The prognosis of lymphoma may worsen in the aged

TABLE C.4 Change in Prognosis Based on Patient Age

Cancer	Change in Prognosis with Age	Mechanism
Acute myelogenous leukemia	Worse	Increased resistance to chemotherapy due to increased prevalence of glycoprotein P–mediated multidrug resistance Increased prevalence of unfavorable chromosomal abnormalities Involvement of the pluripotent hemopoietic stem cells by the neoplastic process
Non-Hodgkin's lymphoma	Worse	Increased circulating levels of interleukin-6
Breast cancer	Improved	Increased prevalence of hormone receptor–rich well-differentiated tumor cells Decreased cell proliferation Decreased circulating concentrations of estrogen Decreased mononuclear cell reaction to the primary tumor, with decreased production of growth-stimulating cytokines
Ovarian cancer	Worse	Unknown
Non–small cell lung cancer	Improved	Unknown

because the circulating concentration of interleukin-6 increases with age. In the case of breast cancer, both the seed and the soil effects may contribute to produce a tumor with a more indolent course.

Despite the influence of age on prognosis, chronological age should not determine the treatment of individual patients. Even though the prognosis for AML becomes worse with age, as many as 65% of patients older than age 60 may obtain complete remission of their disease, and a number of them may be cured. Although 60% to 80% of older women present with hormone-responsive breast cancer, the remaining 20% to 40% present with aggressive disease in need of aggressive cytotoxic chemotherapy (Balducci, Silliman, & Diaz, 2004).

Prevention

Primary prevention of cancer involves the elimination of environmental carcinogens and the administration of substances that may offset carcinogenesis (i.e., chemoprevention). The feasibility of chemoprevention has been shown in randomized controlled trials: *cis*-retinoic acid prevents second malignancies of the head and neck, the selective estrogen receptor modulator tamoxifen reduces the incidence of breast cancer in women at risk of developing the disease, and the 5-hydroxylase inhibitor finasteride has been shown to prevent some prostate cancer (Beghe & Balducci, 2005). Other substances undergoing active investigation include raloxifene and aromatase inhibitors for breast cancer and nonsteroidal anti-inflammatory drugs for colon cancer. Seemingly, older individuals benefit at least as much as younger individuals from primary prevention of cancer because they may be more susceptible to environmental carcinogens. In the case of chemoprevention, however, it is important to establish whether the reduction in cancer-related mortality and morbidity outweighs the complications of the treatment.

Secondary prevention of cancer involves screening of asymptomatic persons at risk. The positive predictive value of screening tests, such as mammography or fecal occult blood test, may improve with the age of the population due to increased prevalence of cancer. At the same time, the benefits of screening may be lessened due to the decreased life expectancy of the aged and the effects of previous screening, which may have eliminated the majority of "prevalence" cases. There is no clear evidence that screening mammography reduces the breast cancer–related mortality in women older than 70 or that screening for colorectal cancer reduces the cancer-related mortality in persons older than 80. In the absence of randomized and controlled studies, it appears reasonable to institute some type of screening program for any person with a life expectancy of at least 3 years because the benefits of screening first become apparent 3 years after the beginning of the screening program. Biennial mammography and annual fecal occult blood testing and physical breast exams are probably adequate screening for persons older than age 70 (Yancik & Ries, 2004).

Treatment

Treatment of cancer involves local forms of treatment, such as surgery and radiotherapy, and systemic forms of treatment, including hormonal therapy, cytotoxic chemotherapy, and biological therapy.

Surgery

The risk of surgical mortality and complications increases in persons age 70 and older. In the majority of cases, however, the increased mortality is accounted for by the mortality related to emergency surgery, including obstruction and perforation of the large bowel. Thus, a widespread screening program for cancer of the large bowel may lessen surgical mortality in older individuals. Recent data show that both general anesthesia and cancer-related procedures may be safely performed in people who are 100 years old and older. Radiofrequency ablation (RFA) on small tumors in the liver, lung, and kidney may be used in lieu of surgery.

Radiation therapy

Radiation therapy may provide valid palliation and occasional cure of cancer in persons of all ages. At least three large studies conducted in Italy, France, and the United States showed that patients older than age 70 tolerate doses of radiotherapy comparable to those used in younger individuals, with similar risk of complications.

Radiosurgery is an effective and safe treatment of brain tumors and possibly of tumors less than 5 cm in diameter in other areas of the body.

Cytotoxic chemotherapy

Because aging may be associated with changes in the pharmacokinetics and pharmacodynamics of cytotoxic drugs and with increased susceptibility of normal tissues to the complications of treatment, the dosages of cytotoxic agents may need modification. Pharmacokinetic changes in absorption, volume of distribution, metabolism, and excretion occur with age. With the development of new oral drugs, changes in drug absorption may become more relevant in the use of chemotherapeutic agents. Changes in the volume concentrations of water-soluble agents occur as a result of a decline in lean body water.

A marked decrease in the activity of type I hepatic reactions, involving the P450 cytochrome system, has been reported in frail elderly patients. In addition, these reactions are the main sites of drug interactions, which are particularly likely in older individuals who take several medications each day. Unfortunately, no reliable clinical tests are available to assess these reactions.

Because the decline in glomerular filtration rate (GFR) is one of the most consistent physiological changes in aging, the renal excretion of drugs is reduced in the majority of older individuals. It is prudent to use caution with drugs excreted though the kidneys (e.g., methotrexate, bleomycin, and carboplatin) or drugs that give origin to active and toxic metabolites excreted through the kidneys. Idarubicin and daunorubicin are metabolized to idarubicinol and daunorubicinol, respectively. These alcohols are largely responsible for the activity of the drugs and are excreted through the kidneys. Cytarabine in high doses leads to accumulation in the circulation of ara-uridine, a neurotoxic metabolite eliminated mainly through the kidneys.

In addition to the pharmacokinetic changes that occur with age, pharmacodynamic changes such as altered intracellular metabolism of drugs and decreased ability to repair DNA occur. With age, the toxicity of normal tissues is altered, and the risk and severity of myelodepression, mucositis, central and peripheral neurotoxicity, and cardiotoxicity also appear to increase.

Measures that may mitigate the toxicity of antineoplastic chemotherapy in older persons include adjusting the dose of chemotherapy to the patient's GFR, maintaining the hemoglobin levels greater than or equal to 12 g/dL, and using myelopoietic growth factors (i.e., filgrastim or pegfilgrastim factor) on patients age 65 and older receiving moderately toxic chemotherapy (i.e.,CHOP, or cyclophosphamide, doxorubicin, vincristine, prednisone). Aggressive fluid resuscitation in the presence of mucositis may lower the toxicity of antineoplastic chemotherapy in older people (Balducci et al., 2005).

In addition to drug antidotes, patient selection is extremely important to minimize the complications of chemotherapy. In general, frail patients are not good candidates for aggressive chemotherapy but may receive valuable palliation from drugs with limited toxicity, including gemcitabine, vinorelbine, capecitabine, pemetrexed, and taxanes. Among the less impaired elderly, those dependent in one or more instrumental ADL (IADL) require particularly close attention because they may be at increased risk for chemotherapy-related complications.

Targeted therapy

One of the major advances of cancer treatment in the last 5 years has been the development of agents targeted on specific tumor components or tumor function. In general, these compounds are safer than cytotoxic chemotherapy and better tolerated by older people. Rituximab, a monoclonal antibody to CD20, has improved the therapeutic response and survival of patients with B-cell lymphoma. Radioactive monoclonal antibodies may improve the prognosis of patients with low-grade lymphoma. Trastuzumab, a monoclonal antibody directed to epidermal growth factor receptors, has markedly improved the prognosis of breast cancer; imatinib, an oral inhibitor of tyrosine phosphokinase, has produced the highest number of cytogeneric remissions so far in chronic myeloid leukemia. Other promising agents include the inhibitor of angiogenesis.

Cancer in older persons is an increasingly common problem, and they may benefit from both primary and secondary cancer prevention. Surgical and radiation treatments are generally safe in older individuals. Chemotherapy may be safe and effective in properly selected patients.

LODOVICO BALDUCCI

See also
Health Maintenance
Health Promotion Screening

Internet Resources
National Cancer Institute
http://www.nci.nih.gov

Oncolink
http://www.oncolink.upenn.edu

Women's Cancer Network
http://www.wcn.org/

REFERENCES

Balducci, L., Cohen, H. J., Engstrom, P. F., Ettinger, D. S., Halter, J., Gordon, L. I., et al. (2005). National Comprehensive Cancer Network. Senior Adult Oncology Clinical Practice Guidelines in Oncology. *Journal of the Comprehensive Cancer Network*, *3*(4), 572–590.

Balducci, L., & Ershler, W. B. (2005). Cancer and ageing: A nexus at several levels. *Nature Reviews* (Cancer), *5*(8), 655–662.

Balducci, L., Silliman, R. A., & Diaz, N. (2004). Breast Cancer in the older woman: An oncologic perspective. In L. Balducci, G. H. Lyman, W. B. Ershler, &

M. Extermann (Eds.). *Comprehensive geriatric oncology* (2nd ed., pp. 662–703). New York: Taylor & Francis.

Beghe, C., & Balducci, L. (2005). Biological basis of cancer in the older person. In L. Balducci & M. Extermann (Eds., pp. 189–232), *Cancer treatment and review: Biological basis of geriatric oncology*. New York: Springer.

Campisi, J. (2004). Proliferative senescence and cancer. In L. Balducci, G. H. Lyman, W. B. Ershler, & M. Extermann (Eds.), *Comprehensive geriatric oncology* (2nd ed., pp. 127–137). New York: Taylor & Francis.

Yancik, R,. & Ries, L. (2004). Cancer in older persons: Magnitude of the problem and efforts to advance the aging/cancer research interface. In L. Balducci, G. H. Lyman, W. B. Ershler, & M. Extermann (Eds.), *Comprehensive geriatric oncology* (2nd ed., pp. 38–46). New York: Taylor & Francis.

CARDIOVASCULAR FITNESS

See
Deconditioning Prevention
Exercise and Cardiovascular Response

CARDIOVASCULAR SYSTEM: OVERVIEW

The cardiovascular system includes all of the blood vessels throughout the body and the heart, which provides the force necessary to move blood through the system. The effects of aging on this system are often confused with diseases and the effects of inactivity or *deconditioning*. Diseases of the cardiovascular system are the leading cause of death throughout the nation: it is estimated that 40% of individuals over the age of 65 die of heart disease, and 15% of deaths in the aged are attributed to strokes. Both represent malfunctions within the cardiovascular system. Intense effort is focused on understanding cardiovascular diseases in an attempt to control illness and to preserve functioning of individuals until late in life.

Components of the Cardiovascular System

Arteries are relatively thick-walled tubes that carry blood away from the heart. A branching network of vessels carries blood to tissues throughout the body where the arteries terminate in extremely small vessels called capillaries. The *capillaries* are microscopic in size, barely large enough for the passage of one blood cell at a time. Their walls are extremely thin, permitting transfer of nutrients and waste products between the blood within the capillary and surrounding tissues. The capillaries eventually join together and terminate in larger vessels called veins, which collect the blood and return it to the heart. *Veins* are relatively thin-walled when compared with arteries but still contain muscle cells within their walls that permit contraction and expansion of the vessel size. As will be seen later, this contributes to the body's ability to adjust the system capacity as needed. The purpose of the *circulation system* is to permit the collection of nutrients from ingested food and body stores and transport them to tissues in need of sustenance. By-products of the energy production process are carried away by the blood and discarded through the lungs and kidneys. *Body temperature* is preserved through heat retention or radiation, by diverting blood to surface areas of extremities where heat is lost or by retaining blood circulation within the body core, thus preserving heat.

The heart provides *blood movement*. This organ represents 2 pumps in a single package. Each pump has 2 chambers: an atrium and a ventricle, each of which contributes to pump performance. The right side of the heart receives blood returning from body tissues and forwards it to the lungs at a low pressure. In the lungs, oxygen is received and carbon dioxide eliminated. Blood returns from the lungs to the left side of the heart where it is sent throughout the body at a relatively high pressure. Hormones secreted into the blood stream are moved to target organs where they induce various reactions. Nutrients from the intestine are transported to the liver for processing and then to body stores or tissues for metabolism. Wastes are moved to the kidneys and discarded in urine. Heat generated in this process is dissipated through the passage of warm blood through skin in the extremities where radiation or sweat evaporation provides needed cooling. All this is accomplished involuntarily.

The regulation of this remarkable system is exceedingly complex. Constant adjustments are being made to compensate for changes in workload, alterations in position, changing thermal demands, shifts in emotions, dietary intake, or trauma. The result of regulation is a precisely metered flow to vital organs in response to their need. Sensors detect changes in flow, pressure, temperature, metabolic components, and fluid composition, which are then balanced through system adjustments. Variations in heart rate and muscle tone in artery and vein walls and variable fluid reabsorption and excretion of blood components permit a careful balance of the system in the face of repeated environmental challenges. Even in the face of extreme conditions, a remarkable degree of balance is achieved.

Normal Aging

With the passage of time, elastin within the arterial walls changes somewhat. It becomes less resilient and somewhat elongated. Calcium deposition may occur where none was previously evident. The result is a loss of elasticity and slight elongation of arteries resulting in tortuosity. Heart valves become less flexible. Some circulation shifts occur in blood flow as tissues decline in function. Kidney flow is substantially reduced. However, flow to the head and heart remains virtually constant throughout life. A rise in blood pressure occurs in part due to loss of arterial elasticity with resultant failure to absorb the peak pressure generated by each heartbeat. Instead, the pulse is transmitted throughout the system as a rapid high pressure wave.

Heart changes with age are modest. A slight increase in the size of the heart muscle is attributed partly to higher arterial pressures. Loss of valve flexibility causes blood turbulence with subsequent creation of murmurs. The maximum *heart rate declines with age*, yielding loss of some reserve. This is compensated in part by a dilation of the heart with exercise, allowing more blood to enter the heart and a higher percentage of blood ejection per beat, resulting in little loss of performance throughout life. In the absence of disease, cardiovascular performance is capable of remaining excellent throughout life.

Cardiovascular Diseases

Atherosclerosis is the major problem affecting the cardiovascular system. Atheromatous plaques, which progressively restrict flow, develop within the interior lining of arteries. The plaques are composed of inflammatory cells, muscle cells, fat, and calcium. Initially evident as small streaks of yellow discoloration within arterial walls seen in early life, the problem progresses until large areas of arterial wall are covered with thickened plaques in later years.

The cause of atherosclerosis is not fully understood. Age and genetic background are important. Males are more prone to the disease than females. Smoking substantially escalates atheromatous change, as does uncontrolled hypertension. Persons suffering from blood lipid abnormalities, diabetes, and obesity are known to suffer increased disease frequency. *Personality factors* (*Type A*) also have been thought to be associated with accelerated atheromatous degeneration.

Vessel narrowing effectively reduces flow capacity. Initially, no effect is evident because the flow rate may still equal peak demand. Later, in stress situations, flow will be inadequate and symptoms develop. Late in the disease, symptoms will be evident at rest. Common clinical syndromes associated with atherosclerosis include leg pain when walking, the result of inadequate nutrient flow to leg muscles. Surgery can sometimes reopen narrowed vessels. On occasion, vessel replacement with grafts taken from elsewhere in the body or the use of synthetic materials may be necessary. When heart vessels are narrowed, chest pain (angina pectoris) may occur on exertion. Brief episodes of thinking problems, paralysis, or sensory disorders may be evident when *brain circulation* is compromised. When blood clots form at the site of narrowing, complete block of the artery can occur. Occasionally, small clots will form on the surface of plaques and break free to drift downstream (emboli). As the arterial system narrows, these clots will lodge and block circulation. A toe may suddenly turn blue. Occasionally, a foot or leg may be deprived of circulation by such events. When blockage occurs in arteries supplying the heart, a *heart attack* (*myocardial infarction*) will occur. *Blockage in brain circulation* results in a *stroke* (cerebral infarction). Medications can sometimes reestablish flow. Often there is no alternative but to await spontaneous recovery or development of alternative circulation routes around the blocked artery.

Aneurysms represent a weakness within arterial walls with subsequent bulging. Aging, hypertension, and a small number of inherited diseases have been associated with this condition. As a result of such events, the artery wall becomes stretched beyond its usual dimensions and is subject to rupture, commonly resulting in death. In its mildest form, no treatment is necessary. If life-threatening enlargement occurs, surgical replacement of the vessel using a synthetic graft is possible.

Venous diseases are fairly common among elderly persons. *Varicosities* (dilated and tortuous veins) are caused by nonfunctioning valves that normally direct blood flow back toward the heart. Genetic causes are usually suspected as the underlying problem. In many situations, varicose veins present purely cosmetic difficulties, and no treatment is required. If moderate or severely tortuous veins are present, skin deterioration and ulcer formation can occur. *Elastic support stockings* are extremely helpful in promoting normal blood return to the heart. Sometimes surgical removal of veins is helpful.

Phlebitis or *thrombophlebitis* is a term used to describe the formation of clots within veins, which subsequently become inflamed. Causes include *coagulation disorders* within the circulating blood system, local trauma, or inactivity. Failure to move extremities for prolonged periods results in sluggish blood flow and can promote clotting. Veins involved in clotting may become tender and firm to the touch, making diagnosis easy. Sometimes veins deep within the legs, arms, or pelvis will become clotted. Symptoms tend to be nonspecific, such as swelling of an extremity or mild fever. The diagnosis can be established with contrast *venography* or color *doppler sonography*. Prevention involves regular physical activity to promote normal circulation, and avoiding long episodes of sitting in a chair or lying without motion. Elastic support hose will improve venous return and minimize chances of coagulation. Individuals placed at bed rest may require anticoagulants to reduce the chance of phlebitis formation.

Pulmonary emboli can occur when *deep venous thrombosis* (DVT) subsequently breaks free and drifts back to the lung (embolization) after passing through the right side of the heart. Small clots cause little problem, as ample reserve circulation exists to bypass blocked lung vessels. If large numbers of clots break free or a single large clot enters the lung circulation, life-threatening blockage can result. The body is capable of dissolving clots and reestablishing circulation, provided serious flow disruption does not occur. Diagnosis of this condition can be exceedingly difficult because symptoms are vague and nonspecific. Anticoagulants are sometimes effective in reducing clot formation and subsequent *embolization* during the healing process.

Heart valves can be damaged by a variety of mechanisms resulting in *heart murmurs*, which are due to turbulent blood flow across a valve. Flow can be blocked by failure of the valve to properly open. Valve leakage with blood backflow is possible when leaflets fail to properly seal. *Valve replacement* may be required to reestablish normal flow patterns through the heart. Valve damage can also occur when bacteria lodge on their surface, resulting in local destruction and valve dysfunction (*bacterial endocarditis*). Bacteria cast into the bloodstream from valve infections can spread throughout the body and present a host of confusing symptoms for the diagnostician. This condition requires intensive antibiotic therapy, and often replacement with a synthetic valve is necessary. For this reason anyone with a heart murmur should be considered for antibiotic therapy during diagnostic and surgical procedures associated with transient bacteria in the bloodstream, such as dental procedures and colonoscopy. Individuals with synthetic valves are at particular risk for developing bacterial endocarditis.

Angina pectoris occurs when arterial narrowing prevents satisfactory flow to heart muscle. The patient experiences chest pain or pressure, which spreads to the arms or jaw, commonly on the left side. Symptoms may be more vague in older adults, such as extreme fatigue or shortness of breath. Exercise aggravates the pain, and rest relieves it. Medications that limit cardiac response to exercise or alter blood circulation flow throughout the body can relieve symptoms. No heart muscle damage occurs, and each symptom episode is usually short-lived.

Myocardial infarction, commonly know as heart attack, is a more serious manifestation of arterial narrowing that results in heart muscle death, when an atherosclerotic plaque ruptures and a clot forms. At the time of muscle injury, some individuals may be totally unaware that a problem exists. Diabetics are particularly susceptible to such silent events owing to changes in their nervous system. Some individuals may suspect they are suffering "heartburn." Many elderly persons will manifest confusion, stomach upset, or weakness as their only symptoms. When severe, crushing, and prolonged chest pain occurs associated with nausea, myocardial infarction is extremely likely. An *electrocardiogram* and measurement of enzymes within the bloodstream can provide definitive evidence of muscle damage. Treatment may involve *thrombolytic agents* to dissolve the clot or emergent revascularization with *balloon angioplasty* and stent placement or *coronary artery bypass graph surgery*. Early mobilization rather than bed rest is now advocated following myocardial infarction. This does not interfere with healing and helps to prevent orthostatic symptoms, thromboembolic complications, and musculoskeletal deconditioning. An outpatient *cardiac rehabilitation program* is generally recommended. Repeated infarction results in replacement of heart muscle with fibrous tissue and subsequent severe performance limitations.

Congestive heart failure is a syndrome characterized by cough, shortness of breath, and poor exercise tolerance. Sluggish flow through the lungs leads to fluid accumulation, with a characteristic cough and change in breath sounds heard through a stethoscope. Fluid may accumulate in feet and legs, giving a swollen, bloated appearance. Occasionally fluid accumulation can progress to include the torso and body organs. Poor exercise tolerance is an inevitable result of decreased pumping ability of heart muscle. There are many causes of congestive heart failure. Atherosclerotic heart disease and myocardial infarction can damage the heart muscle, leading to dilation of the heart and decreased pumping ability. Untreated hypertension can lead to a thickening of the heart muscle, which compromises the ability of the heart to fill with blood, again limiting the pumping ability. It is estimated that 30% of individuals aged 90 have suffered deposits of a material called *amyloid* within heart muscle, which reduces performance substantially; these deposits are especially common in the presence of chronic diseases such as *rheumatoid arthritis*. Viral illness can also sometimes seriously deteriorate heart muscle performance. *Heart muscle disease* of all types reduces pump performance, causing symptoms of congestive heart failure. Another common cause of congestive heart failure is a particular arrhythmia called *atrial fibrillation*, in which the pumping ability of the atria is lost and the heart functions with contraction of only the ventricles. Treatment of congestive heart failure includes fluid elimination by means of *diuretics*. Blood pressure and arterial resistance may be altered with a variety of new medications that have yielded outstanding symptom control. In the most serious cases of congestive heart failure, *heart transplantation* may be necessary.

Arrhythmia (*irregular heartbeat*) is an exceedingly common problem in older persons. The normal smooth sequential spread of electric activity throughout the heart chambers activating muscle contraction is interrupted. Absence of initiation of the beat, blockage of normal spread, and premature initiation in remote heart areas represent the most common malfunctions encountered. Failure to initiate the heartbeat within the normal sites found in the atrium can be compensated by initiation of the heartbeat elsewhere within the system, albeit at a reduced rate. Insertion of artificial pacemakers can often return the heart to its former level of performance. Blockage of normal beats as electric transmission through the muscle can likewise be offset by artificial pacemakers activating muscle beyond the block. Of much greater concern is initiation of rapid, uncoordinated beats or sudden absence of heart beat, which commonly occur at the moment of myocardial infarction. For this reason, persons are placed on electronic monitoring equipment in coronary care units for a period of 2 or 3 days following a heart attack. Stability of heart rate over a period of 48 hours is associated with relatively few complications and monitoring can be discontinued.

Orthostasis represents a loss of ability to quickly adjust blood pressure to changes in position. Most individuals have experienced episodes of light-headedness when quickly arising from a reclining or sitting position. Older adults are particularly affected by this condition as arterial flexibility and changes in the nervous system reduce their ability to quickly raise blood pressure in response to position changes. Avoiding diuretics and use of support hose can reduce symptoms in some individuals. Others are obliged to change position extremely slowly to avoid losing consciousness.

Syncope (*fainting*) is the result of a transient *blood pressure loss*. A frightening appearance is presented to the onlooker when an individual suddenly falls to the ground unconscious: the countenance is extremely pale, and blood pressure and pulse may be unobtainable. Usually spontaneous recovery begins immediately upon falling to the ground, and within a short period the person regains consciousness and improves in appearance. An evaluation is usually necessary to determine the cause, such as cardiac arrhythmia, blood loss, acute illness, stroke, or seizure. Frequently, no specific cause can be found, and it is attributed to orthostasis or nervous system dysfunction of unknown origin. At the first sign of *dizziness*, one should sit or recline to avoid total loss of consciousness. Regular meals and frequent position changes are thought to reduce the occurrence of this relatively common problem.

Shock is a term used to describe *loss of blood pressure* due to serious vessel damage. Unlike syncope, which is transient and benign, shock is life threatening. *Blood loss* is a common cause of this condition. In older persons, bleeding from an intestinal ulcer, diverticulitis, or angiodysplasia within the gait may be contributing factors. *Anticoagulation* can contribute to blood loss that may initially be hidden within body cavities, making diagnosis difficult. Immediate blood replacement is essential to bring blood pressure back to normal. Serious infections can cause loss of blood pressure due to the effects of bacterial toxin on capillary walls. Fluid loss correlates with a dramatic drop in circulating blood volume and subsequent pressure reduction. Intensive antibiotic therapy coupled with fluid replacement is essential. Shock invariably requires intensive care, which is often delivered in specialized hospital units with automated monitoring equipment.

Hypertension is a particularly widespread problem in older persons. Although diastolic blood pressure levels off after age 60, the *degeneration of elastin* results in gradually increasing systolic blood pressure throughout later life. Elevated pressures increase the risk for stroke, atherosclerotic heart disease, heart failure, kidney disease, aortic dissection, aortic aneurysm rupture, and retinal damage with loss of vision. Thus, maintenance of pressures below a level of 140-160/90 is desirable, with avoidance of orthostatic hypotension and maintenance of renal function. Weight loss, reduction of dietary salt intake, and modest exercise may lower blood pressure and avoid the need for medication. Diuretics are commonly employed to reduce vascular volume. Numerous agents are available to alter arterial and venous muscle tone with subsequent pressure reduction. Flexibility and caution are required when approaching hypertension therapy in older adults, due to the potential side effects of the medications.

Deconditioning of the cardiovascular system is thought to be a prevalent condition among older adults. Loss of heart muscle strength and vessel responsiveness to central nervous system control is thought to result from inactivity. Data to support such a theory has begun to emerge from studies of astronauts experiencing prolonged weightlessness in space. Exercise protocols are now routine for space flights and have reversed the terrible debilitation documented in early exploration efforts. Exercise programs tailored to the needs of older adults may prevent deterioration in muscle strength and cardiovascular performance as well. This is currently an area of intense research.

Diagnosis

Numerous diagnostic methods are involved in determining cardiovascular diseases. Most important among them are a careful history and physical examination with measurement of blood pressure and heart rate, and with auscultation of cardiac sounds using the stethoscope. Electric activity of the heart can be documented by means of the *electrocardiogram*. Additional information is obtained when electric activity is checked during an *exercise stress test*, such as a *treadmill* or *bicycle ergometer* evaluation. X-rays can determine abnormal cardiac configuration, and sound waves can be bounced from interior chambers to assess architectural variations (*echocardiogram*). Radioactive material injected within the bloodstream permits painless assessment of heart performance at rest and exercise. Dye injected within the heart by means of a catheter passed through the arterial system can determine valve damage, cardiac chamber abnormalities, and cardiac circulation difficulties (*cardiac catheterization*, *cardiac angiogram*). Additional cardiac assessment tools are under development, which will further our understanding of performance of this critical system.

Health Promotion and Disease Prevention

A number of steps are possible to encourage optimal performance of the cardiovascular system. Smoking should be avoided because it promotes atherosclerosis and is associated with myocardial infarction. Blood pressure regulation in hypertension will also retard atheroma formation and reduce the occurrence of strokes. Careful regulation of sugar levels in diabetes is also valuable in retarding cardiovascular problems. For those with elevated blood cholesterol level and in particular elevated LDL cholesterol level, a diet low in fat can help reduce the risk of cardiovascular disease. Medication may be necessary to meet recommended levels of LDL cholesterol. *Regular exercise*, even of moderate intensity such as walking, performed 5 to 6 times per week has been proposed as important for maintenance of cardiovascular system performance. Maintenance of an ideal weight by control of sugar and fat intake may promote health through its effects on blood pressure and cholesterol blood level. Taken together, such elements comprise a "*healthy lifestyle*" promoting *cardiovascular health.*

For additional research and its clinical implications, see the following references: Cassel, Cohen, Larson, Meir, & Capello, 1997; Friesinger, 1999; Hazzard, Blass, Ettinger, Halter, & Ouslander, 1999.

HEIDI K. WHITE
ROBERT J. SULLIVAN JR.

See also
Cardiovascular System: Heart
Cardiovascular System: Vasculature

REFERENCES

Cassel, C. K., Leipzig R. M., Cohen, H. J., Larson, E. B., Meier, D. E., & Capello, C. F. (Eds.) (2003). *Geriatric medicine* (4th ed.). New York: Springer Publishing.

Friesinger, G. C. (Ed.) (1999). *Cardiology clinics: Cardiovascular disease in the elderly*. Philadelphia: W. B. Saunders.

Hazzard, W. R., Blass, J. P., Ettinger, W. H., Halter, J. B., & Ouslander J. G. (Eds.) (2003). *Principles of geriatric medicine and gerontology* (5th ed.). New York: McGraw-Hill.

CAREGIVER BURDEN

Of the adult (i.e., 18 or older) U.S. population, 21%, more than 44 million, provide unpaid care to adult relatives and friends. Most of them are middle-aged women who are spouses and daughters. Some caregivers report positive outcomes from the caregiving experience (Picot, Debanne, Namazi, & Wykle, 1997), but many more report negative perceptions and consequences (Pinquart & Sorensen, 2003), which are termed *caregiver burden.*

Caregiver burden can describe tasks performed by caregivers to compensate for elders' functional and behavioral deficits but also includes the tension, stress, strain, upset, costs, and frustrations that caregivers feel in response to these deficits. Most commonly, caregiver burden is defined as the extent to which caregivers perceive that caregiving has had an adverse effect on their emotional, social, financial, physical, and spiritual functioning (Picot et al., 1997). This definition is used herein, with the addition of the adverse consequence of spiritual distress.

Caregivers who are experiencing caregiver burden often do not seek assistance for themselves while accompanying elders during health care visits. Caregivers report that health care providers rarely inquire about their health status and concerns, and when they do articulate the negative effects of caregiving, health providers may not recognize their needs. Thus, informal caregivers are often referred to as the hidden or secondary patients.

Identifying vulnerability to caregiver burden is difficult because each caregiver is different. Pearlin, Mullan, Semple, and Skaff's (1990) conceptual model of caregiver stress suggests that practitioners assess for the (1) background or context of stress, (2) primary and secondary stressors, (3) mediators of stress, and (4) outcomes of stress to determine whether caregiver burden is an issue.

Background factors to assess include race, ethnicity, socioeconomic status, gender, age, relationship of caregiver to elder, past relationship quality, and community resources. Race is a socially constructed group with a shared history and political status, possibly affecting the caregiver's access to resources. Ethnicity is a more comprehensive term that describes persons with shared national heritage and culture. Assessment of the cultural meaning of caregiving is important because culture influences the selection of caregivers, demands of caregiving, acknowledgment, appraisal and coping responses to problems, outcomes of the caregiving process, and acceptable interventions (Knight, Silverstein, McCallum, & Fox, 2000). However, it is important to acknowledge that despite commonalities among caregivers in an ethnic group, there is still also heterogeneity.

Primary stressors originate from the functional and behavioral deficits of the elderly person. Particular attention must be given to the number, duration, frequency, and unrelenting nature of care demands. Care demands can be quickly assessed using a standard measure of the care recipient's physical and instrumental activities of daily living (IADL), such as *Multidimensional functional assessment of older adults: The Duke OARS procedures* (Fillenbaum, 1988) and resistance to the caregiver's help. Behavioral Problem Checklists can be used to assess the range of behavioral problems exhibited by dementia and nondementia patients living in private homes and the corresponding responses of caregivers (Picot, 1995).

Although almost all caregivers are less healthy than noncaregivers, caregivers of elders with dementia are especially vulnerable (Pinquart & Sorensen, 2003). They display higher stress and depression levels and lower self-efficacy and general subjective well-being levels than noncaregivers. Other vulnerable caregivers include those whose loved ones have illnesses associated with stigma (e.g., AIDS, cancer, dementia, and mental illness).

Secondary stressors consist of role and intrapsychic strains. Role strains often arise from conflict about the care management of the elder within the context of the family, including employment and financial aspects. As care demands increase, health professionals must assess the extent of the caregiver's social and recreational activities. Social isolation accentuates both caregiver burden and depression, placing the elder and caregiver at risk for elder abuse and mistreatment. Intrapsychic strains include lowered self-esteem and perceptions of competence and gain. Caregivers who have competing roles (e.g., employee, parent, wife); who are young, female, and White; and who have low self-esteem and sense of mastery and little knowledge of the condition contributing to the elder's disability appear to be most at risk for caregiver burden resulting from secondary stressors.

Mediators of stress outcomes include coping and social support. The coping measure suggested by Pearlin et al. (1990) offers strategies related to the management of stress, the meaning of the caregiving situation, and the resulting symptoms of stress. In assessing social support, it is crucial to avoid assuming that the availability or size of a social support network translates into the absence of burden. Depending on the effectiveness of coping strategies and social support quality, caregivers may experience varying effects on their health outcomes.

Global assessment of the caregiver's self-perceived health—physical, mental, social, and spiritual—can be assessed with the Caregiver Strain Index. As caregiving demands change, health care professionals should periodically reassess the caregiver's health status. Global assessment of the self-perceived health of caregivers in comparison to their peers is important, as well as attention to chronic-stress indicators, such as increasing salivary cortisol, blood pressure, blood glucose, and compromised immune system responses; and increased doctor visits, medication use, and substance abuse. Measures that include symptoms of specific organ systems (e.g., respiratory and cardiovascular), such as the Cornell Medical Index, help the practitioner target specific areas for monitoring and intervention.

Mental health evaluations should include symptoms of stress. Those lasting at least 2 weeks—for example, low or irritable mood; feelings of worthlessness, self-reproach, or excessive guilt; suicidal thinking or attempts; motor retardation, agitation, or disturbed sleep; fatigue and loss of energy; loss of interest or pleasure in usual activities; difficulty focusing; and changes in appetite or weight—may suggest depression. The most commonly used community measure of depression is The Center for Epidemiologic Studies Depression Scale.

The social health of the caregiver can be evaluated by listing who is both available and reliable in the caregiver's social support network to provide respite, empathic listening, help with care tasks, or accessing resources (Pearlin et al., 1990). Spiritual health often helps buffer the development of other adverse health consequences for caregivers. Spiritual distress can occur when caregivers are homebound or the caregiving situation and the elder's suffering challenge their beliefs (Picot et al., 1997). Queries about caregivers' ability to attend religious services, receive visits from fellow worshippers in the home, read or hear religious messages, and questions about the importance of religion in their life can help gauge the spiritual health of caregivers. Declines in caregiver health may affect quality of life (QOL) for both caregiver and elder.

Cross-cultural measures such as the World Health Organization QOL – Brief Instrument are useful to assess these changes. Finally, because caregivers vary in characteristics and settings, the Family Caregiver Alliance has published a compendium of selected caregiver assessment measures (Family Caregiver Alliance, 2002).

Day-to-day strategies to lessen caregiver stress and caregiver burden include acquiring knowledge and skills to manage the elder's problems and balancing caregiving with other roles and health promotion needs (Teel & Leenerts, 2005). To maintain their own health, caregivers may need assistance in identifying and coordinating acceptable family and professional helpers and in planning for anticipated changes, including transferring care of the elder to others. Caregivers may also need support or counseling to accept that transferring care responsibilities can have positive consequences for both the caregiver and the elder. Psychosocial interventions (e.g., counseling and problem solving) have been shown to promote effectively healthy changes in caregiver stress, depression, and self-efficacy levels.

Health care professionals must be empathic listeners as they conduct a careful assessment of caregivers' backgrounds, stressors, mediators, and outcomes. Effective strategies to avoid or minimize caregiver burden should be planned with the caregiver and should be responsive to each caregiver's unique situation.

SANDRA J. FULTON PICOT
JUHEE LEE

See also

Family Caregiver Needs: Assessment
Caregiver Burnout
Caregiving Relationships
Cultural Competence and Aging

Internet Resources

American Association of Retired Persons: Health and Wellness and Explore Health
http://www.aarp.org/indexes/health.html#caregiving

Family Caregiver Alliance: National Center on Caregiving
http://www.caregiver.org/caregiver/jsp/home.jsp

Guide to Internet Resources Related to Aging
http://www.aarp.org/cyber/sd13.htm#top

National Caregiver Support Program
http://www.aoa.gov/prof/aoaprog/caregiver/caregiver.asp

National Family Caregivers' Association
http://www.nfcacares.org

Powerful Tools for Caregivers Online
http://www.matherlifeways.com

REFERENCES

Family Caregiver Alliance (2002). *Selected caregiver assessment measures: A resource inventory for practitioners*. San Francisco, CA: National Center on Caregiving.

Fillenbaum, G. G. (1988). *Multidimensional functional assessment of older adults: The Duke Older Americans resources and services procedures*. Mahwah, NJ: Lawrence Erlbaum & Associates.

Knight, B. G., Silverstein, M., McCallum, T. J., & Fox, L. S. (2000). A sociocultural stress and coping model for mental health outcomes among African American caregivers in Southern California. *Journal of Gerontology: Psychological Sciences*, *55B*(3), 142–150.

Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: An overview of concepts and their measures. *The Gerontologist*, *30*, 583–594.

Picot, S. J. (1995). Rewards, costs, and coping of African American caregivers. *Nursing Research*, *44*(3), 147–152.

Picot, S. J., Debanne, S. M., Namazi, K. H., & Wykle, M. L. (1997). Religiosity and perceived rewards of Black and White caregivers. *The Gerontologist*, *37*(1), 89–101.

Pinquart, M., & Sorensen, S. (2003). Differences between caregivers and noncaregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging*, *18*(2), 250–267.

Teel, C. S., & Leenerts, M. H. (2005). Developing and testing a self-care intervention for older adults in caregiving roles. *Nursing Research*, *54*(3), 193–201.

CAREGIVER BURNOUT

Burnout has been described as a syndrome of physical, mental, and emotional exhaustion resulting from the stress of frequent, deep, intensive involvement with people over a long period (Maslach, 1982). Burnout can be observed from individuals who work with other people such as teachers, police officers, social workers, mental health workers, health care professionals, and informal caregivers. Informal caregivers who have close contact with a disabled or elderly person are at high risk of burnout (Almberg, Grafstrom, & Winblad, 1997a). Isolated, frustrated, and exhausted, housebound informal caregivers receive little respite from the demands of their responsibilities and cannot leave their problem at work unlike people employed by an organization (Hubbell & Hubbell, 2002).

Burnout is related to the situation in which an individual provides disproportionally high efforts of time, emotional involvement, and empathy but yet perceives highly demanded working conditions with poor satisfaction (Iacovides, Fountoulakis, Kaprinis, & Kaprinis, 2003). Among professional caregivers, burnout syndrome is related to a loss of idealism, decreased commitment to helping those in need, emotional detachment from and negative attitudes toward patients, feelings of powerlessness over the conditions of their work, and mental and physical exhaustion (Iacovides et al., 2003). Emotional exhaustion of informal caregivers can be related to elderly abuse, limitation in social life, poor health, lack of positive outlook on caring, and increased utilization of emotion-focused coping strategies (i.e., grieving, worrying, and self-accusation) (Almberg et al., 1997a, 1997b; Quayhagen et al., 1997).

Effects of Burnout

Burnout usually occurs after less than 2 years of caregiving (Muldary, 1983). Caregivers experiencing burnout focus more on negative events of the past or negative prospects for the future and narrow their attention to events outside themselves. They give less attention to immediate circumstances and become increasingly preoccupied with internal thoughts. This narrowing attention reduces their ability to process information efficiently and solve problems as they arise. As a result, there may be increased risk of errors in judgment, neglect of caregiving activities, and accidents.

Burnout results from the caregiver's inefficient appraisal of circumstances or lack of adequate coping resources, thus impairing the caregiver's ability to respond to continually changing conditions and demands (Muldary, 1983). Such a caregiver may respond inadequately to the care recipient's needs. According to Maslach (1982), during the phase that leads to burnout, emotional exhaustion emerges first, followed by depersonalization as an attempt to defend himself or herself by isolation of affect, then the individual feels lower personal accomplishment in the working environment. Caregiving becomes just an activity that is performed grudgingly by a demoralized caregiver and only to the extent necessary to avoid serious adverse consequences. Simultaneously, loss of empathy, caring, and respect for care recipients emerges; this is communicated by avoiding eye contact and performing rigidly technical caregiving activities without any other human interactions. Reflected in the language of the caregivers, the dehumanizing attitude makes care recipients seem more like objects, problems, or disease entities than individuals. Dehumanization results in neglect of the care recipient.

Burnout often impairs the control and coping mechanisms used to regulate emotional expression (Muldary, 1983). Thus, burned-out caregivers often express anger and anxiety. Many burned-out caregivers believe that things would be better if they terminated their caregiving activities or used alcohol and drugs. They become unwilling to cooperate with others and tend to spend more time alone.

Predisposing Factors

Although burnout is a highly variable syndrome that cannot be predicted by any single factor, certain people are at more risk for burnout than others. People who have a high degree of empathy for others, are sensitive to the needs of others, have compulsive personalities, and lack self-confidence are more vulnerable to burnout (Muldary, 1983). Individuals with compulsive personalities like to ensure predictability and control in their world; imperfect or unpredictable caregiving situations provoke stress. Individuals who lack self-confidence or are submissive tend to subordinate their own needs to those of others. Such persons are unlikely to say no; they avoid making personal demands to keep from displeasing others and must feel that they are needed and appreciated (Muldary, 1983). Thus, when positive outcomes are not readily apparent—as is often the case in long-term caregiving situations—emotional stress accumulates over time and leads to burnout.

Interventions

Individual coping strategies

The basic principle in managing burnout is to encourage individuals to do whatever they can to change a given situation or to train them to cope more effectively when it is not possible to change it (Muldary, 1983). Caregivers need to be aware of the physical and psychological signals of chronic stress and their responses to it by consciously monitoring themselves.

Caregivers with burnout more often used emotion-focused than problem-focused coping strategies (Almberg et al., 1997b). Emotion-focused coping strategies are used by family caregivers to make themselves feel better without changing the source of stress. The most common emotion-focused strategy is overconsumption of alcohol and use of mood-altering substances. However, these strategies have only short-term effects. In other cases, caregivers attempt to detach themselves from the caring situation but because of their familial relationship, distancing may be difficult. Relaxation techniques such as tension relaxation, letting go, sensory awareness, and yoga are useful emotion-focused coping activities for reducing muscle tension and achieving a feeling of well-being.

Problem-focused strategies are efforts to master stressful situations. Individuals may go directly to the source of stress and seek to change it through interpersonal communication. Family caregivers can be trained to communicate more effectively and use functional coping strategies in the therapeutic environment. A change in perspective might also be required in managing burnout. Some caregivers believe that they are entirely responsible for their care recipient's well-being; others feel that what they do does not make any difference in the situation. Direct action for personal change involves learning how to do some things differently.

Family therapy

When working with families of burned-out caregivers, a focus on context, relationship, and meaning can be helpful. Many family therapists attend to the structure and process of the family's interaction with the environment, the intergenerational family system, and the current family system.

The focus on the family-environment interface attempts to alter the environment. Family members need to look at their resources and draw on the strengths of their relationships. This may help family members make better use of conditions in their environment and gain control and power in their lives. The focus on the intergenerational family system stems from the belief that people and their current families are shaped in major ways by powerful intergenerational forces.

The third focus is on the current family system—its structure, communication, and organization. The therapist tries to create a context in which family members gain a different perspective of themselves and their world. The therapist has to be personally authentic and connected while trying to influence the family's transactional patterns. By giving attention to the needs, feelings, and words of every member of the family, the family therapist may help establish a relationship that can change the burnout environment (Catherall, 1999).

Support groups

Caregivers who are isolated from relatives and friends are more likely to experience burnout. Support groups for caregivers help caregivers by providing time and place for sharing their feelings of isolation and frustration of caregiving. Many people find solace in sharing feelings and seeking emotional support from others who understand firsthand the challenges of caregiving. Choosing a support group that is suitable for an individual caregiver is a difficult task. However, many agencies and institutes, such as Children of Aging Parents, Family Caregiver Alliance, Family Voices, Inc., Friends' Health Connection, and Well Spouse Foundation, provide helpful information on the support groups for caregivers.

Caregiver's Bill of Rights

Health professionals can help family caregivers manage burnout by enhancing their coping strategies, providing family therapy, and acknowledging caregivers' rights and responsibilities. According to the "Caregiver's Bill of Rights," caregivers have the right to seek information about providing better caregiving activities, as well as protecting their own health, spirits, and relationships. The bill of rights empowers family caregivers to pursue better caregiving environments with the help and support from other family members and health professionals. It also enables them to find alternatives if home caregiving is no longer physically, financially, or emotionally feasible. Advocating caregivers' rights allows family caregivers to ask for outside help that mitigates burnout and encourages effective caregiving.

Caregivers need to recognize their own needs, such as adequate information about the nature of the care receiver's condition; coping skills; assistance with psychological, financial, and medical services; emotional support; and long-term planning. Health care professionals also need to collaborate with caregivers' families to elicit their expertise, resources, and strengths.

Haejung Lee
Rhayun Song
Heajong Shin

See also

Caregiver Burden
Caregiver Support Groups
Caregiving Benefits
Caregiving Relationships
Elder Mistreatment: Overview
Elder Neglect
Support Groups

Internet Resources

The Caregiver's Handbook
http://www.medsupport.org/caregiverguide.htm

Caregiver Survival Resources
http://www.caregiver911.com

Family Caregiver Alliance
http://www.caregiver.org

National Family Caregivers' Association
http://www.nfcacares.org

REFERENCES

Almberg, B., Grafstrom, M., & Winblad, B. (1997a). Caring for a demented elderly burden and burnout among caregiving relatives. *Journal of Advanced Nursing*, *25*, 109–116.

Almberg, B., Grafstrom, M., & Winblad, B. (1997b). Major strain and coping strategies as reported by family members who care for aged demented relatives. *Journal of Advanced Nursing*, *26*, 683–691.

Catherall, D. (1999). Treating traumatized families. In C. Figley (Ed.), *Burnout in families: The systemic costs of caring*. Boca Raton, FL: CRC Press.

Hubbell, L., & Hubbell, K. (2002). The burnout risk for male caregivers in providing care to spouses afflicted with Alzheimer's disease. *Journal of Health and Human Services Administration*, *25*, 115–132.

Iacovides, A., Fountoulakis, K. N., Kaprinis, S., & Kaprinis, G. (2003). The relationship between job stress, burnout, and clinical depression. *Journal of Affective Disorders*, *75*, 209–221.

Maslach, C. (1982). *Burnout: The cost of caring* (pp. 3–148). Englewood Cliffs, NJ: Prentice-Hall.

Muldary, T. W. (1983). *Burnout and health professionals: Manifestations and management*. Stanford, CT: Appleton-Century-Crofts.

Quayhagen, M., Quayhagen, M. P., Patterson, T. L., Irwin, M., Hauger, R. L., & Grant, I. (1997). Coping with dementia: Family caregiver burnout and abuse. *Journal of Mental Health & Aging*, *3*, 357–364.

CAREGIVER SUPPORT GROUPS

Caregiver support groups are an important source of information, guidance, and peer support for adults who provide assistance to frail or disabled elderly relatives or friends. Support groups provide social support and emotional reassurance, education about diseases and disability, proven strategies for coping with the physical and emotional demands of providing elder care, and information about community services for older adults and their caregivers. Support groups are one of the basic services authorized under the National Family Caregiver Support Program (NFCSP), established in 2001 as Title III-E of the reauthorized Older Americans Act. Caregiver support groups typically are provided by or in collaboration with nonprofit organizations or social service agencies that serve older adults and their families. They can be led by peers, paraprofessionals, or professionals such as social workers or psychologists, depending on the goals and structure of the group.

A recent household survey of caregivers (Scharlach, et al., 2003) found that 10% of caregivers had participated in support groups in the previous year. Support-group participation is more likely among caregivers who are older, more highly educated, have higher incomes, and provide assistance to care recipients with greater physical or cognitive disabilities.

Support groups for caregivers can be divided into two major types: (1) mutual support groups, and (2) psycho-educational groups, although most groups combine aspects of both types (Toseland & Smith, 2001).

Mutual-Support Groups

Mutual-support groups provide a supportive and understanding context within which caregivers can discuss common concerns about providing assistance to an impaired family member or friend. The primary focus is on development of a social support network within which participants can give and receive emotional support, exchange proven strategies for managing elder care, and share concrete information about community resources (Sorensen, Pinquart, & Duberstein, 2002; Toseland & Smith, 2001). Mutual-support groups tend to have less structure than psycho-educational groups: content typically is determined on an ad hoc basis at each group meeting; leaders may be peers or paraprofessionals; membership often is flexible, with participants attending as desired; and groups typically are ongoing, frequently lasting for months or years.

Psycho-Educational Groups

Psycho-educational groups involve a structured program aimed at improving participant knowledge and skills in order to cope more effectively with care-related stresses and provide better care to elderly care recipients. Psycho-educational groups frequently focus on enhancing a particular caregiver skill, such as managing care-recipient problem behaviors, coping with perceived stress, or improving interpersonal relations. Group leaders, for example, may educate caregivers about empowerment techniques, teach specific coping strategies and relaxation techniques, and offer behavioral strategies for increasing participants' positive affective experiences between group meetings.

Psycho-educational groups tend to be highly structured: content is predetermined in accordance with a conceptually based curriculum outline; leaders almost always are professionals trained in psycho-educational techniques; membership is fixed, with members expected to attend every session if possible; and groups typically are time-limited.

One type of psycho-educational group employs cognitive-behavioral principles to train caregivers in depression and anger management using highly structured 2-hour workshops (Coon, Thompson, Steffen, Sorocco, & Gallagher-Thompson, 2003). Each session begins with a review of homework assigned during the previous meeting, followed by a 20- to 30-minute lecture on a specific skill. Anger-management classes focus on recognizing thoughts that lead to feelings of frustration, whereas depression-management classes teach participants about the relationship between pleasant events and mood. The rest of each group session is then spent personalizing the specific skills for group participants through discussion, practice, and homework exercises.

Benefits of Caregiver Support Groups

Existing empirical evidence suggests that support groups can improve the well-being of both the caregiver and the care recipient. For caregivers, support groups can enhance problem-solving skills, decrease stresses related to caregiving, expand knowledge about available services, and improve social and psychological well-being (Toseland & Smith, 2001). In addition, there is some evidence that caregiver support groups can delay nursing-home placement of care recipients and decrease care recipients' use of other health care services. Demonstrated-effect sizes are only small to moderate and depend on the particular type of support group being studied. Moreover, there is some evidence that support groups may be less effective at improving caregiver well-being than are individually oriented caregiver interventions.

Mutual-support groups and psycho educational groups generally have been found to produce somewhat different benefits for caregivers, reflecting the different approaches of the two conceptual models. Mutual-support groups appear to be especially effective at enhancing social support, expanding social networks, and helping caregivers to reassess their interpretations of the caregiving situation, thereby potentially leading to more positive evaluations of their caregiving role. Psycho-educational groups, meanwhile, frequently show more targeted effects on caregiver well-being, including reduced emotional distress, fewer depressive symptoms, increased self-efficacy, and more effective reactions to care-recipient disruptive behaviors (Gallagher-Thompson et al., 2000). Whereas psycho-educational interventions and mutual-support groups both have been found to produce significant positive effects on caregiver burden and care-related knowledge and skills, only psycho-educational interventions also consistently produce gains in subjective well-being, decreases in self-rated depression, and reductions in care-recipient symptoms (Sorensen et al., 2002). Caregivers in psycho-educational groups experience a larger decline in depression, greater use of positive coping strategies, less use of negative coping strategies, and fewer negative social interactions than those in peer-support groups.

Caregiver-Support Groups and Diversity

Relatively little is known regarding the differential impact of support groups on caregivers from diverse racial, ethnic, or socioeconomic groups. What is known is that non-White and Hispanic caregivers are less likely than their White counterparts to participate in caregiver-support groups. This has been attributed to a lack of personal contact by support-group organizers, geographically inconvenient locations for group meetings, and a reluctance to attend a group composed primarily of White caregivers (Henderson, Gutierrez-Mayka, Garcia, & Boyd, S., 1993). Proactive efforts to overcome these barriers through targeted recruitment efforts and culturally appropriate intervention strategies have shown substantial promise. Improved support-group participation and outcomes among Latina caregivers, for example, can result from strategies such as recruiting participants at local senior centers serving Latino communities, creating advertisements printed in both Spanish and English, utilizing bilingual or bicultural group leaders, and adjusting group content to address cultural expectations. By including homework assignments and chalkboards, for example, Latina participants may view group participation as educational and avoid the cultural stigma associated with psychotherapy. With modifications such as these, psycho-educational groups based on cognitive-behavioral principles have been found to result in the same benefits for White and Latina female caregivers. This suggests that caregivers from diverse racial, ethnic, and socioeconomic backgrounds can benefit from caregiver-support groups, but that these services may need to be adjusted to enhance services for diverse populations.

Overall, caregiver-support groups appear to provide caregivers with skills and social support that can increase their caregiving capabilities and personal well-being. Additional research is needed to identify the particular components of support groups that might lead to the greatest benefits for caregivers and their care recipients. Further, researchers need to address racial and ethnic disparities in service utilization, designing more culturally appropriate support groups and psycho-educational groups.

Amanda J. Lehning
Andrew E. Scharlach

See also

Alzheimer's Association
Caregiver Burden
Caregiving Benefits
Caregiving Relationships
Group Psychotherapy
Support Groups

Internet Resources

Center for the Advanced Study of Aging Services, School of Social Welfare, University of California at Berkeley
http://cssr.berkeley.edu/aging/

Family Caregiver Alliance
http://www.caregiver.org/caregiver/jsp/home.jsp

Institute of Gerontology, School of Social Welfare, University at Albany, State University of New York
http://www.albany.edu/ssw/research/instituteofgerontology.htm

National Alliance for Caregiving
http://www.caregiving.org/

Older Adult and Family Center, Stanford University
http://www.stanford.edu/group/oafc/index.htm

REFERENCES

Coon, D. W., Thompson, L., Steffen, A., Sorocco, K., & Gallagher-Thompson, D. (2003). Anger and depression management: Psycho-educational skill training interventions for women caregivers of a relative with dementia. *The Gerontologist*, *43*, 678–689.

Gallagher-Thompson, D., Lovett, S., Rose, J., McKibbin, C., Coon, D., Futterman, A., et al. (2000). Impact of psycho-educational interventions on distressed family caregivers. *Journal of Clinical Geropsychology, 6*, 91–110.

Henderson, J. N., Gutierrez-Mayka, M., Garcia, J., & Boyd, S. (1993). A model for Alzheimer's disease support group development in African American and Hispanic populations. *The Gerontologist*, *33*, 409–414.

Scharlach, A., Sirotnik, B., Bockman, S., Neiman, M., Ruiz, C., & Dal Santo, T. (2003). *A profile of family caregivers: Results of the California statewide survey of caregivers*. Berkeley, CA: University of California, Center for the Advanced Study of Aging Services.

Sorensen, S., Pinquart, M., & Duberstein, P. (2002). How effective are interventions with caregivers? An updated meta-analysis. *The Gerontologist*, *42*, 356–372.

Toseland, R. W., & Smith, T. (2001). Supporting caregivers through education and training. Washington, DC: U.S. Administration on Aging, NFCSP Selected Issue Brief. Available at http://www.aoa.dhhs.gov/prof/aoaprog/caregiver/careprof/progguidance/background/program_issues/Fin-Toseland.pdf#search='toseland%20and%20smith%20supporting%20caregiver%20through%20education%20and%20training.

CAREGIVING BENEFITS

See
Family Caregiver Needs: Assessment

CAREGIVING RELATIONSHIPS

A number of social factors have influenced family-based care, including the aging population, changes in the health care system, the increase in multigenerational households, and a shift from acute to chronic illnesses in older adults. When a family becomes involved in the care of one of its older members, it takes on a new, supportive function. Consequently, a number of structural and functional changes occur within the larger family system that affect many aspects of family life, including family relationships. Structural aspects of family relationships refer to the composition of the family social network and the participation of its members, whereas functional aspects refer to the family's ability to garner different types of support for specific needs (Li, Seltzer, & Greenberg, 1997). Caregiving relationships fall within several domains, including relationships between the caregiver and the care recipient, those among different caregivers, and those between formal (i.e., paid provider, physician, nurse, therapist, and social worker) and informal family-based care providers.

A decision to undertake family-based care can be complicated. The relationships between the caregiver and the care recipient and among the caregivers themselves affect this decision in many ways. The decision also depends on the available resources, which include tangible resources, such as money or the available space in the caregiver's home, and social resources, such as the number and proximity of family members who can help with family-based care. A less tangible resource, but equally important, is the family's ability to discuss and negotiate a plan of family-based care among its members, including the care recipient when possible. To promote successful caregiving relationships, the care recipient and caregivers must acknowledge the perspectives of each person and work to honor the needs, rights, and wishes of all concerned. For example, the family members must determine where the care recipient will live and how the responsibilities of care will be divided, if that is an option. If the care recipient requires a high level of care, providing respite to the primary caregivers is important. Decision making and the delegation of caregiving tasks often require negotiation and compromise among family members to develop a "care plan," or course of action.

Central to the issue of family caregiving are the prior relationships of the care recipient with the caregivers and the relationships between or among the caregivers. When the relationship of the caregiver to the care recipient has been good, the provision of family-based care may be seen as another demonstration of caring, affection, and support. When the relationship with the care recipient has been characterized by periods of ambivalence or conflict, the caregiving relationship is likely to reflect the usual style of relating. Thus, the prior relationship becomes the basis on which the caregiver–care-recipient relationship changes, usually from a relationship with reciprocal support and exchange to one of increased dependency. Issues of personal autonomy become increasingly more critical as the care recipient and family caregiver(s) strive to maintain some independence and achieve a new balance due to the challenges and demands of the caregiving situation.

Similarly, the relationships among multiple family caregivers represent not only their current ways of interacting and solving problems but also the "family ledger" of who owes what to whom. Family caregiving often brings to the forefront prior issues and unresolved conflicts, with a backdrop of stress and emotional reactivity, particularly if the decision about family-based caregiving is sudden. In contrast, watching the gradual deterioration of a family member due to a debilitating illness is difficult, but it allows the family to begin considering options for the care of that member. Because family caregiving is a time of change for all involved, it is also an opportunity for families to strengthen relationships and develop new ways to solve problems. The caregiving relationship can often be a time of bonding for family members and a time for members to appreciate life and feel useful and needed by family (Tarlow et al., 2004).

Women are somewhat more likely to take on the role of primary caregiver. Because women generally outlive men, more women than men may expect to provide family-based care to their spouses. Adult children generally recognize that caregiving responsibility is likely; their chances of doing so are increased if they are married. The adult child with the fewest competing responsibilities (e.g., career, spouse, children) may be the designated caregiver in a family of multiple siblings, although sometimes the most able family member emerges to assume the caregiver role. Work and school schedules and competing family demands affect the type of care given and who provides the care to the care recipient. In some instances, the care recipient nominates a caregiver or expresses preference for specific types of assistance from one or more family members. Parents are less likely to anticipate caregiving to their older children, but as life spans increase, more parents may outlive their children and help in their care when they are ill. Such caregiving to adult children may be extremely burdensome, both physically and emotionally. Caregiving to siblings is somewhat less common, in part because individuals are likely to turn to their children first for caregiving help. In addition, geographic distance between adult siblings may make caregiving impractical and even impair the sibling relationships that undergird family-based caregiving.

A number of background factors influence the type of care and the extent to which family-based care is offered to older persons. The gender of the caregiver likely influences the types of caregiving help provided. Women tend to assist with housekeeping, meal preparation, and personal care, whereas men tend to offer transportation assistance, make household repairs, and manage financial affairs. Factors such as racial and ethnic background, family traditions and history, and religion also influence decisions to care for family members at home and the degree to which family caregivers feel burdened. Historically, persons of color have been more likely to care for family members at home due to a strong sense of family, extended networks of helpers made up of family and friends, financial considerations, and past discrimination by formal health services. There is a higher incidence of caregiving among Asian American, African American, and Hispanic households than White households, and these families are more likely to care for more than one person. Additionally, caregivers in these minority groups are more likely to live with the care recipient and to receive help from others. Thus, caregiving for older persons is not universally distressing, particularly if it is considered a culturally acceptable, rewarding, or expected event.

Other family-based care relationships reflect nontraditional family structures, such as friends, domestic partners, and extended families. Recent social changes have made domestic partners eligible for health care and other benefits that extend the support base to many individuals. Single persons—divorced, widowed, or never married—must rely on their extended families and broader social network, as well as paid help, to provide assistance. In caregiving situations, networks of extended family and friends often deal with the same issues and encounter similar stresses in arranging caregiving responsibilities and tasks.

One form of family-based caregiving that has gained recent attention focuses on grandparents and grandchildren. Increasing numbers of children live in homes maintained by grandparents, with or without one or both parents present. These grandparents' involvement in the daily care of grandchildren is markedly different from that of grandparents who provide day care or baby-sitting or have more traditional grandparenting roles. In situations in which the grandparents take on parenting responsibilities and become surrogate parents to grandchildren, they are likely to have complex relationships with the child's parents. Additionally, grandchildren may directly assist with caregiving to their grandparents.

Where caregiving falls in the life course has an impact on the effects of caregiving. In addition to the relationships with those directly involved in caregiving, other aspects of the caregiver's life are affected (Moen & Chermack, 2005). The type of care necessary and the available supports influence the degree to which caregiving demands spill over into other settings, such as one's work. The Family and Medical Leave Act of 1993, which provides up to 3 months of leave for the care of family members, recognizes and provides support for such caregivers. In some circumstances—for example, debilitating diseases of long duration such as Alzheimer's or Parkinson's disease—the caregiving relationship may be extensive and long-standing; in other cases, caregiving may not extend beyond several months or a year. Maintaining existing relationships with family and friends is important to the caregiver's health, yet the activities of caregiving deplete the time and energy necessary to sustain these relationships. Caregiving over time can lead to increased stress for caregivers (Musil, Morris, Warner, & Saied, 2003). Family caregivers must be assisted to find time and respite to engage in rewarding noncaregiving activities that can prevent burnout and alleviate the burden of caregiving responsibilities.

Due to the importance of family caregiving, health care professionals should work to establish partnerships with family caregivers. Nurses, physicians, social workers, and other health professionals can collaborate with informal caregivers to achieve their mutual goals focused on the care recipient. Professionals must also take the lead in supporting the caregiver, the relationship between the caregiver and the care recipient, and the relationships among the other caregivers as well.

Carol M. Musil
Camille B. Warner

See also

Caregiver Burden
Caregiver Burnout
Family Caregiver Needs: Assessment

Internet Resources

Caregiver Survival Resources
http://www.caregiver911.com

Caregiving Online
http://www.caregiving.com

Family Caregiver Alliance
http://www.caregiver.org

National Family Caregivers Association
http://www.nfcacares.org

REFERENCES

Li, L., Seltzer, M., & Greenberg, J. (1997). Social support and depressive symptoms: Differential patterns in wife and daughter caregivers. *Journals of Gerontology: Psychological Sciences and Social Sciences*, *52B*, S200–S211.

Moen, P., & Chermack, K. (2005). Gender disparities in health: Strategic selection, careers, and cycles of control. *Journals of Gerontology: Psychological Sciences and Social Sciences*, *60B*, S99–S108.

Musil, C., Morris, D., Warner, C., & Saied, H. (2003). Issues in caregivers' stress and providers' support. *Research on Aging*, *25*, 505–526.

Tarlow, B., Wisniewski, S., Belle, S., Rubert, M., Ory, M., & Gallagher, D. (2004). Positive aspects of caregiving: Contributions of the REACH project to the development of new measures for Alzheimer's caregiving. *Research on Aging*, *26*, 429–453.

CASE MANAGEMENT

Case management (also known as care management, care coordination, and service coordination) has become a familiar service and function in the provision of health and social services for older adults. Various models of case management have emerged in primary, acute, home, and long-term care, and most recently in managed care. Case-management practice varies; depending on the agency and program, case managers may be nurses, social workers, physicians, or other health-care professionals.

History

Case management was a core service in the series of community-based long-term-care demonstration projects initiated in the early 1970s. A primary goal of these projects was to delay or avoid premature or inappropriate nursing-home placement. Medicaid funds, available through federal waivers, were used to support community-based care plans for eligible individuals, and each client was assigned a case manager. Service coordination, accomplished through case management, was viewed as necessary to overcome the obstacles encountered in highly fragmented delivery systems.

Subsequent expansion of community-based care has been fueled by two major trends. First, funding for home- and community-based services has increased. Second, federal and state legislation mandates case managers to arrange and monitor community-based long-term-care services for program clients. Driven by the introduction of diagnosis-related groups (DRGs), case management has also emerged in acute care, as pressure for timely and appropriate discharge has increased. In this context, case managers utilize care maps and critical pathways to monitor patients' progress and develop discharge plans to settings that meet patients' needs. Acute-care case managers focus on quality, cost-effective, timely, and appropriate service provision.

Definition

The National Advisory Committee on Long-Term-Care Case Management defines case management as a "coordinating service that helps frail elders and others with functional impairments and their families identify and secure cost effectively administered services appropriate to the consumers' needs" (Connecticut Community Care, Inc., 1994, p. 5). In managed care, case management is "active oversight of healthcare delivery [that] will ensure individuals receive appropriate and quality service in a cost-effective manner" (Murer & Lenhoff-Brick, 1997, p. 3).

Case management includes many program-specific definitions. In community-based long-term care, the case-management process includes outreach, screening, assessment, care planning, plan implementation, monitoring, and reassessment. In managed care, cost containment pervades and guides the case-management process. A case manager may not be assigned to every case, but case managers working in managed-care settings have the authority to approve or deny services based on cost and benefit caps. Hence, in any given setting or program, case management reflects characteristics of the target population as well as the structure of the program's funding. As such, there is considerable variation in implementation of case-management activities. Caseload size also varies considerably, reflecting the diversity of programs, target populations, and settings where case managers are employed.

Generic Components of Case Management

Outreach attempts to identify persons likely to need case management, given the complexity of their circumstances. Target populations are specified and operationally defined in policy and program regulations. In managed care, potentially high-cost cases are identified before initiating service delivery. Standardized protocols are used in *screening*, which is a preliminary assessment of a client's circumstances and resources to determine presumptive eligibility. Outreach and screening are important gatekeeping mechanisms that affect the accuracy of the program's targeting efforts, the effectiveness of cost-containment mechanisms, and program operation and management.

Comprehensive assessment is a "method for collecting in-depth information about a person's social situation and physical, mental and psychological function which allows identification of the person's problems and care needs" (Schneider & Weiss, 1982, p. 12). Comprehensive assessment focuses on several domains: physical health, cognitive functioning, emotional status, ability to perform activities of daily living (ADL), social supports, physical environment, and financial resources. Comprehensive multidimensional assessment using standardized instruments is considered a best practice.

Care planning uses information collected during the assessment process. It requires clinical judgment, knowledge of community resources, creativity, and the participation of clients and caregivers. Care planning is a key resource-allocation process. The care plan specifies services, providers, frequency of service delivery, and costs. Critical considerations in care-plan development are the willingness and availability of informal caregivers. Balance between formal and informal services is a major consideration in the care-planning process.

Service arrangement involves contacting formal and informal providers to arrange services specified in the care plan. Case managers often negotiate for services with providers when making referrals to other agencies. When case managers have the authority to purchase services on their clients' behalf, they may order services directly from providers.

Case managers systemically *monitor* changes in clients' situations and alter care plans to meet clients' current needs. Ongoing monitoring, combined with timely modification of care plans, helps ensure that program expenditures reflect current client needs and are not based on outdated assessment data.

Reassessment involves determining whether changes in a client's situation have occurred since the last assessment. Systematic and regularly scheduled reassessments also assist in evaluating the attainment of outcomes specified in the care plan.

The Changing Context

Recently, the practice of case management has been affected by the movement toward consumer direction and the legal implications of the *Olmstead* decision. The U.S. Supreme Count's decision in *Olmstead v. L.C.* (1999) invoked the "integration mandate" of the Americans with Disabilities Act requiring public agencies to provide services in the most integrated setting appropriate to the needs of qualified individuals. The Court held that states cannot make institutional placement a condition for receiving publicly funded health care and that such requirements constitute illegal discrimination. Olmstead required states to further expand their home- and community-based services, potentially affecting the care of large numbers of institutionalized and community-residing older adults (Fishman, Vladeck, Palermo, & Davis, 2003).

The best practice of case management requires meaningful inclusion of clients and caregivers in care-plan development; it is essentially a professionally controlled process. The Cash and Counseling Demonstration, implemented in Arkansas, New Jersey, New York, and Florida, tested a model that significantly enhanced consumer direction by allowing some clients (in the cash-allowance group) to make personal choices about how to spend Medicaid funds to meet their personal-assistance needs. Other clients received traditional agency-delivered services, including traditional case management. Clients in the cash-allowance group worked with a counselor to develop a personal-assistance-care spending plan and were provided with financial management and counseling services (Dale, Brown, Phillips, Schore, & Carlson, 2003; Mahoney, Simon-Rusinowitz, Loughlin, Desmons, & Squillace, 2004). Consumer-directed service options are being developed or under consideration in state Medicaid programs.

Both consumer direction and case management will continue to be significant elements in the care of older adults, and it appears that the locus of control has shifted toward clients and their families. The future practice of case management will be shaped by this tension.

Carol D. Austin

See also

Continuing Care Retirement Communities

Naturally Occurring Retirement Communities (NORCs)

Internet Resources

Cash and Counseling
http://www.cashandcounseling.org

Cash and Counseling Evaluation
http://www.mathematica-mpr.com/disability/cashcounseling1.asp

Case Management Resource Guide
http://www.cmrg.com

National Association of Professional Geriatric Case Managers
http://www.caremanager.org

National Conference of State Legislatures
http://www.ncsl.org

Olmstead Decision, Center for an Accessible Society
http://www.accessiblesociety.org

REFERENCES

Connecticut Continuing Care, Inc. (1994). *Guidelines for case management practice across the long-term care continuum: A report of the National Advisory Committee on long-term-care case management*. Bristol, CT: Connecticut Community Care, Inc.

Dale, S., Brown, R., Phillips, B., Schore, J., & Carlson, B. (2003). The effects of cash and counseling on personal care services and Medicaid costs in Arkansas. *Data Watch, 19*. Washington, DC: Project Hope.

Fishman, E., Vladeck, B., Palermo, A., & Davis, M. (2003). *The* Olmstead *decision and long-term care in California: Lessons on services, access, and costs from Colorado, Washington, and Wisconsin*. Sacramento, CA: California Healthcare Foundation.

Mahoney, K., Simon-Rusinowitz, L., Loughlin, D., Desmons, S., & Squillace, M. (2004). Determining personal care consumers' preferences for consumer-directed cash and counseling option: Survey of results from Arkansas, Florida, New Jersey, and New York elders and adults with disabilities. *Health Services Research*, *39* (3), 643–664.

Murer, C., & Lenhoff-Brick, D. (1997). *The case management handbook*. New York: McGraw Hill.

OLMSTEAD V. L. C. (98-536) 527 U.S. 581 (1999) 138 F.3d 893.

Schneider, B., & Weiss, L. (1982). *The channeling case management manual*. Washington, DC: U.S. Department of Health and Human Services, Health Care Financing Administration.

CATARACTS

The lens of the eye accounts for approximately 30% of its focusing power and is the only part of the eye that can change shape to allow focus on objects at different distances. Loss of the lens's ability to change shape, presbyopia, is an age-related change. A cataract is opacity in the normally transparent lens. It is not a "film" or "growth" over the eye but rather a loss of clarity that can occur at any age and for a variety of reasons, although normal aging of the lens is the most common cause. Virtually everyone who lives long enough will develop a cataract. There is no medication that can prevent or reverse a cataract once it forms.

Symptoms

Symptoms vary with the type and density of the cataract and with the patient's activity level and visual needs (Duvall, Lens, & Werner, 1999). Slowly progressive cataracts and nuclear or cortical cataracts (affecting the central nucleus or the outer cortex of the lens) may be less visually disturbing than a rapidly progressing posterior subcapsular cataract (typically a dense, focal change on the visual axis). A bedridden 83-year-old person is affected differently by a cataract than an active 63-year-old person with work-related visual demands. Clinicians have to be aware that cataracts do not affect each person the same way.

The presenting complaint may be blurry vision at a distance, near, or both; inability to see street signs while driving; difficulty with small print; or a "film" or "fog" over the eye, indicative of clouding of the lens. Because a cloudy lens scatters light more than a clear lens, patients are often bothered by glare from bright lights. Another interesting phenomenon is "second sight," in which the changes in the lens increase myopia or nearsightedness, allowing the patient to see better up close without glasses; some patients are able to read without glasses or bifocals.

Assessment

Assessment of a cataract patient begins with a thorough eye examination, keeping in mind that cataract is not the only cause of visual change in the elderly (Buettner, 2002; Chang & Gimbel, 2004; Duvall, Lens, & Werner, 1999; Parker & Parker, 2002). Macular degeneration, glaucoma, and other eye diseases are potential causes of vision loss in the geriatric population that can be ruled out by a comprehensive eye examination.

Treatments

Cataracts do not improve with time and will worsen (although at different rates in different people); thus, the timing of surgery is usually when eyeglasses or other visual aids are no longer helpful. Many can be helped with appropriate visual aids such as frequent changes in spectacle prescription, magnifiers, contrast-enhancing lenses, tints, and glare-reducing lenses, which may improve the patient's function and delay the need for surgery temporarily or permanently (Chang & Gimbel, 2004; Duvall, Lens, & Werner, 1999). Surgery should be recommended when the cataract prevents the patient from performing some or all basic or instrumental activities of daily living (ADL). There is no need to wait for the lens to "ripen," as in the past, nor is there any absolute visual acuity level that must be reached before surgery is undertaken.

Current techniques in cataract surgery make it among the safest and most common surgical procedures performed in the United States. Understanding the procedure can make it easier to decide on surgery when it is indicated.

Typically, the 10- to 15-minute procedure is done on an outpatient basis at an ambulatory or outpatient surgery center. The patient is usually able to resume nonstrenuous, everyday activities within 24 hours. Preoperative assessment includes a complete examination and measurements of the eye to determine the appropriate power of the intraocular lens (IOL) that will replace the cataractous lens (Duvall, Lens, & Werner, 1999; Parker & Parker, 2002). A physical examination, laboratory work, and an electrocardiogram may be required. The extent of the preoperative physical depends on the patient's health, most recent physical examination, and requirements of the center where the procedure will be done—all of which should be clearly specified prior to the surgery.

The patient may be prescribed topical antibiotics in the days before surgery to reduce the risk of intraoperative infection. Nonsteroidal anti-inflammatory drugs are sometimes used as well. Nothing should be taken by mouth except clear liquids after midnight the night before the procedure. Upon arrival at the surgery center, the patient is administered several topical eyedrops for antibiosis and to dilate the pupil. They may also be given a mild sedative for relaxation. Immediately before the surgery, the eye is anesthetized. Topical anesthesia has become the anesthesia of choice in modern cataract surgery. It carries the least risk, causes the least patient discomfort, provides the fastest recovery, and eliminates the apprehension associated with injection. However, the patient feels some sensation during the procedure and can move the eye. A skillful surgeon and good preoperative instructions to the patient are strongly recommended. In some circumstances, local injection around the eye may be used to provide deep anesthesia and to arrest eye movements. Risks are minimal, but there is a chance of damage to the structures around the eye. General anesthesia is rarely used (Buettner, 2002; Chang & Gimbel, 2004; Duvall, Lens, & Werner, 1999; Parker & Parker, 2002).

Modern cataract surgery involves the removal of the opacified lens and insertion of an IOL in its place. The IOL replaces the focusing power of the lens and obviates the need for the thick cataract glasses or contact lenses of the past. Current IOLs are typically "foldable," allowing them to be placed into the eye through a smaller incision, which is associated with faster rates of healing and fewer complications; this has led to the development of the self-healing, "no-stitch" type of cataract procedure. Clear cornea surgery—incision through the avascular cornea—is the most common type of surgery used today and is associated with the fastest healing and fewest complications.

Although IOLs replace the focusing power of the lens, most IOLs are fixed-focus lenses; they cannot adjust to different planes of focus as can the normal lens. Patients often require reading glasses after surgery, and they need to be advised of this. Fixed-focus IOLs provide quality distance vision under a variety of different lighting conditions. Recent enhancements have provided even better vision than was previously available.

The biggest change in cataract surgery in the last few years is the greater availability and quality of lenses with variable focus (Chang & Gimbel, 2004). Successful implantation of these IOLs provides the patient with clear distance and near vision without glasses. There are two types of variable-focus IOLs. Accommodating IOLs have a single focal plane, but this focal plane can shift position from far to near and vice versa. The IOL changes its focal plane by physically moving inside the eye in response to movements of the eye muscles. Currently, there is only one lens of this type that has been approved by the FDA, but this lens has been shown to give excellent distance, near, and intermediate (e.g., at the computer) vision. Multifocal IOLs differ from accommodating IOLs in that they can bring light into focus from more than one point at the same time, similar to multifocal spectacle lenses. The two FDA-approved IOLs of this type provide very good distance and near vision with a reported increase in night-vision problems.

Surgical Follow-Up

Following surgery, the eye may or may not be patched, depending on the surgeon's preference and the type of procedure performed. The trend is toward the use of a removable eye shield that allows the administration of postoperative medications or no patch at all. Postoperative medications include antibiotic drops to prevent infection and steroid drops to reduce inflammation; sometimes these are given as a combination drop.

Most patients are mildly uncomfortable the first day and night after surgery. Pain is much less of a factor, however, with the advent of small-incision procedures. Intense pain is unexpected and should be reported to the surgeon at once. The first postoperative visit is the day after surgery; if there are no complications, the next follow-up visit is 1 to 2 weeks following surgery. Antibiotic drops are usually discontinued after 1 week, whereas steroid drops are gradually tapered, depending on the degree of inflammation. Glasses are usually prescribed approximately 4 weeks following surgery. The patient must be alert for and report any significant decrease in vision, pain, redness, discharge, flashes of light, or new "floaters" (i.e., black spots in front of the eye) throughout the postoperative period (Parker & Parker, 2002).

Possible Complications

Posterior capsular opacification is a common postoperative complication. In most cataract surgeries, the lens capsule is left in place to support the IOL.

This can serve as a site for the growth of lens tissue that clouds the vision; the patient reports feeling that the cataract has grown back. Patients must be assured that once a cataract is removed, it does not come back. A capsulotomy involves making a clear opening in the posterior capsule using the yttrium-aluminum-garnet (YAG) laser, which easily treats this capsular change, takes a few minutes, and is done in the surgeon's office. The incidence of this problem has greatly decreased in recent years because of improved surgical technique and changes in IOL materials (Parker & Parker, 2002).

Cataracts need not be the debilitating eye condition they once were. Appropriate education and use of visual aids can markedly improve function prior to the need for surgery. Current surgical techniques have minimized postoperative discomfort, reduced recovery time, and allowed the rapid return of quality vision. The IOL frees postoperative cataract patients from the cumbersome cataract glasses or contact lenses of the past. The future promises the increased use of variable-focus IOLs that function more like the natural lens of the eye.

Richard J. Madonna

See also

Low Vision
Vision Changes and Care
Vision Safety

Internet Resources

All About Vision
http://www.allaboutvision.com/conditions/cataracts.htm

American Academy of Ophthalmology
http://www.aao.org/

American Optometric Association
http://www.aoa.org/x1795.xml

Medline Plus
http://www.nlm.nih.gov/medlineplus/cataract.html

National Eye Institute
http://www.nei.nih.gov/health/cataract/cataract_facts.asp

National Institutes of Health
http://nihseniorhealth.gov/cataract/toc.html

REFERENCES

Buettner, H. (Ed.) (2002). *Mayo Clinic on vision and eye health: Practical answers on glaucoma, cataracts, macular degeneration, and other conditions*. Rochester, MN: Mayo Foundation for Medical Education & Research.

Chang, D. F., & Gimbel, H. (2004). *Cataracts: A patient's guide to treatment*. Omaha, NE: Addicus Books.

Duvall, B. S., Lens, A., & Werner, E. B. (1999). *Cataract and glaucoma for eyecare professionals*. Thorofare, NJ: Slack, Inc.

Parker, J. N., & Parker, P. M.(2002). *The 2002 official patient's source book on cataract surgery*. San Diego, CA: ICON Health Publications.

CENTENARIANS

Centenarians are, of course, people who have lived to the age of 100 or beyond. Centenarians are becoming more common, with some 100,000 estimated to have been living in 2000 (Coles, 2004), and about 40,000 of these in the United States. Death rates are decreasing exponentially among the *oldest-old*, suggesting that the numbers of centenarians will continue to increase rapidly. Some researchers believe that half of all girls born in the developed world today and a good part of the boys will live to the age of 100 or beyond (Vaupel, 2000). *Supercentenarians* (those aged 110 years and older) are also appearing (Coles, 2004): there are now approximately 40 proven supercentenarians alive at any one time. The oldest age ever attained is 122, by *Jeanne Calment* of France, who died in 1997. The oldest proven age for a male is 115 years, by *Christian Mortensen*, a Danish-born American who died in 1998.

There appear to be clusters of centenarians. In most of the developed world, there is a ratio of 1 centenarian per 10,000 population. In Sardinia, this ratio is about 1.5/10,000. On the Japanese island of *Okinawa*, it is closer to 3.5/10,000. The reasons for clusters are not known. These populations may have genes which promote longevity or good health, or it could be a combination of lifestyle and luck.

Death rates among centenarians do not increase as rapidly as death rates for people in their 90s—in other words, there is a deceleration in the rate of mortality increase. This is believed to be due to *heterogeneity of frailty*, or the fact that some people have a low probability of death all their life, and in extreme old age only they are left (as those with higher probabilities of death are no longer alive), thus giving the appearance of a drop in death rates (Vaupel, Carey, Christensen, Johnson, Yashin, Holm, et al., 1998).

Popular beliefs hold that old age is a difficult time, with profound disability and many losses, but detailed studies of centenarians show that this is not true. These studies carefully prove the ages of the centenarians; reports of communities with many people living to 150 years or beyond have been shown to be false, which is why recent studies put a great deal of effort into validating the ages. Although most centenarians worldwide are women (in a ratio of 5:1), on the island of *Sardinia* the ratio is only 2 women for every 1 man (Koenig, 2001); the reason for this is not known, but it may be genetic.

Regarding health, one area where most centenarians do have a great deal of trouble is with sensation: most have significant impairment in sight and hearing. Not all centenarians have been healthy all their lives. Researchers from the *New England Centenarian Study* classified centenarians into 3 groups: those who had escaped most major illnesses, those who had delayed major illnesses, and those who had survived major illnesses (Evert, Lawler, Bogan, & Perls, 2003). There was a difference between men and women, with more men in the group of having escaped illnesses (32% vs 15%). Few centenarians had experienced heart disease, cancer, or stroke. *Children of centenarians* have similar health profiles, with many not having the common risk factors predisposing them to heart disease or stroke.

Many centenarians share a characteristic *"serene" personality*: they generally accept what they cannot change, and enjoy the life they have been given. Although long studies would be required to prove this, it is likely that this attitude is lifelong for many centenarians.

Not all centenarians are cognitively impaired; after detailed testing in population-based studies 20% to 40% were shown to have no cognitive impairment (Silver, Jilinskaia, & Perls, 2001). Pure Alzheimer's disease may be less common in this age group, and a susceptibility gene for late onset Alzheimer's, the *E4 allele* of the *apolipoprotein E gene*, may not exert any negative affect among centenarians. The work of Perls and colleagues suggests that a substantial number of centenarians are relatively independent in their level of function (37%).

Supercentenarians are overwhelmingly (90%) female (Coles, 2004). As with younger centenarians, most have significant hearing, vision, and mobility problems, as well as difficulty with memory. Most also come from long-lived families, and have been in good health all their lives.

Centenarians are of interest to the general public because of their accomplishment, but their interest to science is more than just novelty. The study of centenarians can provide insight into the *biology of aging*, as well as the mechanisms and prevention of frailty. For example, *calorie restriction* has been shown to delay signs of aging in laboratory animals. Both observational and population level studies suggest that calorie restriction may be beneficial in humans, too. Studies of *centenarians and their diets* may shed some light on this possibility.

There is a great deal of interest in using centenarians to study the *genetics of aging*. Laboratory research with simple organisms suggests that there actually may be genes which control aging (Hekimi & Guarente, 2003). Researchers in New England have found *long-lived families* and identified chromosomes that may carry genes related to their longevity (Perls & Terry, 2003). Other researchers have found that centenarians carry forms of genes that lower the risk for common health problems, like high cholesterol, leading to the question of whether the absence of disease might explain centenarians' longevity (Barzilai, Atzmon, Schechter, Schaefer, Cupples, Lipton, et al., 2003). However, it may also be that centenarians do not carry genes which increase the risk of common diseases, or that they are somehow resistant to the effects of detrimental genes. This last possibility fits with the theory of *Inflamm-Aging*, developed by researchers with the *Italian Centenarian Studies*. They have found evidence that centenarians are relatively resistant to the negative effects that the inflammatory response usually has on the human organism (Franceschi & Bonafe, 2003). A new European study, the *Genetics of Healthy Ageing*, will provide a large amount of valuable data over the coming decades, and hopefully answer many questions about centenarians and aging. Nevertheless, some scientists believe that aging is random process and that an aging gene will never be found (Hayflick, 2004).

We have much to learn from centenarians, but probably the most valuable lesson is that it is possible to live a long, healthy, happy life. Although part of a centenarian's success may be genetic, genes are not everything. It is important to remember that lifestyle does affect how we age, and it is never too late to make a change for the better.

Chris MacKnight

See also
Life Expectancy
Life Extension

REFERENCES

Barzilai, N., Atzmon, G., Schechter, C., Schaefer, E. J., Cupples, A. L., Lipton, R., Cheng, S., & Shuldiner, A. R. (2003). Unique lipoprotein phenotype and genotype associated with exceptional longevity. *Journal of the American Medical Association*, *290*(15), 2030–2040.

Coles, L. S. (2004). Demography of human supercentenarians. *Journal of Gerontology: Biological Sciences*, *59A*(6), 579–586.

Evert, J., Lawler, E., Bogan, H., & Perls, T. (2003). Morbidity profiles of centenarians: Survivors, delayers, and escapers. *Journal of Gerontology: Biological Sciences and Medical Sciences*, *58*(3), 232–237.

Franceschi, C. & Bonafè, M. (2003). Centenarians as a model for healthy aging. *Biochemical Society Transactions*, *31*, 457–461.

Hayflick, L. (2004). "Anti-aging" is an oxymoron. *Journal of Gerontology: Biological Sciences*, *59A*(6), 573–578.

Hekimi, S., & Guarente, L. (2003). Genetics and the specificity of the aging process. *Science*, *299*, 1351–1354.

Koenig, R. (2001). Sardinia's mysterious male methuselahs. *Science*, *291*, 2074–2076.

Perls, T., & Terry, D. (2003). Determinants of exceptional longevity. *Annals of Internal Medicine*, *139*(5 Pt 2), 445–449.

Silver, M. H., Jilinskaia, E., & Perls, T. T. (2001). Cognitive functional status of age-confirmed centenarians in a population-based study. *Journal of Gerontology: Psychological Sciences*, *56B*(3), P134–P140.

Vaupel, J. (2000). Setting the stage: A generation of centenarians? *Washington Quarterly*, *23*(3), 197–200.

Vaupel, J. W., Carey, J. R., Christensen, K., Johnson, T. E., Yashin, A. I., Holm, N. V., Iachine, I. A., Kannisto, V., Khazaeli, A. A., Liedo, P., Longo, V. D., Zeng, Y., Manton, K. G., & Curtsinger, J. W. (1998). Biodemographic trajectories of longevity. *Science*, *280*(8), 855–860.

CEREBROVASCULAR DISEASE

See
CardioVascular System: Overview Vascular and Lewy Body Dementias

CHEST PAIN: NONCARDIAC CAUSES

Chest pain (CP) is one of the most frequent complaints encountered in both the young and old. The causes of chest pain fall into two main categories: cardiac and noncardiac. Clinicians should first use validated decision aids and markers to rule out life-threatening ischemic and nonischemic cardiovascular disease, acute myocardial infarction (MI), unstable angina, aortic dissection, and pericarditis. Patients with chest pain that is predictably exertional, with EKG abnormalities, or with cardiac risk factors should have troponin levels checked and cardiac stress-testing performed. Once acute cardiac disease is excluded, other differentials should be pursued.

The most common causes of noncardiac chest pain are from nearby organs. This includes pulmonary embolism (PE), pneumonia, pneumothorax, and pleuritis from the lungs; and esophagitis, spasm, and gastroesophageal reflux disease (GERD) from the esophagus. Also, biliary colic, choledocholithiasis, cholangitis, peptic ulcer disease, and pancreatitis from the gastrointestinal system; and costochondritis, fibrositis, rib fractures, sternoclavicular arthritis, and herpes zoster prodrome from the musculoskeletal and cutaneous structures. Chest pain may also be associated with psychiatric illness: hyperventilation, anxiety, panic and somatoform disorders, affective (depression), and fixed delusion disorders.

Pulmonary embolus, generalized anxiety disorder, costochondritis, and herpes zoster are the most common causes of noncardiac CP and are considered herein.

Pulmonary Embolism

Pulmonary embolism (PE) is an occlusion of a portion of the pulmonary vascular bed by an embolus. PE is the most common cause of pulmonary disease in hospitalized patients. It is the third leading cause of death in the United States, accounting directly for 500,000 deaths per year and contributing indirectly to another 200,000 deaths per year. Approximately 50% of these deaths occur within 2 hours of the embolic event because of failure to detect and treat the PE promptly.

PE and deep vein thrombosis (DVT) are the manifestations of venous thromboembolism (VTE). Inherited risks for VTE include antithrombin, protein C, and S deficiencies, and presence of factor V Leiden prothrombin mutation. Acquired risks include age, major general surgery, lower-extremity fracture, hip or knee replacement, spinal-cord injury, major trauma, pregnancy, oral contraceptives, hormone replacement, prolonged bedrest, stroke, or travel longer than 4 to 6 hours. Chronic medical illnesses such as congestive heart failure, obesity, stroke, chronic lung disease, cancer, and previous VTE also increase risk.

Symptoms of PE are nonspecific and include pleuritic-type chest pain, acute dyspnea, hemoptysis, fever, tachycardia, and anxiety. The most common signs are tachypnea, tachycardia, rales, accentuated pulmonic component of the second heart sound, and new onset atrial fibrillation.

Diagnosis of PE combines clinical testing with a pretest clinical probability of disease often using the Wells score, which uses clinical criteria to estimate the probability of PE (Wells, Anderson, & Ginsberg, 2000). Noninvasive tests that can be used to aid in the diagnosis of PE include V/Q scan, D-dimer test, helical computed tomography (spiral CT), and lower-extremity ultrasound. However, no single test reliably excludes PE. Arterial blood gases are unreliable in geriatric patients and the diagnostic yield of V/Q scan decreases with age. Pulmonary angiogram remains the "gold standard" for diagnosis of PE but is invasive, costly, and has associated risks. A low clinical suspicion for PE (e.g., Wells score less than 2) plus a normal quantitative ELISA D-dimer assay safely rule out PE. If further testing is needed, spiral CT with a lower-extremity ultrasound can be used to rule in or rule out PE.

Initial therapy should begin immediately with unfractionated heparin or low molecular weight heparin (LMWH) (Hirsh et al., 2001). Medications commonly used for long-term management include oral warfarin or subcutaneous LMWH for those who do not tolerate warfarin. LMWH is safe, effective, and cost-effective in appropriate patients. It is given subcutaneously twice a day at a fixed dose based on weight. Monitoring is usually not required in patients with normal renal function; patients with impaired renal function are at risk for bleeding complications, and LMWH should be used with caution in the elderly. Alternatively, for patients who cannot tolerate anticoagulation, an inferior vena cava (IVC) filter can be placed. The role of thrombolytic therapy for venous thrombo-embolism remains uncertain.

Gastroesophageal Reflux Disease.

Gastroesophageal reflux disease (GERD) is a chronic relapsing condition characterized by an incompetent lower esophageal sphincter (LES) resulting in retrograde flow of stomach contents into the esophagus. Symptoms vary and include pyrosis (heartburn), early satiety, abdominal fullness, bloating, dysphagia, odynophagia, belching, chronic cough, hoarseness of voice, and noncardiac chest pain. (See chapter on Gastrointestinal Diseases chapter for a full discussion of GERD).

Generalized Anxiety Disorder

Generalized anxiety disorder (GAD) is highly prevalent, with rates of 7.3% reported in older populations (Beekman et al., 1998). Anxiety syndromes and common medical illness of late life may be coincidental co-morbid conditions. The elderly exhibit varying degrees of unease, apprehension, or disproportional worry about multiple real or projected problems. Fatigue, restlessness, irritability, muscle tension, and sleep disturbance are usually present. Symptoms vary with each individual but are often punctuated by bursts of autonomic activity that include chest pain, palpitations, tachycardia, hyperventilation, dyspnea, globus hystericus, indigestion, paresthesia, and sweating. Chest pain is often described as acute and sharp over the precordial area.

As soon as medical causes are excluded, further testing may include the use of observer- or self-rated instruments. The Hamilton Anxiety scale (HARS) is a commonly used observer-rated scale. The most frequently used self-rated scales are the State Trait Anxiety Inventory (STAI), the symptom checklist –90R(scl-90R), and the Beck Anxiety Inventory (BAI).

Effective management of CP secondary to GAD includes psychotherapy and aggressive patient education. Psychotherapy should address modifications in both cognitive and behavioral strategies (CBT) (Wetherell et al., 2005). Other techniques that may be helpful include relaxation therapy, biofeedback, visualization, medication, exercise, and desensitization. Severe anxiety may warrant medication. The selective serotonin reuptake inhibitors (SSRIs), the selective serotonin/norepinephrine reuptake inhibitors (SNRIs), and the 5HT2 antagonists have emerged as first-line treatment for GAD because they have good efficacy and safety profiles. The azipirones are well tolerated and have the advantage of decreased dependence, absence of withdrawal on discontinuation, and decreased psychomotor impairment with long-term use as compared to the benzodiazepines. However, patient response is inconsistent. Benzodiazepines are effective and act promptly but their side-effect profiles are a major disadvantage for long-term use in older populations. Tricyclic antidepressants (TCAs) have also been effective. Other medications such as the monoamine oxidase inhibitors (MAOIs), beta-adrenergic receptor antagonists, and anticonvulsants may be tried in patients refractory to SSRIs and SNRIs.

Costochondritis

Musculoskeletal chest pain is often insidious and persistent, lasting for hours to days. It is frequently sharp and localized to a specific area (e.g., xiphoid, lower rib tips, or midsternum) but may be diffuse and poorly localized. Most chest-wall pain is positional and exacerbated by deep breathing, coughing, sneezing, turning, and upper trunk or arm movement. Unfortunately, similar pain is also seen in other visceral processes involving the pleura and pericardium. Costochondritis is the most common type of musculoskeletal pain, due to idiopathic inflammation at the costochondral and costosternal articulations. It affects women more than men and is usually seen in patients older than 40 years of age. Focal tenderness is often present on palpation. The onset of chest pain from costochondritis occurs more in the afternoon versus the more traditional early morning chest pain associated with myocardial infraction.

Musculoskeletal symptoms simultaneously present in areas other than the chest may alert the physician to other musculoskeletal diseases—for example, ankylosing spondylitis or fibromyalgia. The most consistent finding is the reproducibility of pain with various maneuvers like the crowing rooster, horizontal arm flexion, and hooking maneuvers. There is no single diagnostic blood test. Radiographic tests may be helpful to rule out musculoskeletal diseases.

Nonsteroidal anti-inflammatory agents (NSAIDs) and local heat are the cornerstones of therapy. A lidocaine-corticosteroid preparation injected into joints may offer some relief. Refractory cases may require surgery for resection of the involved cartilage. Activity should be resumed as tolerated, with avoidance of aggravating maneuvers that affect the pectoralis major muscles during repetitive activity. Proper posture alignment and stretching exercises on a regular basis can alleviate symptoms and decrease recurrence. The patient should be advised that improvement is often gradual, occurring over several weeks, and that recurrence is possible. Patient education is focused on etiology, signs and symptoms of decompensation, and conditioning.

Varicella Infection: Herpes Zoster

Herpes zoster (HZ) virus initially causes chicken pox in 60% to 90% of individuals who have had primary infection. It then becomes latent in the cranial nerves and dorsal-root ganglia and remains indefinitely (Gnann & Whitley, 2002). HZ reactivates decades later, resulting in shingles. Incidence may be as high as 50% in those older than 85 years; one in five of these will develop post-herpetic neuralgia (PHN), which is residual pain lasting longer than 1 month after resolution of the HZ rash. The incubation period of HZ ranges from 2 to 3 days. The typical vesicular rash develops over 3 to 5 days and de-crusts over the following 2 to 3 weeks. The infectious period begins from the incubation period and persists through the period of new lesion formation. The trunk is most often affected; the rash usually erupts among unilateral dermatomes and is pruritic and painful. When C6 through C8 dermatomes are involved, the prodrome includes anterior radiating chest pain, which is easily mistaken for a heart attack. Chest pain is described as a sharp, burning, or stabbing pain.

Diagnosis of shingles is made by recognition of the rash. Tests are rarely necessary except in atypical cases. Tzanck smear is helpful when the diagnosis is uncertain but does not distinguish HZ from herpes simplex. Direct immunofluorescence of scrapings can distinguish between the two viruses. Varicella antibodies titers can also be measured.

Treatment should focus on symptom relief and dosing convenience, especially for older patients. Antipruritic measures, including oatmeal baths, baking soda, calamine lotion, analgesics, and anti-inflammatory medications, should be tried. Side effects of sedating antihistamines outweigh their usefulness in the geriatric population. Lesions should be kept clean with mild soaps; no dressing is necessary. Persons with no history of chicken pox or chicken-pox vaccine should avoid contact with infected individuals.

Antiviral therapy instituted within 36 to 72 hours of onset of rashes decreases the duration of acute pain and rash and may also decrease duration of PHN but not its incidence. Three oral antiviral agents have been approved: acyclovir, which is taken five times a day, or famciclovir and valacyclovir, which are taken three times a day. Valacyclovir is more cost-effective. The addition of prednisone may hasten rash healing and reduce severity of pain but has no effect on duration and incidence of PHN.

Tricyclic antidepressants are effective for neuropathic pain, but their side-effect profile is undesirable in the older-patient population. Gabapentin is an effective treatment; it is better tolerated in divided doses. Capsaicin 0.075% cream can reduce neuropathic pain, but its burning sensation is often not tolerated. Opioids should be avoided especially in older patients because of side effects.

Two vaccines are now available. One, a live varicella-zoster vaccine, is FDA-approved for adults 60 and older to prevent shingles in those previously infected with varicella. It may also to be effective in reducing the incidence of post-herpetic neuralgia. Another far lower potency vaccine is available to prevent chicken pox and is usually administered to children. It should be considered for those high-risk patients who have never had chicken pox.

BHARATHI RAMAN

See also

Anxiety and Panic Disorders
Coronary Artery Disease
Gastrointestinal Diseases
Heartburn

Internet Resources

The American College of Gastroenterology
http://www.acg.gi.org

National Guidelines Clearing House
http://www.guideline.gov/summary/summary.aspx?doc_id=5893

National Institute for Allergy and Infectious Diseases, National Institutes of Health
http://www.niaid.nih.gov/factsheets/shinglesFS.htm

National Institute of Mental Health
http://www.nimh.nih.gov/healthinformation/gadmenu.cfm

REFERENCES

Beekman, A. T. F., Bremmer, M. A., Deeg, D. J. H., Van Balkom, A. J. L. M., Smit, J. H., De Beurs, E., et al. (1998). Anxiety disorders in late life: A report from the Longitudinal Aging Study Amsterdam. *International Journal of Geriatric Psychiatry*, *13*, 717–726.

Gnann, J. W., Jr., & Whitley, R. J. (2002). Herpes zoster. *New England Journal of Medicine*, *347*(5), 340–346.

Hirsh, J., Warkentin, T. E., Shaughnessy, S. G., Anand, S. S., Halperin, J. L., Raschke, R., et al. (2001). Heparin and low-molecular-weight heparin mechanisms of action, pharmacokinetics, dosing, monitoring, efficacy, and safety. *Chest*, *119* (1 Suppl.), 64S–94S.

Wells, P. S., Anderson, D. R., & Ginsberg, J. (2000). Assessment of deep vein thrombosis or pulmonary embolism by the combined use of clinical model and noninvasive diagnostic tests. *Seminars Thrombosis Haemostasis*, *26*(6), 643–656.

Wetherell, J. L., Hopko, D, R., Diefenbach, G. J., Averill, P. M., Beck, J. G., Craske, M. G., et al. (2005). Cognitive-behavioral therapy for late-life generalized anxiety disorder: Who gets better? *Behavior Therapy*, *36*(2), 147–156.

CHRONIC HEART FAILURE IN THE ELDERLY

Definition and Scope of Problem

Heart failure (HF) is a clinical syndrome in which the heart fails to adequately fill or eject blood, resulting in fluid retention and low cardiac output. Resulting symptoms include dyspnea, orthopnea, fatigue, and exercise intolerance; less commonly recognized symptoms include poor cognitive function, poor circulation, and post-prandial gastric "angina," indicating inadequate perfusion to vital organs. Other symptoms include anorexia and early satiety from gut and liver congestion, which can also result in malabsorption of medications. It is important to recognize that common diseases such as hypertension, atrial fibrillation, and chronic renal insufficiency can precipitate an HF syndrome in patients with mild and asymptomatic cardiac dysfunction.

HF is common among the elderly. After the age of 65, the incidence of HF is nearly 10 per 1,000, and 80% of patients hospitalized for HF are more than 65 years old (Masoudi, Havranek, & Krumholz, 2002). The Cardiovascular Health Study (CHS) (Gottdiener et al., 2000) was an important multicenter observational study of 5,888 patients older than 65 years who did not already have a diagnosis of HF. The CHS demonstrated that uncontrolled hypertension, diabetes mellitus, and atrial fibrillation were major risk factors for developing HF, and patients who developed HF had preserved to nearly preserved left ventricular (LV) function. Of these patients, 45% died within 6 to 7 years; women outnumbered men who manifested an HF syndrome in the setting of preserved or nearly preserved LV function. The key finding is that elderly patients more commonly have diastolic dysfunction—stiff hearts with impaired filling but preserved emptying. The derangement in filling results in low cardiac output or poor forward flow with attendant "backward congestion" of the left atrium resulting in pulmonary congestion, which can become severe in the setting of atrial tachyarrhythmias (e.g., atrial fibrillation). In patients with diastolic dysfunction, treatment strategies are less defined and the hemodynamic profiles more complex. Elderly patients are poorly represented in major clinical trials evaluating the safety and efficacy of HF therapies, and data suggest that elderly patients may have altered responses to standard therapies such as diuretics and angiotensin converting enzyme inhibitor (ACEI) therapy (Cody, Torre, Clark, & Pondolfino, 1989). Finally, there remains a veil of "therapeutic nihilism" regarding aggressive cardiac care for elderly patients.

Diagnosis

Diagnosis of HF begins with a clinical history and physical, with confirmatory evidence of cardiac dysfunction on the echocardiogram. Echocardiography has historically been useful to diagnose systolic dysfunction, but more sophisticated techniques of measuring LV filling and myocardial wall stiffness help diagnose diastolic dysfunction. When ordering an echocardiogram, it is important to specifically request a "Doppler" diastolic assessment, or the diagnosis may be missed.

Once a diagnosis of HF has been made, it is important to characterize the degree of impairment using the standardized New York Heart Association (NYHA) Classification System (http://www.americanheart.org/presenter.jhtml?identifier=1712), as follows:

- Class I: Asymptomatic heart disease. Ordinary activity causes no undue fatigue, dyspnea, palpitations, or chest pain.
- Class II: Minimally symptomatic heart disease.
- Class III: Markedly symptomatic heart disease. Less than ordinary activity causes fatigue, dyspnea, palpitations, or chest pain, but patient is comfortable at rest.
- Class IV: Ordinary activity reliably causes marked discomfort. Symptoms of angina or heart failure are present at rest.

It is also appropriate to characterize the patient's hemodynamic profile. Hemodynamic profiling means describing whether a patient is literally "wet or dry" and then whether the patient is "warm or cold." These descriptors assist in communicating key information about patients to other health care professionals. Hemodynamic profile assessment also helps clarify the pathophysiology of the symptoms so that appropriate treatment can be provided. Patients who are "wet and warm" are patients with congestion/volume overload but who have normal or elevated blood pressure (BP) and adequate perfusion to vital organs and extremities. These patients require a primary diuresis strategy. In contrast, patients who are "cold and wet" may be confused, with cold extremities, marginal BP, and decreased urine output but who are also dyspneic with rales on lung exam. In this scenario, the treatment strategy is to "warm up before drying out," meaning that a vasodilator or inotropic strategy should be used first to increase end-organ perfusion (especially to the kidneys) before initiating diuresis.

Brain natriuretic peptide (BNP) levels effectively describe a patient's volume status in objective terms. BNP is a neurohormone secreted by the LV in the setting of high filling pressures. It is a simple blood test that can indicate whether a patient's dyspnea is secondary to cardiac congestion. In some situations, the BNP does not accurately reflect the LV filling pressures (e.g., obesity), but it generally is a valuable test used to confirm a diagnosis of decompensated HF.

Medical Therapy for Systolic Dysfunction

Digoxin, or foxglove, is the oldest medication used for congestive HF. There is controversy regarding its modern-day efficacy. The Digitalis Investigation Trial (DIG Trial) demonstrated a significant decrease in hospitalization but only a trend toward decreased mortality with the use of digoxin for patients with symptomatic HF (DIG, 1997). Multiple trials endorse the use of ACEI in symptomatic or asymptomatic LV dysfunction, with significant decreases in morbidity and mortality (CONSENSUS, 1987; SOLVD, 1991; SOLVD, 1992). Treatment doses that effectively improve symptoms and mortality are the highest dose tolerated. It is not enough to prescribe a low-dose ACEI (ATLAS, 1999). For patients who cannot tolerate ACEI secondary to cough (5% to10% of patients experience this side effect) or angioedema, angiotension receptor blockers (ARBs) may be substituted. Some data suggest that angioedema to ACEI may herald the same side effect from ARB therapy, so this substitute must be monitored carefully. The beta-blockers carvedilol, bisoprolol, and metoprolol succinate significantly improve morbidity and mortality, but they must be used with caution. Beta-blockers must only be initiated when the patient has been diuresed to euvolemia. Their mechanism blocks high sympathetic tone in the setting of impaired myocardial performance, but they also have substantial negative inotropic effects and can precipitate an episode of HF if the patient is still volume-overloaded. Patients with conduction-system disease/heart block must use beta-blockers cautiously. Occasionally, permanent pacemakers are placed so that maximal uptitration of beta blockers can occur without concern for complete heart block and risk of falls.

Diuretics are essential in managing patients with HF. Impaired myocardial performance activates the renin-angiotensin-aldosterone system, which signals the kidneys to retain sodium and water. ACEI, ARB, and aldosterone antagonist medications interrupt this hormonal system, but diuretics are the only effective medicine for fluid removal and maintenance of the euvolemic state. Patients with mild HF can be managed with thiazide diuretics (e.g., HCTZ), whereas patients with more severe congestion require loop-diuretic therapy (e.g., furosemide). The appropriate dose of a loop diuretic is achieved when it takes 30 minutes to 1 hour to urinate after taking the medication (i.e., urinary threshold). If the urinary threshold is well beyond this, the dose should be doubled. An increased urinary threshold may indicate gut congestion and malabsorption of medications, and a temporary doubling of diuretic may be required to return to a euvolemic state.

Diuretics can cause excessive volume depletion and pre-renal azotemia, as well as hypokalemia and hypomagnesemia, which can precipitate serious arrhythmias. Potassium and magnesium supplementation may be required. Initiation and adjustment of diuretic doses require monitoring electrolytes and renal function closely. The HF specialist and patient or caregiver must be in close communication. Charting symptoms, vital signs, weight, medication adjustments, and recent laboratory values is essential. The medical record of a patient with HF combines data taken in the office, over the telephone, and what is documented at home.

Finally, the aldosterone antagonist, spironolactone, has been found to improve morbidity and mortality in patients with NYHA Class III and Class IV HF. Spironolactone blocks the action of aldosterone on the renal tubules; this allows for additional diuresis but is potassium-sparing because it directly inhibits potassium excretion in the kidney. It also may inhibit myocardial fibrosis and preserve diastolic function. This medication can be effective combined with a loop diuretic, with a more robust diuretic effect without hypokalemia. Spironolactone is contraindicated in patients with renal insufficiency and baseline hyperkalemia. Initiation and uptitration of spironolactone should be followed by surveillance of serum potassium.

Medical Therapy for Diastolic Dysfunction

Impaired filling of the heart is as significant and prevalent a problem as systolic dysfunction, with an only slightly better prognosis (Aurigemma & Gaasch, 2004). Therapies for patients with diastolic dysfunction include a low-sodium diet with fluid restriction, typically 2 grams and 2 liters per day, respectively. Normal sinus rhythm should be maintained, as atrial arrhythmias can precipitate pulmonary congestion. Hypertension should be controlled to decrease wall stress on the heart muscle and prevent myocardial fibrosis and impair relaxation. Therapies include ACEI or ARBs to treat HTN; these medications also reverse LV hypertrophy and myocardial fibrosis. Beta-blockers can control heart rate and rhythm, but there is no evidence that they preserve diastolic function. Digoxin is not recommended for patients with diastolic dysfunction unless they have atrial fibrillation. Calcium channel blockers are effective in controlling heart rate and enhancing myocardial relaxation and therefore diastolic filling but, to date, they have not been shown to improve morbidity and mortality.

Diet, Exercise, and the Self-Care Model

Despite the prevalence of HF, many patients know remarkably little about its pathophysiology, rationale for drug therapy, the importance of a low-sodium diet and fluid restriction, and how to manage their diuretics independently. A key component to managing patients with HF is to teach patients and caregivers how the medicines work and how they can adjust diuretics at home based on symptoms and signs such as weight gain. Toward this end, "Home Check Lists and Charts" are valuable parts of the medical records. As patients and caregivers chart trends, they can better communicate with the physician when there is a suspected decompensation. Use of charts to monitor trends also teaches patients and caregivers to anticipate a decompensation and adjust diuretics before the patient becomes too unstable to remain at home. Specific data that should be recorded by the home-care team and communicated to the HF team include daily weights, vital signs, fluid and sodium intake, symptoms of dyspnea, and inability to perform an activity of daily living. The home-care team should also record any interventions such as doubling the diuretic for a day.

Clinical Pearls

- Most patients with chronic HF do not have crackles on lung exam despite markedly elevated LF filling pressures.
- Digoxin levels should be subtherapeutic when used to treat systolic dysfunction. Levels should be in the therapeutic range only when treating concomitant atrial fibrillation.
- Low-impact aerobic exercise is beneficial for patients with HF.
- Delirium in a patient with HF may indicate severe and life-threatening hyponatremia secondary to vasopressin mediated water retention.
- Increased urinary threshold may signal a congested gut and also a warning that other medications may not be adequately absorbed.
- Infection can cause decompensation of HF.
- Congestion and volume overload can cause liver congestion with a decline in production of coagulation factors. For patients on warfarin therapy, levels can become dangerously high.

MARYJANE FARR
MARIA SPINELLI

See also

Chest Pain: Noncardiac Causes
Cough
Dyspnea
Heartburn

Internet Resources

American Heart Association
http://www.americanheart.org

Heart Failure Society of America
http://www.hfsa.org

National Heart, Lung, and Blood Institute
http://www.nlibi.gov

New York Heart Association
http://www.americanheart.org/presenter.jhtml?identifier=1712

Patient Resource
http://www.patientlinx.com

REFERENCES

ATLAS (1999). Comparative effects of low and high doses of the ACEI lisinopril on morbidity and mortality in chronic heart failure. *Circulation*, *100*, 2312–2318.

Aurigemma, G. P., & Gaasch, W. H. (2004). Diastolic heart failure. *New England Journal of Medicine*, *351*, 1097–1105.

Cody, R. J., Torre, S., Clark, M., & Pondolfino, K. (1989). Age-related hemodynamic, renal and hormonal differences among patients with congestive heart failure. *Archives of Internal Medicine*, *149*,1023–1028.

CONSENSUS: The Cooperative North Scandanavian Enalapril Survival Study Group (1987). Effects of enalapril on mortality in severe CHF. *New England Journal of Medicine*, *316*, 1429–1435.

DIG (The Digitalis Investigation Group) (1997). The effect of digoxin on mortality and morbidity in patients with heart failure. *New England Journal of Medicine*, *33*, 525–533.

Gottdiener, J. S., Arnold, A. M., Aurigemma, G. P., Polak, J. F., Tracy, R. P., Kitzman, D. W., et al. (2000). Predictors of congestive heart failure in the elderly: The Cardiovascular Health Study. *Journal of the American College of Cardiology*, *35*, 1628–1637.

Masoudi, F. A., Havranek, E. P., & Krumholz, H. M. (2002).The burden of chronic congestive heart failure in older persons: Magnitude and implications for policy and research. *Heart Failure Reviews*, *7*, 9–16.

SOLVD (1991). Effect of enalapril on survival in patients with reduced ventricular ejection fraction and congestive heart failure. *New England Journal of Medicine*, *325*, 293–302 (editorial 351–353).

SOLVD (1992). Prevention: Effect of enalapril on mortality and the development of heart failure in asymptomatic patients with reduced left ventricular ejection fraction. *New England Journal of Medicine*, *327*, 685–691.

CHRONIC ILLNESS

Chronic illnesses are treatable conditions but, by definition, cannot be completely cured. These illnesses frequently lead to disability and require ongoing management that is shared by the patient, his or her health care professionals, and/or caregivers. Of Americans aged 65 years and older, 88% have at least one chronic illness; one-quarter have four or more chronic conditions (Bodenheimer, Wagner, & Grumbach, 2002). Arthritis, hypertension, heart disease, and hearing impairment are among the most prevalent chronic conditions seen in older, noninstitutionalized persons in the United States (Cobbs, Duthie, & Murphy, 1999–2001). Vision impairment, diabetes mellitus, and mental health problems, including dementia, are also prevalent disorders.

In a health care system geared toward providing acute care, chronic-illness care is expensive: indeed, about 80% of Medicare's resources are spent on treating chronic illness (Partnership for Solutions, 2001). In response, the Centers for Medicare and Medicaid Services are investigating how disease-management models can reduce costs.

Chronic illness causes physical, mental, and functional impairment, which significantly influences an individual's independence, friends and family, social status, financial stability, physical comfort, and/or the ability to engage in meaningful pursuits. Health care professionals can help meet the needs of patients requiring chronic-illness care through a variety of approaches.

Develop a team approach. To adequately respond to the needs of those with chronic illnesses, an interdisciplinary team is required, consisting of a physician, nurse, social worker, and specialists as needed (e.g., occupational therapist, physical therapist, nutritionist, psychiatrist, neuropsychologist, and pharmacist). Utilization of a case (or care) manager in private practice or affiliated with a home-care or social-service agency can be particularly helpful for complicated cases. Elder lawyers have a role in financial asset planning, navigating clients through Medicare and insurance matters, and helping with other legal and financial issues that can accompany chronic illness. Good communication, trust, and a strong partnership between the patient and individual health professionals who comprise the team are crucial.

Educate health professionals. Professionals need to appreciate the multidimensional impact chronic disease has on older adults. Creative educational programs are now being integrated into graduate, doctoral, and medical school curricula throughout the United States. The Donald W. Reynolds Foundation, for example, has funded medical schools to undertake comprehensive programs to strengthen the geriatrics training of medical students, residents, and practicing physicians. In addition to supporting the training of physicians in academic geriatric medicine, the John A. Hartford Foundation has provided significant resources to increase knowledge among social workers and nurses in geriatrics health and mental health care. Innovative web-based resources are also being developed to educate health professionals and provide practical resources for them to become more effective and efficient in working with older patients with chronic illness.

Conduct a thorough assessment. The professional team's degree of involvement with the patient, family, and/or other caregivers depends on the seriousness of the illness and its impact on the patient's function and quality of life. An assessment of the following issues serves to guide the development of intervention strategies.

Medical Assessment

Disease onset, diagnosis, and certainty. Was the disease onset rapid or gradual? Was it life-threatening, debilitating, or merely annoying? What impact does the diagnosis have on the patient? Is the diagnosis definitive or is there a possibility for better or worse news?

Disease course, pain, and familiarity. Will the patient stabilize, improve, or worsen with time? What is the potential for the patient's increased self-reliance? Should the onset of significant pain be anticipated? What preparations do the patient and family need to make to provide future care?

Other acute and chronic illnesses. Is the patient already suffering from acute or chronic illness? If so, what is the anticipated effect of the additional health problems on the patient's overall quality of life and well-being? Will newly prescribed medicine interfere with current prescriptions or complicate the patient's current medical condition?

Treatment and pain management. Will the patient require surgery, medications, physical therapy or other rehabilitation, a home health aide, psychotherapy, exercise program, or a new diet regimen? Is polypharmacy an issue? Are appropriate medications being utilized at proper doses? Does the patient have the motivation, desire, and ability to proceed with the recommended interventions? Is palliative care an option?

End-of-life care. Is the end of life approaching? Are advance directives in place? Have the patient's wishes about end-of-life care been discussed? Have these wishes been communicated by the patient to the designated health care agent? How will the patient's wishes be translated into medical intervention?

Functional Assessment

Functional status. What is the patient's overall functional ability as determined by assessing activities of daily living (ADL) and instrumental ADL (IADL)?

Restrictions. What areas of life will be changed, including mobility, diet, cognitive function, employment, and self-care?

Service site. Where will care be provided? If the patient is homebound, are the needed heath care services obtainable at home?

Environmental obstacles. Would environmental modifications in the home improve the patient's function, quality of life, and safety?

Health literacy. How will the patient's level of health literacy affect the reporting of symptoms and the ability to adhere to the health professionals' recommendations?

Psychosocial Assessment

Cognitive and emotional status. Do the patient and/or caregiver understand the disease, likely progression, associated problems, and treatment recommendations? Does the patient have the cognitive capacity to adapt to lifestyle changes, restrictions, and make health care decisions? Is there evidence of depression, suicidal ideation, anxiety, or alcohol/drug abuse?

Social stigma. Is the patient feeling ashamed about the illness or functional impairment? Is the patient isolated due to shame about functional loss (e.g., having to rely on a wheelchair or walker?)

Community resources. Would medical day care, respite services, transportation services, friendly visitors, care management, and/or psychotherapy be helpful?

Social supports. Does the patient have a sufficient network of friends and family willing and able to provide emotional and instrumental support with the patient's daily needs? Are they experiencing caregiver stress? Is additional support needed?

Financial status. Are financial resources sufficient to cover health care needs and services? Does the patient have the cognitive capacity to manage finances? Has someone been designated power-of-attorney or guardian?

Religious, spiritual, and cultural status. Is there something the provider should know about the patient's spiritual life or health beliefs in order to provide the best possible care? Is there a role for chaplaincy? Is there a need for an interpreter to overcome language barriers?

Provide multipronged interventions. The following interventions should aim to optimize the patient's functional independence, improve social connections, and advance the patient's comfort and well-being.

Prevention Interventions

Provide prevention and early-detection services. Primary prevention includes health-promotion practices that can delay dependency, such as nutritional support, smoking cessation, home safety modifications, exercise, and immunization. Secondary prevention is screening for diseases such as diabetes, hypertension, breast cancer, colon cancer, glaucoma, and depression. Tertiary prevention includes patient support, education, monitoring, and rehabilitation in an effort to forestall further health and functional decline in individuals already diagnosed with a chronic illness.

Medical Interventions

Medical and surgical services. The intervention focus is on care—symptom management and relief, function, and quality of life—not cure. The nurse frequently has a pivotal role in caring for the patient and coordinating and monitoring medical services. Conveying an unwavering commitment to the patient of continuing quality care and concern in the face of no cure is critical.

Education and disease monitoring. Patients, family members, and other caregivers usually need education about the illness and require training in the use of equipment and medication administration. Education is frequently provided by a nurse, is usually disease-specific, and may be ongoing, requiring reminders and review. Attention must be paid to any language and literacy barriers in conveying this information.

Palliative care. Palliative care focuses on relief of symptoms and is important at any stage of a chronic illness. Health professionals need to be clear about advance directives and to make certain there is concordance between the patient's wishes and the health care agent's understanding of these wishes. Providers should be able to offer guidance and options to their patients, including hospice care and other end-of-life options.

Functional Interventions

Rehabilitation. Based on the patient's medical problems, physical limitations, potential for rehabilitation, and participation readiness, physical therapists, occupational therapists, and speech and swallow therapists may work with the patient to set realistic short- and long-term rehabilitation goals. Rehabilitation therapy enables patients to restore function as well as prevent further deterioration.

Environmental adaptations. User-friendly environments for those with disabilities may include simple and low-cost interventions such as grab bars, improved lighting, and wheelchair-accessible counters.

Psychosocial Interventions

Social services and mental health services. Social workers play a pivotal role in providing services once problems are identified. For example, social workers can help patients acknowledge the difficulties arising from a functional loss, grieve that loss, and learn to utilize remaining capabilities.

Financial and legal assistance. Clinicians need to discuss financial solutions with patients and family for whom financial problems prohibit medical adherence. Financially qualified patients may find substantial discounts through drug manufactures' Patient Assistance Programs (PAPs) or discount cards. Pharmacists and social workers are also excellent resources for finding less expensive options for medication (i.e., helping patients make an appropriate choice in the Medicare Part D Drug Plan). Social workers and nurses are often involved in recognizing new or unresolved financial and legal problems and bringing them to the attention of team members for discussion and resolution.

Social support. Social supports are crucial to preventing loneliness, depression, and premature cognitive decline. Providers should work to preserve patients' present relationships and seek to help them expand their social networks if these have diminished. Individual and/or family counseling services may be effective interventions to help relieve the emotional distress associated with social isolation and to help patients strategize ways of increasing social integration. When feasible, services offered in a group-related format may be particularly conducive to lessening social isolation. In addition, consider respite, counseling, and other support services for caregivers.

Risa Breckman
Ronald D. Adelman
Niall Monaghan

See also

Coping with Chronic Illness
Multidimensional Functional Assessment: Overview
Health Maintenance

Internet Resources

Family Caregiver Alliance
http://www.caregiver.org

Cornell Cares
http://www.cornellcares.com

Environmental Geriatrics
http://environmentalgeriatrics.org

Improving Chronic Illness Care, Robert Wood Johnson Foundation
http://www.improvingchroniccare.org

Partnership for Solutions, The Johns Hopkins Bloomberg School of Public Health
http://www.partnershipforsolutions.com

POGOE: Portal of Geriatric Online Education
http://www.pogoe.org

REFERENCES

Bodenheimer, T., Wagner, E. H., & Grumbach, K. (2002). Improving Primary Care for Patients with Chronic Illness. *Journal of the American Medical Association*, *288*, 1775–1779.

Cobbs, E. L., Duthie, E. H., & Murphy, J. B. (1999–2001). *Geriatrics Review Syllabus: A Core Curriculum in Geriatric Medicine* (4th ed.). New York: American Geriatrics Society.

Partnership for Solutions. Available at http://www.partnershipforsolutions.org/statistics/coverage.html

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality in the elderly. The effect of COPD on our aging American population is significant. Although likely underdiagnosed, COPD is the fourth leading cause of morbidity and mortality in the United States and it is expected to be the fifth highest contributor to worldwide disease burden by 2020 (Murray & Lopez, 1997).

The most recently accepted definition of COPD is that set forth by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) project. This collaboration of the National Heart, Lung, and Blood Institute (NHLBI) and the World Health Organization (WHO) defines COPD as "a disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases" (Pauwels, Buist, Calverley, Jenkins, & Hurd, 2001). This definition does not include the classic distinction between "pink puffers" (i.e., individuals with emphysema dominating the COPD syndrome) and "blue bloaters" (i.e., individuals with chronic bronchitis dominating) but rather considers emphysema and chronic bronchitis as varying manifestations of the same disease process. The GOLD staging is based on level of airflow obstruction, specifically post-bronchodilator FEV1 (i.e., forced expiratory volume in 1 second), and is aimed at standardizing the diagnosis and treatment of COPD.

The pathogenesis of COPD is thought to be due to the combination of damage from inflammatory cells (i.e., macrophages, CD8+ T-lymphocytes, and neutrophils) and their mediators, oxidative stress, and an imbalance between proteinases and antiproteinases. Pathologic changes are seen in the large and small airways, parenchyma and vasculature in the form of enlarged mucus-secreting glands and increased goblet cells, airway remodeling, centrilobular emphysema, and thickened vessel walls.

Risk factors for the development of COPD can be divided into host factors, such as the hereditary deficiency of α1-antitrypsin, and environmental factors, such as tobacco smoke. In the United States, 80% of COPD cases are attributed to cigarette use. The genetic and other host factors that predispose some smokers but not all to the development of COPD are still being elucidated.

Diagnosis

The symptoms of COPD can vary from mild dyspnea only on exertion or during periods of respiratory infection; to chronic, productive cough; to severe, persistent, and gradually worsening shortness of breath. In advanced cases, there can be loss of muscle mass and weight loss, morning headache due to nighttime hypercapnea, and hemoptysis from either chronic bronchitic airway irritation or bronchogenic carcinoma.

According to the GOLD criteria, a diagnosis of COPD requires the presence of airflow obstruction on pulmonary-function testing with or without the presence of symptoms. This airflow obstruction is defined as an FEV1 to FVC (i.e., forced vital capacity) ratio of less than 70%, and its severity is staged based on the FEV1. Other evidence of COPD on lung-function testing is the presence of a supernormal total lung capacity (TLC) and residual volume (RV), suggesting hyperinflation and air-trapping. There may be physical signs that support the diagnosis, such as a prolonged expiratory phase, hyperinflated thorax with an increased anterior to posterior diameter, the use of pursed-lip expiration, or evidence of right-sided heart failure. Plain chest radiography is insensitive for the diagnosis of COPD. In late stages, hyperinflation can be seen with enlarged lung fields, flattened diaphragms, and right-ventricular hypertrophy. High-resolution-chest-computed tomography is more specific and, especially with high-resolution technology, can demonstrate pathological emphysema and the airway thickening of chronic bronchitis.

Treatment

Therapy for COPD focuses on the modification of risk factors, the alleviation of symptoms, and the prevention and management of acute exacerbations. There is no pharmacotherapy that has been shown to halt the decline in FEV1 over time, but smoking cessation, especially if accomplished before debilitating airflow obstruction develops, can decrease the yearly rate of FEV1 decline (Fletcher & Peto, 1977).

Management of stable COPD should follow a stepwise approach. Any patient with airflow obstruction with or without symptoms should avoid risk factors (i.e., smoking), receive a yearly influenza vaccine, and have a short-acting bronchodilator inhaler to use as needed. Those with moderate COPD (i.e., FEV1 between 50% and 80% of expected) should also be prescribed a long-acting bronchodilator to be taken daily in addition to the as-needed short-acting agent. Those with severe COPD (i.e., FEV1 between 30% and 50% of expected) may benefit from the addition of an inhaled steroid to this regimen. Although not effective in improving FEV1, improved dyspnea and less frequent exacerbations have been noted with the use of inhaled steroids in this group. Finally, those with very severe COPD (i.e., FEV1 less than

30% of expected) and who have either chronic hypoxemic respiratory failure or right-sided heart failure should receive chronic oxygen therapy. This not only brings symptomatic relief of dyspnea on exertion but also improves pulmonary hemodynamics and has been shown to have a significant mortality benefit. Safe administration of oxygen therapy necessitates measurement of an arterial blood gas to quantify the degree of carbon-dioxide retention or hypercapnea because aggressive correction of hypoxia in these individuals may lead to respiratory arrest.

Although there is no clear evidence to support the use of mucolytic agents or cough suppressants, pulmonary rehabilitation has been shown to improve quality of life, dyspnea, and exercise tolerance and to reduce the number of hospitalizations in patients with moderate to severe COPD. There is no benefit to the use of chronic, systemic corticosteroids in patients with COPD. Finally, patients with predominantly upper-lobe bullous disease, a low exercise tolerance, but an FEV1 greater than 20% of predicted should be considered for lung-volume-reduction surgery. Those with cor pulmonale and respiratory failure should be considered for lung transplantation.

An acute exacerbation of COPD is defined as worsening respiratory function or increased frequency of cough with more sputum production. Often, an exacerbation is triggered by either a viral or bacterial respiratory tract infection, but myocardial infarction, aspiration, pulmonary embolism, and pneumothorax must be eliminated as causes of the discrete worsening. In addition to increased bronchodilators and oxygen, if appropriate, antibiotics are recommended if the exacerbation is characterized by a change in the quality or quantity of sputum production or if there is radiographic evidence of a lower respiratory tract infection. There is evidence that a short course of systemic steroids, initiated early in the course of an exacerbation, will modestly reduce the length of time spent in the hospital and prevent early relapse (Singh, Palda, Stanbrook, & Chapman, 2002). Patients not improving with these measures and who remain in respiratory failure may benefit from a trial of noninvasive ventilation such as Bipap to avoid intubation and shorten their exacerbation course.

Current research in COPD aims to identify the genetic factors that predispose only some cigarette smokers to disease and to further elucidate the involved inflammatory mediators. Such knowledge will help in the prevention and treatment of COPD and ease the burden of this disease on our aging population.

DANA ZAPPETTI

Acknowledgments
This work was supported, in part, by the Will Rogers Memorial Fund, Los Angeles, CA.

See also
Chest Pain: Noncardiac Causes
Cough

Internet Resources

American Thoracic Society
http://www.thoracic.org

American College of Chest Physicians
http://www.chestnet.org

National Institute of Health Web site with physician-education links and resources
http://www.health.nih.gov

Official report of the GOLD committee on COPD
http://www.GOLDCOPD.com

REFERENCES

Fletcher, C., & Peto, R. (1977). The natural history of chronic airflow obstruction. *British Medical Journal*, *25*(1), 1645–1648.

Murray, C. J., & Lopez, A. D. (1997). Alternative projections of mortality and disability by cause 1990–2020: Global Burden of Disease Study. *Lancet*, *349*, 1498–1504.

Pauwels, R. A., Buist, A. S., Calverley, P. M., Jenkins, C. R., & Hurd, S. S. (2001). GOLD Scientific Committee. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. NHLBI/WHO Global Initiative for Chronic Obstructive Lung Disease (GOLD) Workshop summary. *American Journal of Respiratory and Critical Care Medicine*, *163*, 1256–1276.

Singh, J. M., Palda, V. A., Stanbrook, M. B., & Chapman, K. R. (2002). Corticosteroid therapy for patients with acute exacerbations of chronic obstructive pulmonary disease: A systematic review. *Archives of Internal Medicine*, *162*, 2527–2536.

CLINICAL PATHWAYS

Evidence-based practice and collaboration among professionals are essential elements of today's health care environment. Clinical pathways, or care guidelines, are tools that promote collaboration among clinicians who plan and implement care for a variety of patients, using the best evidence to support practice. Pathways are often created by interdisciplinary teams, including physicians, nurses, social workers, therapists, and nutritionists, for patients in hospital or community settings such as home care or primary care clinics. Patients with chronic illness benefit from disease-management programs that provide guidelines for the entire continuum of care for the duration of the illness. Older adults benefit when pathways incorporate elder-specific care into the plan.

Current research on clinical pathways shows that patient outcomes can be improved when care processes are standardized. This is particularly notable for hospitalized older adults, who are at risk for complications and extended hospitalization. Hip fractures are common injuries in the elderly and are associated with considerable morbidity and mortality. Clinical pathways for patients with hip fractures have demonstrated reduced length of stay and improved 1-year mortality (Koval, Chen, Aharonoff, Egol, & Zuckerman, 2004). Pathways for reducing post-operative length of stay and promoting adherence to pneumonia guidelines have also been shown to improve care delivered to these patients (Dy et al., 2003; Hauck, Adler, & Mulla, 2004).

Focusing clinical resources where and when they are needed is one advantage that pathways provide patients because the required care can occur more efficiently when the health care team works collaboratively and care is provided on time. A program for patients with joint replacements at Vancouver General Hospital expedites recovery and minimizes complications by using a continuum model pathway that begins preoperatively and spans the continuum of care (MacDonald, Arthur, & Parent, 2005).

Clinical pathways can serve as a general guide to care and ensure that the best standard of care is applied to all patients. For example, the American College of Cardiology/American Heart Association heart-failure guidelines are commonly used to support processes of care for patients with heart failure. These guidelines were used as a foundation for pathways developed in a community setting and reported a reduction in the rate of rehospitalization but an increased number of home health visits to reach pathway goals (Dykes et al., 2005).

Clinical pathways help to organize care delivered by various members of an interdisciplinary team and may address segments of disease progression, such as end-of-life issues. A palliative-care clinical pathway was developed for older adults experiencing end-of-life care. Implementation of the end-of-life pathway improved care of dying inpatients by increasing documentation of goals and plans of care, improving symptom assessment and management, and decreasing interventions at the end of life (Bookbinder et al., 2005).

Pathways should incorporate assessments specific to the older adult, thus focusing all clinicians on the needs of hospitalized or community-dwelling older adults. Being alert to the possibility of confusion, unsteady gait, and incontinence can help clinicians better plan for possible problems before they become complications.

Postdischarge pathways for the care continuum are essential to keep older adults from experiencing unnecessary hospital readmission. Although patients are expected to reach such clinical milestones as ambulating or being able to eat their usual diet by the time of discharge, older adults often require additional care in their homes. Home health nurses are significant contributors to ensuring continuation of the plan, particularly with regard to assisting older adults with activities of daily living or teaching self-medication skills. A continuum pathway that is focused on the specific needs of an older adult patient with heart failure, for example, may emphasize initial skills during hospitalization such as learning medication routines, self-managing diet, and monitoring weight daily.

Clinical pathways offer clinicians an opportunity to outline key processes that must occur for patients to move safely through the continuum of care. Pathways for older adults should address all sites at which care is delivered, from hospitalization to rehabilitation to long-term care to home. This continuum approach promotes communication and collaboration among caregivers and ensures that elder-specific care is delivered with a focus on quality.

Kimberly S. Glassman
Linda Valentino

See also

Case Management
Discharge Planning
Medicare Managed Care

Internet Resources

American Case Management Association
http://www.acmaweb.org/

Case Management Society of America
http://www.ccm.org

Case Manager's Resource Guide
http://www.cmrg.com/

Center for Case Management
http://www.cfcm.com

The Regional Geriatric Program of Toronto
http://caremapsforseniors.ca/

REFERENCES

Bookbinder, M., Blank, A. E., Arney, E., Wollner, D., Lesage, P., McHugh, M., et al. (2005). Improving end-of-life care: Development and pilot-test of a clinical pathway. *Journal of Pain and Symptom Management*, *29*(6), 529–543.

Dy, S. M., Garg, P. P., Nyberg, D., Dawson, P. B., Morlock, L., Pronovost, P. J., et al. (2003). Are critical pathways effective for reducing postoperative length of stay? *Medical Care*, *41*(5), 637–648.

Dykes, P. C., Acevedo, K., Boldrighini, J., Boucher, C., Frumento, K., Gray, P., et al. (2005). Clinical practice guideline adherence before and after implementation of the HEARTFELT (HEART failure effectiveness & leadership team) intervention. *Journal of Cardiovascular Nursing*, *20*(5), 306–314.

Hauck, L. D., Adler, L. M., & Mulla, Z. D. (2004). Clinical pathway care improves outcomes among patients hospitalized for community-acquired pneumonia. *Annals of Epidemiology*, *14*(9), 669–675.

Koval, K. J., Chen, A. L., Aharonoff, G. B., Egol, K. A., & Zuckerman, J. D. (2004). Clinical pathway for hip fractures in the elderly: The hospital for joint diseases experience. *Clinical Orthopaedics and Related Research*, *425*, 72–81.

MacDonald, V., Arthur, B., & Parent, S. (2005). The Vancouver General Hospital joint replacement rapid recovery program: Optimizing outcomes through focused pathways. *Journal of Orthopaedic Nursing*, *9*(2), 95–102.

COGNITION INSTRUMENTS

Owing to an aging population, dementia is more prevalent. The incidence of dementia increases with age, doubling every 5 years after age 65 until age 85, when the incidence reaches 50%. Early detection can yield substantial treatment due to new agents that slow cognitive deterioration. Testing instruments can help clinicians screen, detect, and monitor cognitive deterioration.

Dementia is a progressive, global, cognitive impairment involving memory, language, visual-spatial ability, executive function, and praxy. Of dementia's many varieties, Alzheimer's disease (AD) is the most common. Although many dementias are irreversible, some are treatable and even partially reversible, such as B_{12} deficiency and ETOH abuse. In the early stages of dementia, a range of etiologies prompts various clinical presentations, each demonstrating a distinct set of deficits. For example, AD affects the temporal lobe first and impairs memory; vascular dementia (VaD) provokes a variety of symptoms depending on the affected regions of the brain. Parkinson's disease and other subcortical dementias have an early impact on the frontal lobe. Specific instruments are required to differentiate these conditions. Not all instruments assess functioning with equal accuracy, sensitivity, and reliability.

Ideally, primary care providers should screen persons older than age 65 for cognitive deficits annually. However, any trained health care professional can administer the instruments discussed herein. With limited practitioner time, instruments must be sensitive, specific, valid, reliable, easy to administer, and brief. The most commonly used instruments, indications for their use, and criteria to determine when further testing is indicated are described herein.

Preparation for Testing

To interpret tests meaningfully and assess a dementia's etiology, the clinician must obtain from the patient (and, if possible, a collateral) a detailed clinical history that is sufficiently thorough to identify sensory impairments that can alter test performance. Collateral information is helpful when evaluating activities of daily living (ADL) and instrumental ADL (IADL). Absent a collateral to corroborate history, the clinician must carefully observe the person's grooming; hygiene; appropriateness of clothing to the weather; state of nourishment; capacity to understand and follow medical recommendations; medication adherence; and regular attendance to appointments, tests, and follow-ups.

Accurate evaluation of a patient's performance requires understanding the patient's cultural and ethnic background, primary language, education level, employment history, and overall pre-morbid functioning. Education level, for instance, can alter the cut-off points of certain instruments. Some tests display greater cultural biases than others, yielding uneven accuracy levels across populations.

Depression and pain can have an impact on performance and test results. Clinicians need to be meticulous and cautious: Even with substantial impairment, a patient can maintain social skills and present surprisingly well—at least, superficially.

Screening Instruments

All cognitive-impairment screening instruments evolved with research in mind. Key attributes and limitations of the most commonly used instruments are discussed in this section.

Mini-Mental State Exam

The Mini-Mental State Exam (MMSE) by Folstein, Folstein, and McHugh (1975) is the best known and best studied of all mental-status instruments. The MMSE involves 22 questions to measure orientation, spatial ability, immediate memory, short-term recall, calculations, concentration, abstract thinking, judgment, aphasia, apraxia, agnosia, and constructional ability. To perform the MMSE, the patient must have intact functional abilities, including motor control, vision, and hearing. If the patient is functionally impaired beyond correction, the clinician should use another test or refer the patient to a neuropsychologist. The clinician must carefully assess the patient's educational level and primary language ability before administering the MMSE, which is only valid and reliable (i.e., sensitivity of 87%, specificity of 82%) for persons whose primary language is English. With a scale from 0 to 30 points, the MMSE's cut-off score to indicate cognitive impairment drops from 24 for patients with high school education to 18 for patients with only an eighth-grade education. To use the MMSE to assess a patient's progress, a clinician should record a patient's answers verbatim, both correct and incorrect, to enable comparisons during follow-up care.

Blessed

The Blessed Orientation-Memory-Concentration Test (Blessed) (Costa, Costa, Williams, & Somerfield, 1996) is a six-item instrument to measure short-term recall, concentration, spatial ability, and orientation. The test requires verbal ability.

Although brief and reliable, the test does not measure cognitive abilities, as does the MMSE. Questions regarding orientation have higher weightings than do questions addressing concentration, memory, and mathematics. Scores range from 0 to 28, with a score of 10 or above indicating dementia.

Clock Drawing Test

The Clock Drawing Test (CDT) (Freedman et al., 1994) is a brief, widely used, and easy-to-administer instrument to assess executive control and temporal-parietal abilities. The CDT is reliable and less influenced by language, culture, and education, given that most people use clocks. The test's main limitation stems from its many versions, each varying slightly in scoring criteria and instructions. Whereas each version accurately assesses certain functions, different scoring methods impede comparisons across studies. Yet, the CDT's fundamental concept remains easy to understand and sound. A clinician asks a patient to draw a clock set at a specific time. Instructions differ in setting the clock at different times, in drawing freehand versus completing a predrawn circle, and in copying a clock that the examiner has already drawn. Scoring also varies by the number of details evaluated. Practitioners should use one version of the CDT consistently to facilitate follow-up comparisons.

Memory-Impairment Screen

The Memory-Impairment Screen (MIS) (Buschke et al., 1999) is a brief, reliable, and valid test for early dementia and memory impairment. The MIS is part of a longer, more complex screen with high discriminative validity. The MIS tests only memory, proving most accurate for patients with a suspected diagnosis of AD and least accurate for persons with suspected frontal-lobe deficits, subcortical dementias, and intact memory. The MIS tests free and cued recall of four words that the patient has been asked to learn. A clinician determines the patient's score, on a scale of 0 to 8, by making the following calculation: (2 X Free Recall) + Obtained Cued Recall. The cutoff score of 4 has a sensitivity of 0.69 for mild dementia and 0.92 for moderate dementia. When analyses are restricted only to AD dementia, the sensitivity for mild dementia is 0.79 and 0.95 for moderate impairment.

The Mini-Cog

The Mini-Cog assessment instrument (Borson, Scanlon, Brush, Vitaliano, & Dokmak, 2000) is a brief test, can be administered in approximately 3 minutes, is relatively uninfluenced by level of education or language variations and, in at least one study, is comparable in a diverse population to the MMSE. The Mini-Cog combines an uncued three-item recall test with the CDT that is used as a distractor during the interval for short-term recall. The main strength of this instrument is its ease of use and the combination of memory and executive function instruments. However, an uncued recall test is not particularly accurate because it will screen as impaired patients who suffer only from difficulties in retrieval and not storage of information. Retrieval can be impaired in nondemented patients with Parkinson's disease or other neurological illnesses; deficits in learning of new information are characteristic of AD. Patients with AD will not benefit from cues, patients with Parkinson's disease will. Therefore, a more accurate instrument could be obtained combining a cued recall test (e.g., MIS) with the CDT.

Other Tests

Several other instruments are available to test for cognitive deficits. A full battery of tests typically requires several hours to administer, score, and interpret and should be administered only by trained practitioners. Most clinicians caring for the elderly need to be familiar with only a few instruments and know when to refer a patient to a specialist. Some of the more complex tests are relevant primarily for their usefulness in clinical research. Among such tests is the Dementia Rating Scale (DRS) (Gardner, Oliver-Munoz, Fisher, & Empting, 1981) that consists of 36 tasks, comprising 5 subscales that measure attention, initiation/perseveration, construction, conceptualization, and memory. The DRS's total score cut-off is 123, with separate cut-off scores for each subcategory indicating specific deficits. For example, a patient with impaired scores in the initiation/perseveration and conceptualization subscales but with intact memory would suggest a frontal deficit and make a diagnosis of AD unlikely.

The Boston Naming Test (Kaplan, Goodglass, & Weintnaube, 1983) assesses naming difficulties associated with aphasia common to cortical dementias. The Trail-Making Test (Reintan & Wolfson, 1985) measures attention capacity, with particular sensitivity to frontal lobe deficits and early detection of subcortical dementia.

No instrument for screening cognitive deficits is perfect or complete. Some are more affected by primary language, education, and cultural background; others are less standardized or measure only specific functions. Testing with the MMSE, MIS, and CDT will generate a reasonably thorough set of results. Together, these three tests require 10 to 15 minutes to complete, are easily interpreted, and facilitate a screen for cortical and subcortical dementia that is superior to any single instrument. Most important, a clinician must determine when to refer a patient for further testing. If a patient with a high level of education and pre-morbid functioning complains of cognitive decline but scores above the cut-off threshold in a screening test, the patient should be referred for further testing. Moreover, any person showing a discrepancy between functional capacity and screening performance should see a specialist.

Early Detection and Prevention: Mild Cognitive Impairment

During the past decade, clinicians have become increasingly interested in detecting and responding to the pre-morbid phases of dementia. A new classification, Mild Cognitive Impairment (MCI), has arisen to describe the early cognitive changes that appear in some elderly patients but do not meet the criteria for dementia. The group that designed the MIS has developed a new instrument called the Memory Capacity Test (MCT), which aims to detect pre-symptomatic AD. This test requires several steps. The patient is instructed to learn and recall two lists of items from 16 categories. Although the two lists have identical categories, each list has a different item for each category. Preliminary results suggest that this test is sensitive, specific, and reliable, although more data are required to confirm these results. The NYU Paragraph Recall Test (PRT) (Kluger et al., 1999) was used in several studies assessing the efficacy of cholinesterase inhibitors (agents used to retard progression of AD symptoms). The MCT and PRT define MCI as a purely amnestic disorder. Other groups have suggested that MCI is a syndrome involving decline in multiple cognitive domains. Two recently published studies describe instruments used to assess MCI. All studies acknowledge that MCI is a controversial classification whose exact definition is evolving. None of these tests is ready for general use by practitioners, although the development of each indicates an ongoing effort to develop methods to detect cognitive impairment as early as possible.

ALESSANDRA SCALMATI
CAROLE SMYTH
QAMRUN ABEDIN

See also
Cognition Instruments
Depression Measurement Instruments
Pain Assessment Instruments

Internet Resource
Society of Hospital Medicine Clinical Toolbox
http://www.hospitalmedicine.org/geriresource/toolbox

REFERENCES

Borson, S., Scanlon, J. M., Brush, M., Vitaliano, P. P., & Dokmak, A. (2000). The mini-cog: A cognitive "vital signs" measure for dementia screening in multilingual elderly. *International Journal of Geriatric Psychiatry*, *15*(11), 1021–1027.

Buschke, H., Kuslansky, G., Katz, M., Stewart, W. F., Sliwinski, M. J., Eckholdt, H. M., et al. (1999). Screening for dementia with the Memory Impairment Screen. *Neurology*, *52*(2), 231–238.

Costa, P. T., Williams, T. F., & Somerfield, M. (1996). *Early Identification of Alzheimer's Disease and*

Related Dementias. Clinical Practice Guideline. Quick Reference for Clinicians (Report No. 97-0703). Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state": A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, *12*(3), 189–198.

Freedman, M., Leach, L., Kaplan, E., Winocur, G., Shulman, K. T., & Delis, D. C. (1994). *Clock Drawing: A Neuropsychological Analysis*. New York: Oxford University Press.

Gardner, R., Oliver-Munoz, S., Fisher, L., & Empting, L. (1981). Mattis Dementia Rating Scale: Internal reliability study using a diffusely impaired population. *Journal of Clinical Neuropsychology*, *3*, 271–275.

Kaplan, E. F., Goodglass, H., & Weintnaube, S. (1983). *The Boston Naming Test*. Philadelphia: Lea and Febiger.

Kluger A., Ferris S.H., Golomb J., Mittelman M.S., Reisberg B. Reitan, R. M., & Wolfson, D. (1985). *The Halstead–Reitan Neuropsychological Test Battery*. Tempe, AZ: Neuropsychology Press.

Kluger, A., Ferris, S.H., Golomb, J., Mittelman, M.S., & Reisberg, B. (1999). Neuropsychological prediction of decline to dementia in nondemented elderly. *Journal of Geriatric Psychiatry and Neurology, 12*(4): 168–179.

COGNITIVE CHANGES IN AGING

Cognitive changes are a hallmark of the aging process, and the impact of those changes can be observed in almost all aspects of an older person's life. The speed of learning to program a new VCR, the likelihood of remembering the instructions for a new medication, and the ease of comprehending a document comparing five Medicare programs diminish with aging. Even in the absence of dementing illnesses, most older adults will experience some degree of cognitive decline, primarily in memory efficiency, by the seventh decade of life.

Cognitive Aging

Many aspects of cognition begin to decline measurably by middle age in the average adult. Information-processing speed peaks in the 20s and continually declines thereafter, becoming marked in the 70s and 80s, contributing to poorer memory performance, difficulty comprehending spoken and written communications, less effective reasoning ability, and impaired learning (Grady & Craik, 2000). Cognitive slowing is particularly evident with complex tasks or those that require multiple steps for completion (Kramer, Bherer, Colcombe, Dong, & Greenough, 2004).

Aging is also associated with decreased working memory functioning—the ability to hold some information in consciousness while manipulating other information. Working memory is essential to comprehension; for example, ambiguous sentences are held in working memory until later sentences clarify them. Decline in working memory also contributes to poorer memory performance, especially when the person must learn or recall under conditions that tax processing ability. Noisy environments—visually, auditorily, or informationally noisy—place demands on working memory that can interfere with comprehension, learning, and remembering.

Although many aspects of cognition decline with advancing age, not all cognitive capabilities follow this pattern. Most individuals who remain mentally active will continue to acquire general knowledge throughout life, which supports much of the success in day-to-day cognitive activities. With cognitive slowing and deficits in working memory, greater reliance may be placed on the automatic processes supported by accumulated general knowledge. Rather than attempting to understand a complex, new soufflé recipe, an older woman may make the same chocolate cake she has baked for 45 years. Much of daily life involves tasks performed with minimal conscious processing; these automatic activities are relatively well preserved in later life. Knowledge and wisdom acquired throughout one's lifetime continue to have important positive influences on a person's daily activities and decisions. Even though most people will experience frustrating memory lapses from time to time as they grow older, the majority of people will not suffer significant cognitive problems in their daily activities.

Self-Reports

Caregivers call upon their clients and patients to provide self-reports. The older adult has to comprehend questions, accurately retrieve the answers and truthfully report symptoms, names and schedules of medications, family histories, dietary intakes, moods, and so forth. Unfortunately, self-reports can be unreliable sources of critical information, more so with age-related cognitive decline (Feinberg & Whitlatch, 2001).

Consider a 78-year-old woman who is asked, "How have you felt during the past month?" If she interprets this question as asking whether she has been sick or experienced any severe pain, she might answer, "I've been feeling fine." If she interprets the question as asking whether she has had any minor aches and pains, she might answer, "Not so good—I've had better days than this." If she interprets the question as asking whether she has been sad or depressed, her answer might be totally different. Even a well-structured question like "How many pieces of fruit do you eat on an average day?" may elicit different answers if the half grapefruit eaten at breakfast and the other half eaten at lunch are considered as one piece of fruit or two. Comprehension can be increased by using simply worded questions and examples and by allowing the person to read the question as well as hear it. Speech is sometimes too fast for an older adult's limited working memory, thereby interfering with comprehension. Auditory presentations tax working memory. Older adults are more likely than younger adults to endorse the final alternative of a set of auditorily presented choices, but this difference is not observed when choices are presented visually.

At any age, it is difficult to remember the frequency of events, such as visits to the doctor; this memory task becomes more difficult with aging. Greater accuracy may be achieved by asking the person to name the doctor and the purpose of each visit. Written response alternatives, such as lists of diseases or symptoms, rather than open-ended questions can also improve recall for topics such as family medical histories.

Care-Related Information

Although considerable time and resources are spent presenting information to people of all ages regarding their care, much of this information is soon forgotten. The problem is compounded in old age, particularly if the information is presented auditorily. Rapid rate and cadence of speech, failing to make eye contact to judge comprehension, failing to signal the most important parts of the message, using jargon, and providing too much information all have greater negative effects on memory for older adults than for younger adults. Memory can be aided by asking the person to repeat back the important points and by providing a clear and simple written summary (Kramer et al., 2004). Older care recipients should be encouraged to take notes and then read them back to check accuracy. When in doubt about the care recipient's memory, a surrogate should be included in the discussion. Under high-stress situations, even people with good memory ability may have difficulty comprehending and remembering instructions.

Cognitive factors also influence medication-adherence behaviors. Research suggests that the young-old (ages 60 to 75) tend to have relatively high rates of medication adherence, but that the older-old (older than age 75) are more likely to forget their medications (Insel, Morrow, Brewer, & Figueredo, 2006). Cognitive interventions, such as providing the older adult with a pill organizer and a chart outlining the proper medication regimen, are effective in reducing omission errors, probably because they reduce the memory demands of complex regimens.

Communicating With Older Adults

Speakers produce between two and three words per second, requiring listeners to comprehend at the same pace. Spoken communications can strain the working memory capacity of older adults. Unlike written communications in which the reader can go back and reread a passage, the listener cannot get back words spoken even a few seconds ago.

Communication with older adults may benefit from using sentences with fewer syntactic complexities (e.g., embedded clauses) and with clearly presented major points. Speakers can improve the quality of communication by providing examples and summaries of the important points, without having to talk down to or demean the listener. Reduced auditory acuity makes it more difficult to distinguish spoken sounds and increases reliance on nonverbal components of the communication. Older adults make great use of their knowledge to fill in what was not well heard. They also rely on the normal intonations and pitch changes of spoken communications to comprehend what is being said.

In summary, older adults' slowed cognitive processing and their reduced working memory resources can contribute to difficulties in comprehending and remembering important care-related information. However, if the information is presented in such a way that the older adult can use his or her many years of knowledge to process it, most age-related cognitive deficits should be minimal.

Editorial Staff

See also

Cognition Instruments
Communication Issues for Practitioners
Dementia: Overview
Depression in Dementia
Medication Adherence
Psychiatric Diagnosis and the *DSM-IV-TR*

Internet Resources

University of California, San Francisco
http://memory.ucsf.edu/Education/Topics/normalaging.html

REFERENCES

Feinberg, L. F., & Whitlatch, C. J. (2001). Are persons with cognitive impairment able to state consistent choices? *The Gerontologist*, *41*, 374–382.

Grady, C. L., & Craik, F. I. M. (2000). Changes in memory processing with age. *Current Opinion in Neurobiology*, *10*, 224–231.

Kramer, A. F., Bherer, L., Colcombe, S. J., Dong, W., & Greenough, W. T. (2004). Environmental influences on cognitive and brain plasticity during aging. *Journals of Gerontology Series A-Biological Sciences & Medical Sciences*. *59*(9), M940–957.

Insel, K., Morrow, D., Brewer, B., & Figueredo, A. (2006). Executive function, working memory, and medication adherence among older adults. *Journals of Gerontology Series B-Psychological Sciences & Social Sciences*, *61*(2), 102–107.

COMMUNICATION ISSUES FOR PRACTITIONERS

Communication that produces understanding between older adults and health care providers is central to high-quality care. All communication requires a two-way receptive and expressive process that can be impaired by age-related sensory and physical losses. Communication works best in a "shared reality." It is frequently and erroneously taken for granted that we see the same thing at the same time. For example, elders with dementia are in a different reality. Families, patients, and health care providers with differing goals are all in different realities.

Communication interchange is facilitated when expectations are fulfilled. Preconceived ideas, cultural expectations, or unanticipated and confusing patient behaviors make continued conversation difficult. Comfort level with a conversation is also critical to understanding. Sensitive topics such as sexuality, urinary incontinence, depression, elder abuse, terminal care, advance directives, cognitive impairments, and death may cause different kinds and intensities of discomfort for elders, providers, and family members. Lack of confidence, diminished ability, lack of control, sociocultural differences, environment, or ageist views can inhibit open communication and leave essential components of care unaddressed (Gould, 2005). Effective communication with older adults requires the personal communication skills of openness, honesty, respect, clarity, directness, and assertiveness (Marshall & Houseman, 2000).

Active listening is both an attitude and a skill. Older adults may not have a good listening attitude or skills because of physical difficulties or anxiety. Professionals as well as elders may be poor listeners because of cultural differences or long-standing patterns of behavior. Good listening requires concern, centering, connecting, concentrating, capturing, and clarifying (Marshall & Houseman, 2000). Listening is an acquired skill; an individual has to be predisposed to hear what another has to say. Health care professionals need to value what elderly patients have to say, even when it at first appears confusing or irrelevant. It is the responsibility of the professional—not the elder—to clarify what is unclear. Using closed rather than open-ended questions can focus and help direct both listening and responding.

Speakers produce between two and three words per second, requiring listeners to comprehend at the same pace, which can strain the working memory capacity of older adults. Enhancing conversation with nonverbal components and using simple sentences can help older adults use their knowledge of conversation standards and information from intonation and pitch to fill gaps that result from distorted comprehension. Rapid and monotone speech that lacks intonation and pitch, such as that generated by computers in telephone menus or by health care professionals who repeat the same information regularly, lacks the changes that cue important content. However, health care professionals must be wary of exaggerated or overly slow speech in order to avoid patronizing elders (McEvoy, 2000).

Physical, cognitive, psychological, and sociocultural barriers to communication can be generated by the older adult, the health care professional, and the environmental and organizational setting in which the patient and provider find themselves.

Physical barriers consist of functional deficits in hearing, vision, speech, and movement. Often dismissed as a normal part of aging, they can significantly affect receptive and expressive functioning. These deficits do not work like an on-off electrical switch. Physical capacity spans a continuum; changes over time and multiple conditions that exacerbate isolation of the elderly can increase problems. In addition, pain can inhibit communication. Pain can be so debilitating that it becomes the focus of attention for an elder and greatly inhibits the ability to listen. The importance of identifying physical health barriers cannot be overemphasized. All too often, communication difficulties due to sensory or physical impairments are mistaken for "confusion" or dismissed as a normal part of aging.

Techniques for communicating with hearing-impaired older adults begin with getting the person's attention. Facing the older adult and keeping light on the speaker's face rather than backlighting are important. After asking whether the person has a hearing aid, it may be necessary to check that it is in position and working properly. Speech should be slow and clear but not overemphasized. Low-pitched tones are heard more easily than higher tones. Background noise needs to be eliminated. A misunderstood sentence should be rephrased rather than repeated. Additional nonverbal approaches to communication such as gestures, diagrams, and written materials help comprehension. Having the elderly person repeat essential facts ensures understanding. The elder should be cued in advance when the topic of conversation is about to change (League for the Hard of Hearing, 1996). With the patient's permission, a sign can be posted above the bed, on the door, on the gurney, or outside the medical-record file to alert health care personnel of the hearing impairment. Doing this, however, may be subject to state regulations about patient privacy and confidentiality.

Techniques for communicating with the visually impaired elderly always begin with announcing or telling the elder that a person is entering or leaving the room. Activities should be narrated and precise directions given, such as "right" and "left" rather than general terms like "over there." Vision aids are helpful and ensure that there is adequate light. The elder may be wearing eyeglasses, but they should be checked for cleanliness. Unusual posture may be due to vision impairments such as a lack of peripheral vision rather than avoidance behavior. For print material, 14-point black type on a white background is helpful. Respectful touch that is sensitive to cultural preferences can enhance communication (Lighthouse International, Inc., 1999). As with a hearing-impaired patient, a sign can be posted with the patient's consent, as long as state regulations are followed.

Techniques for communicating with speech-impaired elderly persons depend on recognition of the speech impairment to assuage embarrassment and frustration. Alternative mechanisms for communication (e.g., written materials, signs, cards), gestures, and body language can augment communication.

Barriers caused by cognitive impairment can make communication a frustrating and exhausting experience. The most common behavioral responses from cognitively impaired elders are confusion, embarrassment, and aggression. Because verbal ability is often reduced, nonverbal forms of communication are increased. In addition, understanding the impact of external influences such as alcohol and drug dependency, pharmacological reactions from multidrug use, and metabolic and nutritional deficiencies on cognitive ability helps health care professionals create realistic expectations and strategies for both short- and long-term communication with cognitively impaired older adults.

Effective communication with cognitively impaired elderly persons requires realistic expectations. Trying to force reality orientation on severely demented people in nursing homes or expecting a cognitively impaired elder to remember a complicated drug regimen is unrealistic. One direction at a time elicits more comprehension and a successful execution. Alerting the elder to a change in subject helps him or her focus. Written instructions with pictures can help any patient—and certainly cognitively impaired older adults—achieve greater understanding. Many "disturbing" behaviors and "incomprehensible" statements are logical for the cognitively impaired person but, unfortunately, they are not logical to us (Feil, 1999). Confidence and trust gained through verbal and physical reassurance and validation can create the bonding needed for good communication; otherwise, incomprehension can result in aggression or withdrawal. Disruptive verbal or nonverbal behavior does not necessarily mean what it appears on the surface; rather, it might represent fear, expression of loss, unmet physical or emotional needs, or an attempt to maintain past behavior patterns.

Psychological barriers that impede effective communication derive not only from elderly people but also from health care professionals. Issues of power and control, and histories of personal loss and painful relationships and events—our personal baggage—are significant psychological barriers. Additional psychological conditions such as depression and anxiety, which are prevalent in older adults and not a normal part of aging, or fixations and obsessive behaviors can foster withdrawal or inhibit productive communication (Dreher, 2001).

Techniques for circumventing psychological barriers depend on awareness of issues, personal baggage, and psychiatric conditions. It is important to recognize and respect what an elderly person brings to the table. However, a clinician's expression of sympathy should not legitimize withdrawal or aggressive behavior.

Sociocultural barriers to communication between an older adult and health care provider can be the most difficult to circumvent, in part because they are the most elusive. Culture (i.e., beliefs, values, and customs), socioeconomic status, education, and assimilation all influence the effectiveness of communication with the elderly. However, language is the medium through which we communicate many of our cultural differences. In some cultures, language creates reality as well as reflects it. Some people will not say "cancer" because they are convinced that uttering the word will bring on the disease. Working with language interpreters is never easy. Family members or caregivers who double as interpreters are especially difficult because their own needs and frustrations often interfere with their ability to translate the words of the elders and health care professionals. Family interpreters should be directed to "translate," not "interpret," and need reassurance that they will be asked for their views after the patient interview.

Techniques for communicating with socioculturally diverse elderly can be greatly enhanced by using key words in the language of the older patient to foster trust and comfort. Understanding the cultural beliefs and value systems of elderly patients and their families—particularly regarding respect, nutrition, pain, and death—will help in understanding their perspective and expectations. Appreciating key customs and rituals will prevent awkward social or communication errors. All this requires a suspension of stereotypes and prejudice.

Common ground is essential for successful communication with the elderly, and health care professionals must make the effort to find it. It is imperative to understand the elder's point of view, as all people want to be seen as individuals. It is an injustice to communicate in the same manner with a healthy 68-year-old and an 89-year-old with multiple chronic conditions. Each of us looks at the world through a unique prism. For the elderly, as for all of us, physical limitations, cognitive and psychological status, and sociocultural backgrounds influence point of view—the way we perceive, understand, and communicate with the world. Age tempers this view. Health care workers view the world through a professional prism that sometimes filters out significant parts of a person's life. Good communication means looking at the world through the patient's prism, which requires empathy and respect.

Elaine S. Gould

See also

Cognitive Changes in Aging
Cultural Assessment
Cultural Competence and Aging
Hearing Aids
Hearing Impairment
Low Vision
Validation Therapy
Vision Changes and Care

Internet Resources

Alzheimer's Association
http://www.alz.org

League for the Hard of Hearing
http://www.lhh.org

Lighthouse International, NYC
http://www.lighthouse.org/index_main.htm

National Institute on Aging
http://www.nih.gov/nia/publications

REFERENCES

Dreher, B. (2001). *Communication skills for working with elders*. New York: Springer Publishing Co.

Feil, N. (1999). Current concepts and techniques in validation method. In M. Duffy (Ed.), *Handbook of counseling and psychotherapy with older adults*. New York: John Wiley & Sons.

Gould, E. (2005). Sensory changes and communication with older adults. In Rader C (Ed.), *Best nursing practices in care for older adults*: *Staff development* (CD ROM). New York: New York University, Hartford Institute for Geriatric Nursing.

League for the Hard of Hearing (1996). *Tips for health care workers*. New York: Center for Health Care Access.

Lighthouse International, Inc. (1999). *The world through their eyes—Understanding vision loss: A manual for nursing home staff*. New York: Lighthouse International, Inc.

Marshall, S., & Houseman, C. (2000). *Communicating in today's world*. Philadelphia: Lippincott Williams & Wilkins.

McEvoy, C. L. (2000). Cognitive changes in aging. In M. Mezey et al. (Ed.), *Encyclopedia of elder care* (1st ed.). New York: Springer Publishing Company.

Solie, D. (2004). *How to say it to seniors: Closing the communication gap with our elders*. New York: Prentice Hall Press.

COMMUNITY ASSESSMENT

Comprehensive Geriatric Assessment (CGA) is "a multi-disciplinary evaluation in which the multiple problems of older persons are uncovered, described, and explained, if possible; and in which the resources and strengths of the person are catalogued, need for services assessed, and a coordinated care plan developed to focus interventions of the person's problems" (National Institute of Health, 1988). A cornerstone of successful community assessment, CGA in the home setting provides a unique picture of the older person. A recent innovation in the organization of patient-care communications, the Siebens Domain Management Model (SDMM), assists the clinician to effectively communicate among multiple providers and family caregivers (Siebens, 2001).

Assessment

A summary of what is typically covered in the comprehensive community assessment of an older individual is summarized in this section, organized in the SDMM format:

Domain I: Medical/Surgical Issues

- Physical health—salient results from assessing:
  Medical history, review of systems, self-reported chronic conditions, self-perceived health status
  Physical examination (nutritional status, oral health, skin, gait and balance performance)
  Lab studies
  Examination of home pharmacy—medication, other daily supplement use
  Preventive visits and health maintenance adherence

Domain II: Mental Status/Emotions/Coping

- Psychological (mental) health and related topics—salient results from assessing:
  Communication (hearing, vision)
  Mental status—cognitive screening
  Emotions—depression and anxiety screening
  Coping—self-perceived quality of life, management of stressors
  Spirituality—spiritual beliefs and practices
  Behaviors
  Advance directives

Domain III: Physical Function

- Function—salient results from assessing:
  Basic activities of daily living (BADLs)—home mobility, self-care
  Instrumental activities of daily living (IADLs)—community mobility, household tasks
  Advanced activities of daily living (AADLs)—vocational, avocational, social roles

Domain IV: Living Environment

- Environment—salient results from assessments of three main areas:
- Physical environment, home safety/hazards, accessibility to community
- Social issues—social support network (size, quality of relationship, family coping), social resources like attendants, senior center social activities
- Financial and other community resources—health insurance, income, financial benefits like Social Security, transportation

Results from in-home CGA studies reveal a high prevalence of suboptimally treated health problems (Stuck et al., 1995). The most common include hearing deficit (65% of clients), musculoskeletal problems (63%), arthritis (61%), hypertension (58%), cataracts (50%), and unsafe environments (46%). Less frequent, but with major potential health consequences, are other vision deficits (35%), urinary incontinence (32%), osteoporosis (31%), depression (26%), anemia (23%), arrhythmia (23%), postural hypotension (23%), and gait and balance disorder (23%). The use of CGA, organized by domains, is likely to reduce undertreated conditions.

Recommendations

Community assessment becomes an intervention only when linked with a care plan. The plan can take different forms depending on the client or patient population. For frail older adults, community CGA is the basis of medical, psychological, and functional management. This may include recommendations for placement or services for lost abilities and to prevent nursing-home placement. For well elders, CGA becomes a risk-appraisal method with recommendations made to the older person for what he or she can do to maintain or improve health and prevent functional decline. CGA and the Domain Management Model can improve posthospital outcomes, manage chronic disease, supplement regular primary care for the elderly, and prevent functional decline (Alessi et al., 1997; Siebens, 2001 and 2002).

As the front end of a system of care, community assessment is supported by a comprehensive set of community resources, educational materials, and negotiation strategies. Each health problem uncovered may have several alternative management responses. For example, an older adult's gait and balance disorder may need to be presented to her as a serious health risk (of falling). Recommendations are likely to cover several domains: discontinue use of high-heeled sandals (dressing, BADL), remove throw rugs in her home (physical environment), see the podiatrist for foot care (medical-issue management), and see her primary care physician regarding the increasing pain in her hips (medical management).

Adherence

The next step in the care system requires turning recommendations into action. In clinic- and hospital-based CGA, the best health outcomes resulted from situations in which the clinician doing the CGA also carried out the plan in contrast to typical community assessment in which recommendations are made to be implemented by the older person, family, or primary care provider. The SDMM can be used as part of a patient-care communications protocol that includes a patient care notebook (Siebens & Randall, 2005).

One advantage of community assessment, reported by CGA program nurses, is that the relationship with the older person is on more equal terms (Stuck et al., 1995). More of a partnership is established between the patient/client and the health care provider. The nurse remains the expert, and the older person is expert on his or her own situation. In addition, common self-care recommendations—taught, modeled, and reinforced in the home environment—have a greater likelihood of being followed. In one study, nurse practitioners made 5,694 specific recommendations to 202 clients during 3 years; 51% involved a self-care activity; 20% referral to a nonphysician professional or community service; and 29% referral to a physician (typically the client's own primary care provider). Referrals to physicians had the highest level of full or partial adherence (70%), self-care recommendations were followed about 60% of the time, and community referrals about 50% (Alessi et al., 1997). Adherence to recommendations made to the clients appeared to follow a pattern related to the degree of habit change involved, perceived seriousness of the problem, and familiarity with recommended behavior.

Clinician Competencies

The clinician doing community assessment should have the knowledge and skill to complete all components of the CGA, know about self-care and community resources, know how and when to seek consultation, when to refer to physician care (and when not to), and how to use principles of adult learning to promote behavior change for good health behaviors and outcomes. The SDMM and organized, written information, as in patient care notebooks, are easy-to-use methods for efficient organization and communication about essential community-assessment information (Moscowitz, 2002). These methods are also critical for effective team function.

Interdisciplinary clinical teams are extremely important to successful community assessment. The team may include a nurse practitioner or community nurse, with backup from a geriatrician, and consultation as needed from a social worker. Depending on the available resources and the skills of the nurse, consultation from a physical therapist, nutritionist, and pharmacist can be helpful. The intervention is more cost-effective if only one person is in the field (i.e., the nurse). This also improves adherence because only one person interacts with the client. Simple but comprehensive documentation and communication is essential for team collaboration and to prevent oversights of important issues.

Time Frame

Behavior change and improvement in health status (or prevention of functional decline) takes place over months and years. Repeated assessments yield new problems and recommendations. Reinforcement of positive change is a continual process. In a randomized controlled trial (Stuck et al., 1995), after 3 years of annual in-home CGA and quarterly home visits by a nurse practitioner, intervention group subjects (n = 215) had significantly fewer permanent nursing-home placements and fewer nursing-home days than the control group (n = 199). In addition, the participants were more independent in daily chores and activities. They also had increased physician visits (which, although increasing the costs of the program, may have also led to concomitant reduction in nursing-home days) and used more community services that promoted socialization, such as senior transportation and special community-college programs. There were no significant differences between the intervention and control groups in the use of in-home supportive or personal-care services.

Community-assessment programs are slow in gaining acceptance. As for any intervention that is primarily diagnostic and preventive, payment sources are elusive and methods for enrollment sometimes complex. Nevertheless, growing evidence of cost-effectiveness of CGA and effective communication strategies make these approaches promising for further development and wider implementation.

Harriet Udin Aronow
Hilary C. Siebens

See also

Teams
Health Maintenance
Home Health Care
Primary Care Practice

Internet Resources

Geriatrics at Your Fingertips – On-line Edition. American Geriatrics Society
http://www.geriatricsatyourfingertips.org/

Merck Manual of Geriatrics
http://www.merck.com/pubs/mm_geriatrics/

Siebens Patient Care Communications
http://www.siebenspcc.com

REFERENCES

Alessi, C. A., Stuck, A. E., Aronow, H. U., Yuhas, K. E., Bula, C. J., Madison, R., et al. (1997). The process of care in preventive in-home comprehensive geriatric assessment. *Journal of the American Geriatrics Society*, *45*(9), 1044–1050.

Moskowitz, B. (2002). Bridging to family and community support for older adults and the Domain Management Model. *Topics in Stroke Rehabilitation*, *9*, 75–86.

National Institute of Health, Consensus Development Conference (1988). National Institute of Health, Consensus Development Conference Statement: Geriatric assessment methods for clinical decision-making. *Journal of the American Geriatrics Society*, *36*, 342–347.

Siebens, H. (2001). Applying the Domain Management Model in treating patients with chronic disease. *Joint Commission Journal on Quality Improvement*, *27*, 302–314.

Siebens, H. (2002). The Domain Management Model—Organizing care for stroke survivors and other persons with chronic disease(s). *Topics in Stroke Rehabilitation*, 2(*9)*, 1–25.

Siebens, H., & Randall, P. (2005). The Patient Care Notebook: From pilot phase to successful hospitalwide dissemination. *Joint Commission Journal on Quality and Patient Safety*. *31*, 398–405.

Stuck, A., Aronow, H. U., Steiner, A., Alessi, C. A., Bula, C., Gold, M., et al. (1995). A trial of annual in-home comprehensive geriatric assessment for elderly people living in the community. *New England Journal of Medicine*, *333*, 1184–1189.

COMPETENCY AND CAPACITY

Clinicians may be asked to evaluate the decision-making capacity of older adults in a variety of situations. Although the terms decisional *capacity* and *competency* are sometimes used interchangeably, *competency* usually refers to an evaluation derived from legal adjudication and *capacity* to a clinician's evaluation of a patient's decision-making abilities. Virtually every clinical encounter involves at least implicit judgment of a patient's decisional capacity. Informed consent has become a legal and ethical cornerstone for the delivery of medical care and requires the provision of adequate information, in a noncoercive manner, to a competent patient.

More formal and explicit evaluation of decisional capacity is most commonly conducted when a patient declines a treatment highly recommended by the treating clinician or team. Many patients refusing treatment in situations prompting capacity assessment are found to have impaired decisional capacity (Grisso & Appelbaum, 1998). However, it is critical that clinicians also consider the possibility that treatment refusal reflects differences between the patient and clinician in personal values, health-related goals, or risk-aversion. Cultural and religious differences are the most obvious sources of such situations. It is also important that clinicians be alert to situations of questionable decisional capacity among patients at risk for impaired decision-making capacity even when the patient consents to recommended treatment.

Older adults are certainly at increased risk for impaired decisional capacity, especially those with dementia, acute medical illness, psychosis, or severe depression (Grisso & Appelbaum, 1998). Decisional impairment in these illnesses may result from cognitive impairments and/or emotional factors, such as paranoid delusions or severe hopelessness. However, psychiatric illness and dementia do not invariably impair decisional capacity. Empirical data suggest that mentally ill patients and those with mild dementia frequently retain decisional capacity for certain decisions (Appelbaum & Grisso, 1995; Kim, Karlawish, & Caine, 2002). Each circumstance must be evaluated individually because diagnosis alone does not determine decisional capacity.

Formal capacity and/or competency evaluations may also occur in the context of nonmedical decision making. In this context, decisional capacity often involves complex clinical and social issues. Questions concerning older adults' competency and capacity may arise in situations related to drafting a will (i.e., testamentary capacity), managing one's finances, or the ability to vote. Testamentary capacity involves understanding the purpose of the will, the nature of the property in the will, how the will distributes the property, and the normally anticipated heirs. Legal guardians may be appointed to manage a person's financial assets when an impaired individual makes harmful financial decisions or appears in danger of doing so. Careful examination for conflicts of interest should occur when financial control is ceded to another party. Other scenarios that may call for a capacity evaluation in older adults include possible driving impairment or need for more supervised living arrangements. These may be emotionally charged issues and require balancing respect for patient autonomy with adequate protection of individual patients and society.

Evaluating Decisional Capacity

Although complicated cases may necessitate involving a clinician trained in decisional capacity assessment, such as a psychiatrist, all clinicians may and at times should explicitly evaluate decisional capacity. Some general principles are helpful to consider before embarking on a formal evaluation of decisional capacity. First is the need to clarify which specific decision is in question. Although the court system may declare a person to be globally incompetent if, for instance, that person consistently fails to provide for his or her own most basic needs (e.g., food, shelter, and clothing), clinicians are generally called upon to evaluate capacity to make a specific decision or type of decision. Health care decisions vary widely in their complexity, and decisional capacity may vary within the same individual depending on the cognitive skills necessary to understand a situation and on the emotions aroused by that situation.

A basic but sometimes overlooked aspect of capacity assessment is the need to ensure that the patient has, in fact, received all the relevant information needed to make an informed decision.

Technical information should be made comprehensible for people of varying intellectual abilities and educational backgrounds. This may entail flexibility in the format (i.e., auditory, written, or graphical) used to present information.

With these general principles in mind, it is important to remember there is no such thing as "the" right decision or method of decision making. Even apparently "logical" decisions may involve a mixture of rational and emotional motives. That said, several qualities have been consistently described as necessary for decisional capacity. The four most commonly cited criteria are (1) consistent communication of a choice, (2) factual understanding, (3) appreciation of a situation and potential consequences of a decision, and (4) rational manipulation of information (Appelbaum & Grisso, 1988).

The first two criteria are probably the most reliably agreed upon. Communicating a consistent choice, although an obvious need, may be problematic in highly ambivalent patients or those with fluctuating mental status. Special means of communication may be necessary for those with speech, language, or sensory impairment. Factual understanding includes knowledge about the risks and benefits of recommended treatment, as well as those of alternative treatments (including no treatment). Clinicians should decide on the most important broad concepts necessary for decision making because even well-educated patients in times of stress can forget or fail to understand the complexities of medical information.

The remaining two criteria are possibly more subjective and thus more difficult to standardize. The criterion of "appreciating" a situation refers to a patient's need to understand how factual information personally applies to himself or herself. It involves more than regurgitation of facts and requires awareness of one's own clinical condition. Questions to assess this ability might include the following: "What do you think is *really* wrong with you? Why do you feel the doctor is suggesting this treatment?" The last criterion of rational manipulation of data should focus on the process of reaching a decision rather than whether the final decision seems inherently "sensible" to the evaluator. One might ask the patient to discuss how he or she put all the information together and weighed the pros and cons to reach a decision.

Yet, capacity evaluation retains a degree of subjectivity. Using structured measures may provide additional information as well as increase the likelihood of reaching the most valid conclusion. The Folstein Mini Mental State Examination is a screening test of cognition familiar to many clinicians; some empirical data support its utility in assisting capacity assessment (Kim, Karlawish, & Caine, 2002). Its limitations include suboptimal sensitivity and specificity when scores are mid-range and lack evaluation of executive functioning. Executive functioning involves problem solving and planning, and it appears important in decision making (Marson & Harrell, 1999). Simple office tests, such as Trails A and B or verbal fluency, assess this cognitive domain. There are also instruments developed specifically for decisional-capacity assessment, such as the MacArthur Competence Assessment Tool, which includes measures for each of the four domains of decisional capacity discussed previously (Grisso & Appelbaum, 1998).

Options for Patients With Impaired Decisional Capacity

When a patient is deemed incapable of making a medical decision, several steps may be appropriate. First, the patient may warrant reevaluation after a few days if the medical decision is not more urgent. This is especially true if there is possible fluctuation in the patient's mental status or if capacity is impaired by a factor that may resolve with time or proper treatment (e.g., delirium). If possible, steps should be taken to improve the patient's capacity to make the decision in question. Educational interventions have proved beneficial for diverse patient populations in this regard.

When such efforts are unsuccessful or implausible, the next best scenario would be that the patient has an advance directive (AD) for health care specific to this decision. ADs, such as a "living will," can only anticipate a limited number of potential scenarios and often focus on end-of-life decisions such as whether to perform resuscitation or mechanical ventilation.

Clinicians caring for a patient with impaired decisional capacity usually must identify an appropriate person to act as a substitute decision maker. This is simple if the patient has completed a form declaring an official proxy decision maker, such as a durable power of attorney for health care. Otherwise, available family members are consulted and are most often encouraged to reach a decision based on the perceived values or previously expressed wishes of the patient. This model of proxy decision making, termed *substituted judgment*, contrasts with the "best interests" model, in which proxy decision makers act according to their own feeling as to what would be most appropriate for the patient. Some states have legislation that specifies the order in which family members assume priority in proxy decision making. In rare circumstances of irresolvable family conflict, the absence of family, or concerns over conflicts of interest, the court may act as the substitute decision maker or appoint a third party to act as the patient's legal guardian.

Our society values individual freedoms, reflected in the great care that is taken to determine that an individual is incapable of making health-related decisions. This is balanced by a need to protect the most vulnerable in the population. Decisional capacity also assumes priority in light of the increasing importance placed on involving patients in shared decision making in health care. Every clinician in every encounter uses some aspects of capacity assessment, and clinicians should be alert to situations in which more formal assessment is needed. Treatment refusal of well-accepted interventions in at-risk populations, such as older adults, is an obvious example. The principles of capacity assessment, however, include also considering that those who nod silently in agreement may lack decisional capacity and that those who protest loudly may simply have a different value system.

THOMAS W. MEEKS
LAURA B. DUNN

See also

Autonomy
Cognition Instruments
Geriatric Assessment Programs
Ethics Consultation
Guardianship and Conservatorship
Mental Capacity Assessment

Internet Resources

American Society on Aging
http://www.asaging.org/webseminars/websem.cfm?EventID=13139

The Belmont Report
http://www.nihtraining.com/ohsrsite/guidelines/belmont.html

The Ethical and Legal Implications of Informed Consent in the Patient-Practitioner Relationship
http://www.bioethics.gov/reports/past_commissions/making_health_care_decisions.pdf

UCSD Human Research Protections Program: Decision Making Capacity Guidelines
http://irb.ucsd.edu/decisional.shtml

REFERENCES

Appelbaum, P. S., & Grisso, T. (1988). Assessing patients' capacities to consent to treatment. *New England Journal of Medicine*, *319*(25), 1635–1638.

Appelbaum, P. S., & Grisso, T. (1995). The MacArthur Treatment Competence Study. I: Mental illness and competence to consent to treatment. *Law & Human Behavior*, *19*(2), 105–126.

Grisso, T., & Appelbaum, P. S. (1998). *Assessing competence to consent to treatment: A guide for physicians and other health professionals*. New York: Oxford University Press.

Kim, S. Y., Karlawish, J. H., & Caine, E. D. (2002). Current state of research on decision-making competence of cognitively impaired elderly persons. *American Journal of Geriatric Psychiatry*, *10*(2), 151–165.

Marson, D., & Harrell, L. (1999). Executive dysfunction and loss of capacity to consent to medical treatment in patients with Alzheimer's disease. *Seminars in Clinical Neuropsychiatry*, *4*(1), 41–49.

COMPLEMENTARY AND ALTERNATIVE MEDICINE

See

Alternative and Complementary Medicine

CONSERVATORSHIP

See
Guardianship and Conservatorship

CONSUMER-DIRECTED CARE

Principles of Consumer-Direction

Consumer-direction is a service model based on the philosophy that individuals with needs for long-term support should have choice and control over the supportive services they receive. Consumer-direction is also referred to as "self-direction" and is similar to "independent living" in the disability community and "self-determination" in the developmental disabilities/ mental retardation field. The goals of consumer-directed services, as in the disability community, are broader than staying out of a nursing home or merely performing activities of daily living on a regular basis. Rather, the goal is to empower the person with the disability to live a full life in the community—to work, if desired, carry on family life, attend functions and use facilities in the community, get further education, or pursue other personal interests (Simon-Rusinowitz & Hofland, 1993).

Consumer-directed home- and community-based services (HCBS) reflect a shift from the traditional paradigm of the agency-administered model. It transfers the focus of decision making from the service provider to the consumer and the family. In consumer-directed services, the consumer can decide which supportive services he or she needs, which caregivers to hire, how they should be trained, and when and how the service will be provided. In the traditional model, provider agencies determine consumers' needs based on the judgments of the agency's case manager or professional staff, assign a caregiver to the consumer, and determine the duration, amount, and scope of services rendered.

How Consumer-Direction Works

Consumer-direction is not a single model. It entails a continuum of approaches based on the degree of choice, control, and management responsibilities the consumer wants to assume (Stone, 2000). However, not all consumers wish to direct their own care and those who do should be able to choose the degree to which they do. This flexibility should be a hallmark of the consumer-directed model.

The essence of a consumer-directed program is the control the consumer has over the employment terms of the caregiver or personal assistant who provides supportive services. Generally, personal assistance involves persons or devices that help older adults or individuals with disabilities perform the everyday tasks they would perform by themselves if they were not disabled (Simon-Rusinowitz & Hofland, 1993). Caregivers' tasks may include assistance with some paramedical activities, such as taking medications and managing bowel and bladder programs or help with activities outside the home, including transportation and communication. In a consumer-directed model, consumers may be responsible for selecting, hiring, training, and firing caregivers and negotiating their work schedule and duties (Tritz, 2005). The consumer may be the common-law employer of the caregiver or the caregivers may be employed by an agency but directed by the consumer. Some consumer-directed programs allow the consumer to hire friends and relatives as caregivers. Few programs, however, allow hiring legally responsible relatives, such as parents or spouses (Friss Feinberg & Newman, 2005).

Consumer-directed programs vary regarding the amount and type of support services offered to consumers. Some programs offer consumers the option of a case manager or service coordinator to assist with employer tasks and financial management services to assist with payroll and taxes. Some programs allow consumers to designate a surrogate to assist with these tasks (Stone, 2000). The consumer-directed model called "Cash and Counseling" allows consumers to manage a monthly budget, which they can use to purchase personal assistance services as well as a broad range of other services and products they determine appropriate, including assistive technology or home modifications (Simon-Rusinowitz, Mahoney, Loughlin, & Sadler, 2005).

Implementing a Consumer-Directed Program

An HCBS program wishing to support or enhance consumer-directed practices should:

- *Incorporate consumer participation throughout policy making, planning, and implementation.* Programs should have a well-articulated philosophy of consumer control and a Consumer Bill of Rights describing all parties' rights and responsibilities. Consumer assessment, service-plan development, and quality-assurance practices should include consumer input and be responsive to consumer preferences. Case managers' training should help identify attitudes and biases that may be barriers to consumer-direction.
- *Provide consumers with comprehensive information to make informed choices about their care plan.* This information must include the following: (1) the differences between consumer-directed and agency-administered approaches; (2) risks involved in managing their own care; (3) the budget available for services; (4) limitations on services that can be provided; (5) responsibilities of other parties; (6) the quality of providers; and (7) appropriate avenues for complaints and appeals. Information should be provided in various formats appropriate for consumers with different types of disabilities.
- *Provide consumers with support so they can be effective employers and succeed in administering their care.* Consumers may need training in finding, interviewing, selecting, hiring, supervising, evaluating, and firing caregivers. Some programs provide a registry of screened and available caregivers as well as assistance in checking the backgrounds of job applicants. Consumers may need a financial-assistance service to do their financial tasks or they may need training in financial-management tasks such as bookkeeping, issuing paychecks, withholding relevant taxes, and meeting the required labor laws and regulations.

Cash and Counseling Demonstration and Evaluation

Despite the steady progression toward consumer direction, there are still commonly voiced fears about offering self-direction to the elderly. Some policy makers fear that older consumers will be abused, exploited, or neglected without agency-provided supervision or oversight. Others fear that consumers' health will deteriorate if their assistants are not trained home health aides or that consumers will be unable to train their assistants effectively or fire them, if need be. Budget-wary policy makers fear that hiring relatives as workers for consumers will substitute paid help for unpaid care that was already being provided or that consumers will spend the money inappropriately.

The recently completed Cash and Counseling Demonstration and Evaluation (CCDE) compared traditional Medicaid personal-assistance services to a consumer-directed cash option for a diverse sample of consumers: elders as well as adults and children with physical and cognitive disabilities. The CCDE found that the participants in the consumer-directed group expressed significantly more satisfaction with the care and services received than the control group who relied on agency-sent caregivers. Consumers had fewer adverse health outcomes and expressed fewer unmet needs than the agency-directed group. When faced with the option of hiring their caregivers of choice, more than 50% of the participants opted to hire relatives, including parents or spouses in some states. The consumers' caregivers expressed less physical and financial stress and strain (Mahoney, 2005). In this and other large-scale studies, none of the negative outcomes feared by policy makers were more frequent under consumer-directed care than with agency-directed models (Doty et al., 1999). The CCDE also found no major instances of fraud or abuse among the consumer-directed groups (Simon-Rusinowitz et al., 2005).

The Future of Consumer-Directed Care

Service systems for the elderly have been undergoing a paradigm shift. Currently, there is strong political support for consumer-directed HCBS (Friss Feinberg & Newman, 2005), which is being steered by strong advocacy, policy, and legislative gains in consumer-direction for people with disabilities and the successes of consumer-directed programs. Faced with a booming aging population and a caregiver workforce shortage, policy makers view consumer-directed HCBS as a strategy to increase direct-care labor force, reduce unmet needs, and address cultural-diversity issues (NASUA, 2004; Simon-Rusinowitz et al., 2005) in a cost-effective way. Moreover, consumer direction is consistent with the goal of independent and integrated living expressed throughout several federal policies and legislations that mandate the full integration of elders and individuals with disabilities into the community and require states to rebalance their support of institutional services and expand HCBS.

In fact, in 2004, there were 40 states and territories operating a total of 62 consumer-directed programs. Almost 40% of these programs were started in the previous 5 years (NASUA, 2004). With support from the Robert Wood Johnson Foundation and the U.S. Department of Health and Human Services (Assistant Secretary for Planning and Evaluation and the Administration on Aging), the CCDE is currently being expanded to additional states. In 2005, the Centers for Medicare and Medicaid Services incorporated the option of adding consumer-direction into all 1915c home- and community-based waivers. The Deficit Reduction Act of 2005 will make it possible in 2007 to include consumer-directed options in Medicaid state plan services. The appeal of consumer-directed services, including its simplicity, potential for cost-effectiveness, and support for autonomy, seems likely to ensure its expansion.

Lori Simon-Rusinowitz
Genevieve Martinez-Garcia
Kevin J. Mahoney
Barbara W. Schneider

See also
Autonomy
Substitute Decision Making

Internet Resources
Cash and Counseling Demonstration Evaluation
http://cashandcounseling.org

Clearinghouse for Community Living Exchange Collaboration
hhttp://www.hcbs.org

National Council on Aging initiative on consumer-directed care
http://www.ncoa.org

National Associations on State Units on Aging
http://www.nasua.org

REFERENCES

Doty P, Benjamin AE, Mathias R, Franke T. In-home supportive services for the elderly and disabled: a comparison of client-directed and professional management models of delivery. (Report no. 10–940-0022). Washington, DC: US: Department of Health & Human Services; 1999.

Friss Feinberg, L., & Newman, S. (2005). Consumer-direction and family caregiving: Results from a national survey. *State policy in practice/community living exchange*. New Brunswick, NJ: Rutgers Center for State Health Policy, National Academy for State Health Policy.

Mahoney, K. (2005). *Cash & counseling: Part of the long-term care answer?* Congressional Hearing Presentation, July 29. Available at http://www.cashandcounseling.org/resources/20060106-115728.

NASUA (2004). *States' experiences implementing consumer-directed home- and community-based services: Results of the 2004 survey of the state administrators, opinion survey and telephone interviews.* NASUA & The National Council on the Aging.

Simon-Rusinowitz, L., & Hofland, B. F. (1993). Adopting a disability approach to home-care services for older adults. *The Gerontologist*, *33*(22), 159–167.

Simon-Rusinowitz, L., Mahoney, K. J., Loughlin, D. M, & Sadler, M. D. (2005). Paying family caregivers: An effective policy option in the Arkansas Cash and Counseling Demonstration and Evaluation. *Marriage and Family Review*, *37*(1/2), 83–105.

Stone, R. (2000). Consumer direction in long-term care. *Generations*, *24*(3), 5–9.

Tritz, K. (2005).Long-term care: Consumer-directed services under Medicaid. *CRS Report for Congress*. Order code: RL32219. Washington, DC: Congressional Research Service and The Library of Congress, January 21.

CONTINUING CARE RETIREMENT COMMUNITIES

Continuing care retirement communities (CCRCs) provide for housing, services, and nursing care, usually all in one location or campus. Through long-term contracts signed on admission to a CCRC, elderly individuals or couples purchase a place to live, access to a range of services, and the opportunity to move to higher levels of care (i.e., assisted living or skilled nursing) if they should need a more intensive setting.

CCRCs are governed by state regulations in 38 states and are typically classified as an insurance model under the jurisdiction of the state department of insurance or another similar entity. Each of the components of the retirement community may also be subject to separate oversight: the independent housing units may be regulated at the local level, the assisted living is regulated by the state, and the skilled-nursing (i.e., nursing-home) component is governed by state and federal regulations.

The CCRC contract is a legal agreement between the consumer and the community. Upon payment of an entry fee and an ongoing monthly service charge, the agreement generally secures living accommodations and services, including health services, over the long term. Under the Type A (i.e., extensive, full insurance model) contract, residents pay an upfront fee and an ongoing monthly fee that guarantees them lifetime occupancy in an independent-living unit, certain services and amenities, and the ability to transfer to the appropriate level of assisted living or skilled nursing while continuing to pay the same monthly fee as they paid in independent living. Under the Type B (i.e., modified) contract, residents typically pay an upfront fee and an ongoing monthly fee for the right to lifetime occupancy of an independent-living unit plus certain amenities and access to a higher level of care setting for a limited period of time (usually 30 to 60 days). For longer periods in assisted living or the nursing home, the resident pays a higher but discounted rate relative to individuals who may be directly admitted to these settings from outside the CCRC. The Type C (i.e., fee-for-service) contract may also require an entrance fee but does not include any discounted health care or assisted-living services. Residents must pay the regular per diem rate to receive more intensive services but may receive priority admission to assisted living and the nursing home. Finally, admission to rental CCRCs require no upfront entrance fee and the resident pays the prevailing market rate for the level of care provided.

Although there is no consensus on the number of CCRCs in the United States today, a study conducted in the early 1990s (Somers, 1993) indicated the existence of 2,100 CCRCs at that time. In 2005, the American Association of Homes for the Aging (AAHSA), which represents a large proportion of nonprofit CCRCs across the country, surveyed 184 communities located in 32 states. Ten states account for 60 percent of the communities and two-thirds of the CCRC units. More than one-third of the CCRCs are located in five states—Pennsylvania, Ohio, Florida, Virginia, and Texas. Three-quarters of the responding CCRCs are nonprofit. Three- fifths of the communities are located in suburban metropolitan areas. Among the remaining CCRCs, rural communities far outweigh the number in urban metropolitan areas.

The median age of residents in this survey is 84 years. Almost three-quarters of the residents are female and 49% are part of a resident couple living in an independent-living unit. Only 9% of the CCRC residents are in assisted living and 4% are in nursing homes. The median length of stay in the various settings is 63.4 months in independent living, 22.8 months in assisted living, and 13.3 months in the nursing home. One-quarter of the people entering a CCRC have relocated from less than 5 miles away; 14% have moved from more than 25 miles. More than half of the CCRCs charge an entrance fee in the $100,000 to $199,000 range and less than 10% require less than $50,000 to gain admission to a community. Given these rates, it is clear that CCRCs are typically an option for upper-middle and high-income older adults.

The research on CCRCs has largely focused on the financial viability and management (Ruchlin, 1988), services offered (Alperin & Richie, 1990), and impact on the use of other community-based services (Sloan, Shayne, & Conover, 1995). Several studies (Sheehan & Karasik, 1995; Krout, Moen, Oggins, Holmes, & Bowen, 2000) have found that most CCRC residents report access to health care and medical services as key reasons for moving into the community. Other important reasons for moving into a CCRC include the desire to remain independent and not be a burden on the family, a wish to gain safety and security, and freedom from home upkeep and maintenance.

Among a sample of new residents of a CCRC in upstate New York, Krout and colleagues (2000) found that the most important general considerations in selecting a new residence were the availability of continuing care and the availability of on-site medical services. Less important were the proximity to family and friends, a desire to remain independent, the reputation of the facility, and freedom from maintenance. This study also found that the demographic factors of marital status, gender, education, age, and reported health status are selectively related to the reasons older adults give for moving from their primary residence, to the considerations they look for in a new residence, and to the aspects of a particular CCRC to which they ultimately moved.

Researchers investigating how physical design and organizational characteristics influence physical-activity levels among residents of 800 randomly selected nonprofit CCRCs found, not surprisingly, that communities offering more physical-activity opportunities and programming have comparatively more physically active residents (Harris-Kojetin, Kiefer, Joseph, & Zimring, 2005). Campuses in which management places importance on physical activity also have more physically active residents. Residents are more active in communities that have attractive outdoor features within walking distance (e.g., parks) and those with more extensive outdoor features (e.g., swimming pools, walking paths, and courtyards). These results indicate that CCRC residents value environments that support their efforts to engage in healthy behaviors, a trend that will become increasingly important as baby boomers become CCRC residents.

ROBYN STONE

See also

American Association of Homes and Services for the Aging
Assisted Living
Home Health Care
Long-Term Care Policy
Naturally Occurring Retirement Communities (NORCs)

Internet Resources

American Association of Homes and Services for the Aging
http://www.aahsa.org

Commission on Accreditation of Rehabilitation Facilities
http://www.carf.org

REFERENCES

Alperin, D., & Richie, N. (1990). Continuing/life care communities and the continuum of care. *Journal of Housing for the Elderly*, *6*(1–2), 125–130.

American Association of Homes and Services for the Aging (2005). *Continuing Care Retirement Communities: 2005 Profile*. Washington, DC: AAHSA.

Harris-Kojetin, L., Kiefer, K., Joseph, A., & Zimring, C. (2005). Encouraging physical activity among retirement community residents: The role of campus commitment, programming, staffing, promotion, financing and accreditation. *Seniors Housing and Care Journal*, *13*(1), 3–20.

Krout, J. A., Moen, P., Oggins, J., Holmes, H., & Bowen, N. (2000). Reasons for relocation to a continuing care retirement community. *Pathways Working Paper #00-04*, Ithaca, NY: Gerontology Institute, Ithaca College.

Ruchlin, H. (1988). Continuing care retirement communities: An analysis of financial viability and health care coverage. *The Gerontologist*, *28*(2), 5–15.

Sheehan, N., & Karasik, R. (1995). The decision to move to a continuing care retirement community. *Journal of Housing for the Elderly*, *11*(2), 107–122.

Sloan, F., Shayne, M., & Conover, C. (1995). Continuing care retirement communities: Prospects for reducing institutional long-term care. *Journal of Health Politics, Policy and Law*, *20*(1), 75–98.

Somers, A. (1993). Lifecare: A viable option for long-term care for the elderly. *Journal of the American Geriatrics Society*, *41*(2), 188–191.

CONTRACTURES

Epidemiology

Because activity and mobility are vital to the total health of the elderly, musculoskeletal problems that limit functional capacity have confounding effects. Physical changes thought to be associated with normal aging are all too often due to inactivity. Aging predisposes the elderly to development of contractures as a result of gradual but progressive loss of muscle bulk and subsequent formation of fibrous tissue. Contractures are defined as "an increased resistance to passive stretch of a muscle resulting from fibrosis of the muscles or joint or from disorders of the muscle fiber" (Fox, Richardson, McInnes, Tait, & Bedard, 2000, p. 364). A contracture can be the result of joint ankylosis and muscle shortening acting in concert or independently.

Development of contractures is precipitated by muscle inactivity, producing the so-called disuse syndrome that follows prolonged (more than 3 days) bed rest. The syndrome comes about as the negative effects of an imbalance between rest and physical activity and is characterized by decreased physical-work capacity, muscle atrophy, negative nitrogen and protein balance, cardiovascular deconditioning, pulmonary restrictions, and depression (Degens & Always, 2006). Immobilization results in a 3% loss of original muscle strength each day for the first 7 days; thereafter, the process plateaus. Inactivity of any kind leads to muscle atrophy and replacement of muscle bulk with noncontractile tissue. This is primarily due to lack of usual weight-bearing forces and decrease in the number and intensity of muscle contractions.

Etiology

Contractures are a major health concern for the elderly and are commonly the result of immobilization and disuse during hospitalization or residence in a long-term-care environment such as a nursing home. The 2005 Online Survey, Certification, and Reporting (OSCAR) system showed that nationally, 28.9%, or approximately 386,000 nursing-home residents across the United States, suffered from contractures (Harrington, Carrillo, & LaCava, 2006).

Causes of joint contractures can include immobility from illness, surgery, or neuromuscular disease. Several chronic neuromuscular and osteomuscular conditions common in the elderly predispose them to the development of muscle and joint contractures, including Parkinson's disease, osteo- or rheumatoid arthritis, and Alzheimer's disease (Degens & Always, 2006). Spasticity and muscular hypertonia associated with neuromuscular conditions often precipitate muscle immobility and contracture. In some patients, however, contractures potentiate spasticity. Thus, the pathophysiological mechanism creates a feedback cycle by which contractures and spasticity augment each other (Ada, O'Dwyer, & O'Neill, 2006).

Muscular weakness and loss of dexterity can lead to the development of contractures. For example, muscle contractures are observed as early as 2 months after a cerebrovascular accident. Contracture of the shoulder joint, or frozen shoulder, is often seen in poorly rehabilitated stroke patients. Adhesive capsulitis is also responsible for post-stroke arthropathies and resultant contractures of the ankles and hips.

Alzheimer's disease poses the greatest risk for contracture development. Despite late-developing motor-function disturbances, nearly one-quarter of the dementia patients studied had contractures in early or middle stages of the disease. More than three-quarters of Alzheimer's patients who had lost the ability to walk had contractures. At the end stage of Alzheimer's disease, it was exceptionally rare to find a patient without contractures of hips, knees, elbows, shoulders, and wrists (Souren, Franssen & Reisberg, 1995).

Dupuytren's contracture—the most studied and discussed contracture in medical literature because it is seen across all adult ages, including 10% to 15% of the elderly—is caused by fibroblastic proliferation in the fine structure of the palmar fascia, resulting in finger deformity. Of unknown etiology, it is seen in chronic alcoholism, diabetes mellitus, HIV, phenytoin therapy, and hemodialysis patients. The condition is painless and may be related to repetitive microtrauma.

Hip-flexion contracture—ambulating with the upper torso tipped forward—is more likely the result of prolonged or restrained sitting than an age-related change. Heel-cord contractures often result from the effect of gravity on an unsupported foot while in bed or a lounge-type chair. A high frequency of gait and postural abnormalities and hip-flexion contractures is observed among arthritic, ambulatory elderly patients who have adapted to their painful hips and spines; therefore, they do not report their discomfort to the clinician. Often, osteomuscular pain is accepted as an almost normal consequence of aging by both patients and their physicians. However, pain universally leads to the limitation of motion. As a painful disease progresses, the sites and intensity of joint contractures also increase. End-stage osteoarthritis of the hip results in limitation in external rotation, abduction, and flexion movement of the hip. This motion limitation invariably changes posture and gait and predisposes the patient to immobility and further progression of the hip contracture (Steultjens Dekker, van Baar, Oostendorp & Bijlsma, 2000).

Complications

Elderly patients and their caregivers often underestimate the degree of damage and complications that can stem from immobility. Complications from contractures range from aesthetically repugnant and psychologically disturbing body disfigurement to forced immobilization, increased dependence, and predisposition to pressure ulcers over affected bony prominences. Immobility itself has complications including not only muscular atrophy but also flexion contracture, body fluids and circulation alterations, postural hypotension, venous thrombosis, pulmonary embolus, respiratory difficulties, waste difficulties, and osteoporosis. When rest is recommended for an older person with functional limitations, this exacerbates disuse and initiates a downward spiral of decline.

Contractures and the ensuing immobility also increase the older adult's risk for pathophysiologic complications such as pneumonia and infections of the genitourinary tract precipitated by functional incontinence. Pain is another complication from contractures; however, it is often underreported and underassessed in nursing homes, particularly for those who are cognitively or communication impaired.

Implications for Health Professionals

The ability to care for self is the cornerstone of healthy aging. Whereas the majority of older adults live with chronic illnesses, the need for care often occurs with a functional decline. Functional decline is the inability to bathe, dress, toilet, and be mobile without assistance. Limitations in mobility such as contractures lend themselves directly to functional decline and loss of independence. For example, individuals who develop a contracture of an upper limb cannot feed self simply because they are unable to bring utensil to mouth. Lower-limb contractures impede walking or propelling self in a wheelchair (Steultjens et al., 2000).

The 1987 Omnibus Reconciliation Act (OBRA 87) requires facilities to ensure that residents who enter nursing homes without limited range of motion do not experience reduction in range unless the patient's condition demonstrates that such a reduction is unavoidable. One assessment requirement of OBRA, the Federal Minimum Data Set, is a potential source of data for identifying the association between risk factors for contractures and contracture formation and the related progression of each. The regulation further requires that a patient with limited range of motion receive appropriate treatment and services to increase range or prevent further decrease. In terms of regulatory oversight, some contractures are avoidable; as such, a contracture is a negative outcome of care that can be measured and used to judge the standard of care provided in an institution. Contracture risk assessment and avoidance must be an integral part of the community-based intake or institutional admission process.

There are also extrinsic factors (e.g., medical devices) that limit mobility and physical activity. Use of restraints, for example, is strongly associated with the consequences of immobility. Additionally, the natural history of contracture is sometimes associated with learned dependence that is unknowingly "taught" by caregivers, who anticipate and expedite the functional activities of daily living for the care recipient. In turn, volitional mobility is discouraged, disuse is advanced, and contracture formation is potentiated. The development of the Restorative Care Nursing Model is based on this premise and its goal is to optimize function for older adults and prevent sequelae of immobility (Resnick, 2004).

Effective preventive and treatment interventions for patients who have or are predisposed to contractures rely on collaboration among medical, rehabilitation, and nursing services. Medical oversight is needed for pain management and surgical consultation with regard to some forms of contractures. Patients may benefit from interventions provided by restorative nursing assistants, physical or occupational therapists, and physiatrists; and include such activities as walking, passive or active range of motion, soft-tissue manipulation, splinting, and botulinum toxin treatments.

Most contractures appear to be preventable and, if developed and detected in early stages, reversible. Unfortunately, once an older adult develops one or more contractures, the opportunity for functional performance diminishes. Thus, avoidance of prolonged immobility is essential to contracture development.

LAURA M. WAGNER
CAROLYN K. CLEVENGER
ELIZABETH A. CAPEZUTI

See also
Physical Therapists
Restraints

Internet Resources:

American Academy of Physical Medicine and Rehabilitation
http://www.aapmr.org/

American Physical Therapy Association: Section on Geriatrics
http://www.geriatricspt.org/

American Occupational Therapy Association
http://www.aota.org/

Association of Rehabilitation Nurses
http://www.rehabnurse.org/

Merck Manual of Geriatrics: Chapter 29: Rehabilitation for Specific Problems (Stroke)
http://www.merck.com/mrkshared/mmg/sec3/ch29/ch29c.jsp

University of Kansas: Research and Training Center on Independent Living
http://www.rtcil.org/products/RTCIL%20publications/Health%20Issues/SCI%20Joint%20Contractures.pdf

REFERENCES

Ada, L., O'Dwyer, N., & O'Neill, E. (2006). Relation between spasticity, weakness and contracture of the elbow flexors and upper limb activity after stroke: An observational study. *Disability & Rehabilitation*, *28*(13–14), 891–897.

Degens, H., & Always, S.E. (2006). Control of muscle size during disuse, disease, and aging. *International Journal of Sports Medicine*, *27*(2), 94–99.

Fox, P., Richardson, J., McInnes, B., Tait, D., & Bedard, M. (2000). Effectiveness of a bed positioning program for treating older adults with knee contractures who are institutionalized. *Physical Therapy*, *80*(4), 363–372.

Harrington, C., Carrillo, H., & LaCava, C. (2006). Nursing Facilities, Staffing, Residents, and Facility Deficiencies, 1998 through 2005. University of California, San Francisco. Available at http://www.pascenter.org/publications/publication_home.php?id=519

Resnick, B. (Ed.) (2004). *Restorative care nursing for older adults: A guide for all care settings*. New York: Springer Publishing Company.

Souren, L. E. M., Franssen, E. H., & Reisberg, B. (1995). Contractures and loss of function in patients with Alzheimer's disease. *Journal of the American Geriatrics Society*, *43*, 650–655.

Steultjens, M. P. M., Dekker, J., van Baar, M. E., Oostendorp, R. A. B., & Bijlsma, J. W. J. (2000). Range of joint motion and disability in patients with osteoarthritis of the knee or hip. *Rheumatology*, *39*, 955–961.

COPING WITH CHRONIC ILLNESS

Chronic illness is a common accompaniment of late middle and old age. Approximately 85% of people 65 years and older suffer from at least one chronic illness, the three most common diseases being arthritis, hypertension, and heart disease. Evidence suggests that older adults generally adjust better psychologically to the diagnosis of a chronic disease than do younger adults, presumably because of the acknowledgment and expectation that advanced age carries an increased risk for illness and disability (Settersten, 1997). For younger adults, serious illness and associated disability are particularly stressful because they are perceived as "off-time" events (i.e., not developmentally normative) and therefore assaults/insults to one's sense of self and social identity.

Nevertheless, for both younger and older adults, diagnosis of a chronic illness is likely to be a distressing event that inevitably disrupts their lives and elicits a range of psychological reactions (Miller, 1992). Most common is a loss of self-esteem as usual social involvements may become constricted and social roles curtailed. Patients' sense of self-worth is further undermined when the illness creates dependency on others. They may feel guilty about the demands their illness places on others or may experience fear that others will withdraw or abandon them to avoid the burden of caregiving. Guilt may also arise from having become ill, especially if their lifestyle choices (e.g., smoking, drinking, being inactive) are implicated in their disease, or it is seen as an outcome of being negligent about their health care. Physical limitations and loss of control over bodily functions may result in an increased sense of vulnerability and shame, both of which may lead to social withdrawal and isolation. Anger and depression are common psychological sequelae of having a chronic illness; however, they tend to be more pronounced among younger patients who perceive their plight as more age-inappropriate and thus unfair (Schnittker, 2005).

Whether older adults cope with stressors, including physical illness, differently from younger adults has received considerable research attention. Few differences have been found, but older adults appear to engage in less help-seeking and seem to exhibit a more stoical psychological acceptance of being ill. It remains unclear whether the few age-related differences in coping strategies that have been identified are a function of changes in the coping strategies individuals employ as they age or differences in the kinds of stressors people confront at different stages of life (Aldwin, Sutton, Chiara, & Spiro, 1996).

Coping Strategies

Attempts to master illness-related stressors (as with most kinds of stressors) typically include both problem- and emotion-focused coping strategies. Problem-focused coping involves action directed at removing or circumventing the stressor or gathering resources to confront it, such as seeking information and eliciting social support. Emotion-focused coping involves attempts to reduce or eliminate the emotional distress associated with or cued by the stressor through, for instance, positive reappraisal, minimization, distancing, and accepting responsibility. Emotion-focused coping tends to be used when the situation is not alterable and thus must be tolerated or endured. Given that the course of a chronic illness is often uncontrollable, emotion-focused strategies that enable a more favorable reappraisal of the illness and restore one's sense of control over life become particularly significant (Taylor, Helgeson, Reed, & Skokan, 1991).

Cognitive emotion-focused strategies commonly used to cope with the distress of chronic illness include redefining "doing well" and "being healthy," normalizing one's plight, engaging in downward comparisons, and finding positive meaning in the experience. These strategies constitute facets of cognitive restructuring that enable one to feel less victimized by the experience of becoming ill and minimize illness-related loses and threats.

Redefining "doing well" and "being healthy"

Redefining what it means to be "doing well" and "being healthy" often allows chronically ill patients to feel less ill and distressed and even contributes to their maintaining valued physical and social activities (Duke, Leventhal, Brownlee, & Leventhal, 2002). For example, patients may see themselves as healthy if their medical conditions are stable and they manage to avoid hospitalizations or unscheduled visits to the physician. Some patients may substitute a spiritual definition of well-being for a physical one. Others may construe "doing well" as staying involved in valued activities or preserving their prediagnosis daily routines. Still others who believe that physical and mental states are closely tied may be able to think of themselves as healthy by maintaining a positive mental state. In general, these strategies allow patients to experience a subjective sense of physical well-being despite the objective reality of living with a chronic or serious illness.

Normalizing their plight

When normalizing and universalizing suffering, patients reason that suffering is an inescapable aspect of life and that everyone is confronted with adversity in life. Embracing such a worldview minimizes the difference between themselves as patients and the healthy others, thus diminishing the sense of alienation and victimization that often accompany an illness diagnosis.

Engaging in downward social comparisons

Elders may compare their own illness to that of their peers or others with the same condition who seem to be more incapacitated, either medically or psychologically. They may even compare themselves to a hypothetical "other" patient who they deem to be worse off. Such downward social comparisons help restore one's self-esteem and sense of emotional well-being because patients feel less victimized by the illness and more in control of their situation. Self-reminders that "it could be worse" are emotionally reassuring and allow patients to view personal circumstances as less threatening.

Finding positive meaning in the experience

Being able to find a positive or constructive meaning in a negative life event such as a chronic illness contributes to subsequent psychological adjustment (Park & Folkman, 1997). Patients who interpret their illness in a way that allows them to reconcile it to their worldview and value system feel less victimized and less distressed. Thus, patients may claim that their illness made them appreciate the value of health, adopt a more positive lifestyle and, consequently, they feel "healthier" than before their diagnosis. Others may suggest that the illness-related challenges provided the opportunity to discover their personal strengths, thus increasing feelings of self-efficacy, or for family and friends to express their support, thus enhancing feelings of being loved.

Behavioral and Cognitive Adaptive Tasks

The incurable nature of a chronic illness reduces prospects of full recovery. Successful adjustment commonly requires the mastery of a number of adaptive tasks (Miller, 1992).

Modifying daily routines

Living with a chronic illness typically necessitates a change in one's daily routine to accommodate symptoms (e.g., fatigue, pain) or comply with treatment regimens and medical-care appointments. Patients often reorganize their daily lives so as to better conserve limited energy or minimize disruption of valued activities.

Mastering the information and skills required for self-care

Chronic illness, due to its protracted nature, often demands that patients adopt an active role in preserving their health and adhering to treatment. Patients must master considerable information and acquire competence in carrying out these self-care activities or rely on the assistance of family and friends.

Adhering to treatment regimens

Treatment regimens for chronic illnesses vary in their complexity and demands on the patient. Medication and dietary nonadherence is common among patients with chronic diseases regardless of age. Although such behavior may appear self-destructive or irrational to health professionals, research typically reveals that patients have their own rationale that accounts for their nonadherence. Attempts to reassert control, test their health limits, or preserve quality of life by avoiding distressing treatment side effects are often reasons why patients violate physicians' orders. At times, however, these behaviors can be a form of denial regarding the illness or its severity.

Coping with uncertainty

Chronic illnesses often follow an unpredictable trajectory, and treatment efficacy often varies by patient or over time. Patients live with considerable uncertainty regarding their conditions' stability, severity, and manageability. Uncertainty is inherently stressful and difficult to endure. Moreover, it is hard to establish an appropriate psychological and/or practical coping response when the manifestation and intensity of the stressors are unpredictable.

Maintaining a sense of control

Chronic illnesses can undermine patients' sense of control over health and life. Although a sense of control is viewed as a fundamental human need, there has been some debate whether this sense diminishes in late life. Common patient strategies for regaining a sense of control include acquiring knowledge about the illness, adopting alternative therapies to enhance one's health, adhering strictly to treatment regimens, construing as omnipotent one's medical provider, or turning over control of one's health to a Higher Power.

Preserving self-esteem

Latent negative self-images are often activated by chronic illness. Patients may feel vulnerable, helpless, incapacitated, and dependent on others. A lower self-esteem and even depression are common among the chronically ill elderly and often lead to social isolation and withdrawal. Patients may attempt to preserve or restore self-esteem through strategies such as downward comparisons, normalization or minimization of their plight, and the search for meaning in the illness experience. Strategies that enhance patients' sense of control over their illness or its symptoms that disrupt their lives can also enhance self-esteem.

Renegotiating social relationships

Chronic illness has both social and physical consequences. A patient's family and friends are also affected as they witness or are called upon to assist with the physical and psychological impact of the illness. Therefore, illnesses have both positive and negative interpersonal consequences. Distant or estranged family members may become closer and more supportive. Alternatively, the physical and emotional burden of caregiving may cause family members to resent the patient, feel guilty about such feelings, and even withdraw.

Several factors associated with aging may compromise coping with chronic illness. The typically attenuated social networks of older adults may reduce the availability of informal practical and emotional support. Limited financial resources may hinder access to medical care, formal assistance, and alternative therapies not covered by health insurance. Older adults' ability to acquire new knowledge and learn new skills necessary for managing their illness may be restricted. Finally, the common perception that illness and disability are inevitable consequences of aging may completely undermine older adults' motivation to employ coping strategies for preserving their health and well-being.

KAROLYNN SIEGEL
HELEN-MARIA LEKAS

See also
Chronic Illness

Internet Resources

Building Academic Geriatric Nursing Capacity
http://www.geriatricnursing.org/centers/

American Association for Geriatric Psychiatry
http://www.aagpgpa.org/

Eldercare
http://www.elderweb.com/home/

National Chronic Care Consortium
http://www.nccconline.org/

National Institute of Health, Senior Health
http://nihseniorhealth.gov/

REFERENCES

Aldwin, C. M., Sutton, K. J., Chiara, G., & Spiro, III, A. (1996). Age differences in stress, coping, and appraisal: Findings from the normative aging study. *The Journal of Gerontology*, *51B*, P179–P188.

Duke, J., Leventhal, H., Brownlee, S., & Leventhal, E. A. (2002). Giving up and replacing activities in response to illness. *The Journal of Gerontology*, *57B*, P367–P376.

Miller, J. F. (1992). *Coping with chronic illness: Overcoming powerlessness* (2nd ed.). Philadelphia: F. A. Davis, C. O.

Park, C. L., & Folkman, S. (1997). Meaning in the context of stress and coping. *Review of General Psychology*, *1*, 115–144.

Schnittker, J. (2005). Chronic illness and depressive symptoms in late life. *Social Science & Medicine*, *60*, 13–23.

Settersen, R. A. (1997). The salience of age in the life course. *Human Development*, *40*, 257–281.

Taylor, S. E., Helgeson, V. S., Reed, G. M., & Skokan, L. A. (1991). Self-generated feelings of control and adjustment to physical illness. *Journal of Social Issues*, *47*, 91–109.

CORONARY ARTERY DISEASE

Despite a recent decline in mortality due to cardiovascular disease, heart disease remains the most common cause of death in older persons. In fact, the majority of cardiac deaths in persons older than 65 are attributable to ischemic heart disease (Wei, 1999). Coronary disease may manifest as a chronic illness due to gradual obstruction of the coronary arteries or suddenly as an acute coronary syndrome.

Chronic Angina Pectoris

Clinical presentation

Throughout life, the coronary arteries gradually become obstructed by atheromatous plaque. Symptoms begin when the supply of blood through the artery can no longer keep up with the demand of the heart muscle. Symptoms usually first appear during exertion and eventually at rest. The majority of older patients suffering from clinical coronary artery disease present with angina pectoris, but certain nonspecific presentations of myocardial ischemia are more prevalent among elderly patients. These include sweating, palpitations, syncope with exertion, and episodes of confusion. Because typical cardiac symptoms may be absent, it is imperative to maintain a high level of suspicion for coronary artery disease when evaluating older patients. The vague and often unrecognizable presentation of myocardial ischemia in older persons may contribute to delays in seeking medical attention and in the establishment of a diagnosis.

Diagnosis

A comprehensive assessment of symptoms and risk factors will usually give the caregiver an overall sense of whether the symptoms are from cardiac ischemia or not. The diagnosis of angina pectoris begins with a careful history that should include (1) The characteristics of the discomfort—squeezing, tightness, and crushing qualities are more likely to be ischemia than are sharp or stabbing qualities; (2) the duration of the attacks—typical angina lasts for several minutes, and recurrent attacks that last for seconds or hours are less likely to be angina; and (3) the presence of associated symptoms—dyspnea, dizziness, diaphoresis, nausea, and palpitations are especially concerning. Symptoms that occur with exertion and relieved with rest are the most specific for angina.

The presence of acquired major cardiac risk factors such as hypertension, dyslipidemia, diabetes mellitus, and cigarette smoking should be elicited. Family history, which should be obtained, is nonetheless less important in the elderly population than acquired risk factors. A broad differential diagnosis for chest discomfort should be maintained when evaluating older patients because as they may have a wide range of other potential causes. Nonanginal causes that should be considered include esophageal disease, musculoskeletal pain, pericarditis, pulmonary embolism, aortic disease, cervical disease, varicella zoster, intra-abdominal events, and anxiety.

A physical examination should look for the presence of hypertension, valvular heart disease, congestive heart failure, and peripheral vascular disease. Laboratory tests for dyslipidemia and diabetes mellitus are appropriate. C-reactive peptide (CRP) is an emerging blood test for inflammation and elevated levels are associated with risk of myocardial infraction. CRP may be useful to risk stratify patients when other tests are inconclusive. CRP should be used with caution because any inflammatory state can elevate it, including infections, rheumatologic illness, and cancer. A resting electrocardiogram may show evidence of prior infarction, but it may be normal. A prior electrocardiogram is useful for comparison to look for any changes.

Stress testing can help establish the diagnosis of coronary artery disease, and several types of tests are available. Exercise-treadmill testing is the simplest test and is appropriate for patients with normal electrocardiograms who are able to exercise vigorously on a treadmill. In older patients, who may have abnormal baseline electrocardiograms or are unable to exercise, scintigraphic (nuclear) studies or echocardiography is often used to localize ischemic disease. For those older patients who are unable to exercise adequately, pharmacological stress testing is done using vasodilators, dipyridamole or adenosine, or with the beta agonist dobutamine to simulate exercise.

Two newer diagnostic tests using CT scans are being developed. Electron beam Computed Tomography (EBCT) measures the amount of calcified plaque in the coronary arteries and can predict risk of myocardial infarction and death. CT angiography can localize obstructive coronary artery disease. These newer tests are less established than stress testing in the workup and management of chronic coronary artery disease.

Treatment

The management of chronic angina pectoris includes a variety of medical, surgical, and interventional choices. The goals of therapy are to improve the patient's symptoms while maintaining a desired level of activity and to reduce cardiovascular risk factors.

Pharmacological options for the management of chronic angina pectoris in older persons are the same as for younger patients, but altered drug metabolism and excretion, polypharmacy, and a propensity for adverse drug effects in the elderly necessitate a careful approach. Initial drug doses should be low, with gradual titration. Close follow-up emphasizes monitoring for effectiveness and adverse reactions. Beta-blockers are effective antianginal and antihypertensives that have been shown to reduce mortality in patients with coronary artery disease. Nitrates can be effective at relieving angina. The degree of nitrate tolerance can be limited by incorporating a minimal 8- to 10-hour nitrate-free period every 24 hours in the regimen.

Antianginal therapy should be accompanied by cardiovascular risk factor modification. Hypertension should be appropriately managed. Dyslipidemia is most often treated with a statin. Particular caution must be paid to the side effects and multiple drug interactions of statins in the elderly (Vaughan & Gotto, 2003). Unless contraindicated, low-dose aspirin should be prescribed for patients with angina.

Smoking cessation, a low-fat diet, and a carefully planned exercise regimen should be recommended. A care plan should be formulated, with special attention to the older patient's emotional needs and support systems. Depression and social isolation should be identified and managed appropriately. In addition, proper patient education regarding the management of symptoms can help alleviate stress and anxiety.

Revascularization

Intervention using angioplasty and stents in older patients with coronary artery disease has become safer and more available. A growing number of patients undergoing percutaneous transluminal coronary angioplasty and coronary bypass surgery are now older than age 65. Although elderly patients experience higher mortality and complication rates with revascularization procedures, their outcomes can be excellent. Therefore, chronological age should not be a contraindication. Both angioplasty and bypass surgery should be considered in appropriate older patients who may derive significant benefit.

Acute Coronary Syndromes

Clinical presentation

The pathophysiology of unstable angina and myocardial infarction are due to sudden rupture of an unstable atheromatous plaque within a coronary artery (Libby, 2001). Resulting thrombus formation partially or completely occludes the artery and is a medical emergency. The clinical presentation of acute myocardial infarction in the elderly may vary widely, and the classic symptoms of chest pain and dyspnea may be absent. Atypical presentations observed in older persons include confusion, agitation, syncope, weakness, stroke, vertigo, cough, and abdominal pain. It is important for health care providers to gain familiarity with the broad spectrum of nonspecific symptoms that may represent myocardial infarction. In addition, older persons may have more silent myocardial infarctions (Tresch, 1998).

Diagnosis

The goals of the history and physical examination are to make an early presumptive diagnosis, identify early complications, and guide further evaluation and management. A careful history, including the nature and duration of symptoms, should be obtained. The symptoms are similar to chronic angina but with an acute increase in severity, frequency, and presence of symptoms at rest. The presence of antecedent coronary artery disease and cardiovascular risk factors should be determined. Findings of the physical exam in older patients may be nonspecific, as in younger patients.

The electrocardiogram may show ST segment elevations or depressions but may also be nonspecific or normal in the elderly. Cardiac-specific serum troponin I is the most widely used marker for acute myocardial infarction and is highly sensitive and specific. Serial measurements of troponin are collected over at least 24 hours to assess for infarction. Continuous electrocardiogram monitoring for arrhythmias is required.

Older patients suffering from myocardial infarction have higher rates of cardiac complications, including congestive heart failure, arrhythmias, cardiogenic shock, and ventricular and papillary muscle rupture. Echocardiography may be useful for assessing left ventricular function and for diagnosing valvular disease or complications such as papillary muscle tear or ventricular wall rupture. The elderly are also at risk for noncardiac complications, including delirium and pressure ulcers. In addition, older patients tend to experience higher in-hospital mortality rates and longer lengths of stay.

Management

The management of acute myocardial infarction in older persons should be prompt and aggressive when indicated. Advanced age is not a contraindication to the use of revascularization procedures, but physicians should be cognizant of the increased risks associated with these procedures in older patients.

Thrombolytic therapy has been reported to significantly reduce mortality in older patients presenting early during the course of a myocardial infarction. Although older patients may experience higher complication rates with thrombolysis, the relative benefit of therapy may actually be greater because of the higher mortality and morbidity in older patients who do not receive thrombolytic therapy. Several studies have demonstrated that elderly patients derive significant benefit from thrombolytic therapy (Rich, 1998).

Primary percutaneous transluminal coronary angioplasty is preferred to thrombolysis for the reestablishment of coronary perfusion. This approach is associated with excellent outcomes for older persons when performed in a timely fashion. Unfortunately, primary angioplasty is only available in specialized centers and treatment with thrombolytics should not be delayed while waiting for a patient to be transferred.

Antiplatelet therapy in the form of low-dose aspirin improves survival in older patients and should be initiated and continued. Clopidogrel is an alternative or can be used as an additional antiplatelet medicine. Beta-blockers have been associated with significant mortality reduction for older myocardial infarction patients. The use of angiotensin-converting enzyme inhibitors improves survival and cardiac function in the post–myocardial infarction period. Nitrates have been reported to be beneficial for older patients during myocardial infarction and may be particularly useful in the setting of congestive heart failure or hypertension. Aggressive treatment of cholesterol should be initiated as soon as possible, most often with a statin because this class has the greatest reduction of recurrent infarction and death.

Ambulation should begin early during the recovery period, with gradual increases in the level of activity. Prolonged bed rest and inactivity may place patients at risk for the development of venous thrombosis, pulmonary embolism, deconditioning, and skin breakdown. A slow and progressive exercise regimen, including adequate warm-up and cool-down periods, should be implemented.

A multidisciplinary approach is required when caring for older post–myocardial infarction patients. Cardiac risk factors should be identified and managed aggressively. The social and psychological aspects of elderly patient care should be emphasized because they have an important impact on recovery and subsequent rehabilitation. The presence of depression, social isolation, a lack of support systems, and an inadequate home environment should be identified and addressed optimally.

TIMOTHY DUTTA

See also

Chronic Heart Failure in the Elderly
Heartburn
Rehabilitation

Internet Resources

American Heart Association
http://www.americanheart.org

National Heart, Lung, and Blood Institute
http://www.nhlbi.nih.gov

REFERENCES

Libby, P. (2001). Current concepts of the pathogenesis of the acute coronary syndromes. *Circulation*, *17*, 104(3), 365–372.

Rich, M. W. (1998). Therapy for acute myocardial infarction in older persons. *Journal of the American Geriatrics Society*, *46*, 1302–1307.

Tresch, D. D. (1998). Management of the older patient with acute myocardial infarction: Differences in clinical presentations between older and younger patients. *Journal of the American Geriatrics Society*, *46*, 1157–1162.

Vaughan, C. J., & Gotto, A. M., Jr. (2004). Update on statins: 2003. *Circulation*, *110*(7), 886–892.

Wei, J. Y. (1999). Coronary heart disease. In W. R. Hazzard, J. P. Blass, W. H. Ettinger, J. B. Halter, & J. G. Ouslander (Eds.), *Principles of geriatric medicine and gerontology* (4th ed., chap. 47, pp. 661–668). New York: McGraw-Hill Publishing Company.

COUGH

The ability to cough is a part of normal lung function that helps to clear secretions and particles from the airways and reduces the risk of infection (Silvestri & Weinberger, 2005). Cough, however, can be disruptive to daily life and sleep and can lead to exhaustion, insomnia, incontinence, syncope, pain, headaches, hoarseness, pneumothorax, rib fractures, and concerns that something more serious is wrong. It is not surprising that cough is one of the most common symptoms for which patients seek medical advice. When a systematic approach is followed, effective diagnosis, treatment, and resolution of symptoms can be achieved in more than 90% of cases (Irwin & Madison, 2000).

The physiology of cough is complex. Cough receptors, which are found in many areas, can be stimulated by foreign bodies, smoke and environmental irritants, and inflammation. These receptors send signals across afferent nerves to the medullary cortex. Receptors found in the epithelium of the upper and lower respiratory tracts send signals via the trigeminal and glossopharyngeal nerves; those in the pericardium and diaphragm via the phrenic nerve; and those in the ear canal, esophagus, stomach, and pleura via the vagus nerve. The medullary cough center can also be stimulated by higher cortical centers and can be under voluntary control or inhibition. The efferent limb of the reflex stimulates the expiratory muscles, diaphragm, and the larynx, trachea, and bronchi to contract via the spinal motor, phrenic, and vagus nerves. To produce an effective cough, one must inhale to a high lung volume, close the glottis, contract the expiratory muscles to generate a high positive intra-thoracic pressure, open the glottis, and continue to contract the expiratory muscles (Fuller & Jackson, 1990; Silvestri & Weinberger, 2005.)

Acute cough is generally considered as lasting less than 3 weeks. Traditionally, the definition of chronic cough varied from 3 to 8 weeks. In more recent years, the term *subacute cough* has been proposed to describe cough lasting 3 to 8 weeks and chronic cough has been designated as lasting more than 8 weeks (Irwin, 2006). Although these cutoffs are arbitrary, the concepts of diagnosis and treatment for each remain clinically important.

Acute Cough

All cough begins as an acute cough. Although there have been no studies defining the incidence or causes, consensus statements suggest that the most common causes include upper respiratory infections (e.g., the common cold, allergic rhinitis, acute bacterial sinusitis), exacerbations of preexisting conditions (e.g., asthma, bronchiectasis, or chronic obstructive pulmonary disease [COPD]), *Bordetella pertussis* infection, and environmental irritants (Irwin, 2000). Recognition of pertussis infection in adults has dramatically increased in the last decades. Prevention of infection as well as reduction of disease severity can be safely accomplished with administration of pertussis booster vaccination to adults as well as children (Silvestri & Weinberger, 2005).

When an immunocompetent patient presents for evaluation, a thorough history and physical examination are essential. If the clinical assessment is suggestive of an acute respiratory illness, diagnostic testing is not usually indicated. In such instances, it has been shown that more than 97% of chest radiographs will be normal. Treatments should be based on clinical diagnosis and directed at the cause. The use of antibiotics should be reserved for patients with suspicion of a bacterial infection or for those with COPD exacerbations. Classical diagnostic signs and symptoms that accompany cough may not be present in the elderly, where acute cough can be a manifestation of pneumonia, left ventricular failure, asthma, aspiration of foreign matter, or interstitial lung disease (Irwin, 2000; Teramoto, 1999).

Subacute Cough

If a cough has persisted for 3 to 8 weeks and the history and physical examination are not suggestive of a postinfectious cause, one should follow an approach based on evaluation of chronic cough. Postinfectious cough is defined as cough following an acute respiratory tract infection that is not complicated by pneumonia. If cough is associated with wheezing or rhonchi, a chest radiograph should be performed and further evaluation for bronchial hyper responsiveness should be pursued. Initiation of inhaled bronchodilators and corticosteroids should be considered at this time, keeping in mind that cough variant asthma may be the diagnosis. If examination is suggestive of subacute bacterial sinusitis, computerized tomography (CT) sinus imaging is recommended because plain radiographs have a low diagnostic yield (Irwin, 2000).

Chronic Cough

Chronic cough is the fifth most common reason for outpatient office visits. A full assessment of cough requires a multidisciplinary approach and often may necessitate referral to a specialist. The *diagnostic triad*, consisting of asthma, upper airway cough syndrome (formerly known as postnasal drip syndrome), and gastroesophageal reflux disease (GERD) is responsible for nearly 94% of chronic cough in nonsmoking, immunocompetent patients. Other common conditions include chronic bronchitis, bronchiectasis, eosinophilic bronchitis, and medications such as angiotensin converting enzyme inhibitors, malignancies, sarcoidosis, and left ventricular failure. Less common causes include ear wax (i.e., “ear-cough,” or oto-respiratory reflex associated with the auricular branch of the vagus nerve), arteriovenous malformations, retrotracheal masses, tracheobronchomalacia, and pharyngeal dysfunction leading to aspiration. In 40% to 50% of cases, more than one factor may contribute to cough (Morice & Kastelik, 2003; Silvestri & Weinberger, 2005).

Diagnosis

A history and physical examination remain the first step in the diagnosis of chronic cough. Subsequent investigations include sputum evaluation, a chest radiograph, pulmonary function testing, CT sinus imaging, a high resolution noncontrast CT of the chest, and possibly bronchoscopy.

A trial of inhaled bronchodilators and steroids for at least a week may be helpful in treating cough. Bronchoprovocation testing can be falsely positive (especially in patients with GERD) and although it can effectively eliminate asthma as a diagnosis, it does not exclude all causes of steroid-responsive cough such as eosinophilic bronchitis.

Several conditions can lead to postnasal drip including allergic and vasomotor rhinitis, acute nasopharyngitis, and sinusitis. Clinical history, physical examination, and CT sinus imaging along with empiric therapies with antihistamines, nasal steroids, and nasal anticholinergic agents are the recommended approach to both diagnosis and treatment. It may take up to 2 weeks for symptoms to respond (Fuller & Jackson, 1990).

Studies including 24-hour esophageal pH monitoring and barium swallow have significant limitations and may miss the diagnosis. Empiric therapy with a proton pump inhibitor has been shown to be an excellent first line in the approach of diagnosing and treating GERD as a cause of chronic cough (Belvisi & Geppetti, 2004).

In the case of chronic cough, it is important to keep in mind that empiric therapy can often be substituted for specific diagnostic testing and that combination therapy is frequently required (Belvisi & Geppetti, 2004; Irwin, 2006).

Treatments

One can direct the treatment of cough against the underlying cause or against the cough itself. The most effective cough suppressants are centrally acting opioids such as morphine and codeine. These agents have well-known adverse effects including sedation, respiratory compromise, physical dependence, and gastrointestinal symptoms. Non-narcotic antitussives such as dextromethorphan and benzonatate are peripherally acting and available as over-the-counter (OTC) agents. Although they do not share the side-effect profile of opiates, they are overall less effective in cough suppression. Local anesthetics have transient antitussive effects but increase the risk of aspiration due to the associated oropharyngeal anesthesia. Menthol is another OTC treatment of cough. Although it does not cause local anesthesia, it is less effective at cough suppression. There is little evidence to support recommending most of the OTC cough remedies. Even studies that have shown a trend toward efficacy do not strongly suggest any clinical relevance (Belvisi & Geppetti, 2004).

Some evidence supports using anticholinergic agents such as ipratropium, especially following upper respiratory tract infections. New areas of drug development in cough suppression are focusing on newer generation opioids, inhibition of prostanoid synthesis and action, and ion channel modulators (Belvisi & Geppetti, 2004; Fuller & Jackson, 1990).

Special Considerations in the Elderly

There is a relative paucity of data that specifically address diagnosis and treatment of cough in the geriatric population. However, many factors that contribute to impaired cough reflexes in the elderly have been examined in the literature. These factors include strokes, advanced stages of Parkinson's disease, the use of sedating medications, and poor oral hygiene. Several studies have demonstrated that intensive oral care decreases dysphagia and improves cough reflex sensitivity in elderly patients. The literature suggests that improved oral care may contribute to lower rates of pneumonia leading to less morbidity and mortality as a result (Watando et al., 2004).

While cough can be a sign of dysphagia, not all patients with difficulty swallowing will have cough. Dysphagia is associated with increased aspiration and, along with sedating medications, is the strongest risk factors for developing pneumonia in the elderly. Patients with dysphagia should be managed using a multidisciplinary approach to decrease associated complications.

JUHAYNA KASSEM

Acknowledgments
This work was supported, in part, by the Will Rogers Memorial Fund, Los Angeles, CA.

See also

Chronic Obstructive Pulmonary Disease
Heart Failure Management
Heartburn

Internet Resources

American Academy of Family Physicians' Health Information
Familydoctor.org/handouts/237.html

American College of Chest Physicians
http://www.chestnet.org/patients/guides/cough/index.php

National Library of Medicine
http://www.nlm.nih.gov/medlineplus

REFERENCES

Belvisi, M. G., & Geppetti, P. (2004). Cough 7: Current and future drugs for the treatment of chronic cough. *Thorax*, *59*, 438–440.

Fuller, R. W., & Jackson, D. M. (1990). Physiology and treatment of cough. *Thorax*, *45*, 425–430.

Irwin, R. S., & Madison, J. M. (2000). The diagnosis and treatment of cough. *New England Journal of Medicine*, *343*(23), 1715–1721.

Irwin, R.S., et al. (2006). Diagnosis and management of cough. Executive summary. ACCP Evidence-Based Clinical Practice Guidelines. *Chest*, *129*, 1S–23S.

Morice, A. H., & Kastelik, J. A. (2003). Cough 1: Chronic cough in adults. *Thorax*, *58*, 901–907.

Silvestri, R. C., & Weinberger, S. E. (2005). Evaluation of chronic cough in adults. In B. D. Rose (ed.), *UpToDat*e. Wellesley, MA: Up to Date, Inc.:

Teramoto, S. (1999). Clinical significance of cough as a defense mechanism or a symptom in elderly patients with aspiration and diffuse aspiration bronchiolitis. *Chest*, *115*(2), 603.

Watando A, Ebihara S, Ebihara T, Okazaki T, Takahashi H, Asada M, Sasaki H. (2004). Daily oral care and cough reflex sensitivity in elderly nursing home patients. *Chest*, *12*6, 1066–1070.

CREATIVITY

Creativity is a powerful source of growth that is vital throughout life as we continually create and re-create ourselves. It is an attitude, an activity, and a philosophy about growing older that knows no age boundaries. For the aging individual, creativity may reflect a response to the uncertainties, losses, and challenges of existence. Creativity can continue until death; it is not necessarily tied to chronological age but rather to the process of self-actualizing one's creative potential (Simonton, 1998).

An obstacle in the discussion of creativity and aging, particularly in the conduct of research, has been establishing its definition. Rollo May's definition that creativity is "the process of bringing something new into being" (1975, p. 39) is both simple and encompassing. The domains of creativity include not only the creative arts but also social creativity and what gerontologist Gene Cohen (2000) calls the distinction between creativity with a big "C" versus creativity with a little "c." Creativity with a big "C" refers to the more sweeping accomplishments that can change a community or a society, whereas creativity with a small "c" refers to those accomplishments that can change a family's or individual's life course.

In one study, older adults who participated in arts programming over 35 weekly meetings had better health, fewer doctor visits, used fewer medications, were less depressed and lonely, had higher morale, and were more socially active compared to a control group (Cohen, 2005). Participation in these community-based arts programs impacts both health promotion and disease prevention, which in turn support independence. The study results are further explained in that participation in arts programs gave participants a sense of mastery and control, social engagement, and relationship-building, and that the engaging nature of art provided sustained involvement.

Creativity and creative expression can be stimulated and nurtured in older adults through their involvement in the creative arts: music, dance, theater, writing, and visual arts. This includes the folk or traditional arts, which are anchored in and expressive of shared ways of life, ethnic heritage, and religion. Examples of creative activities include Ukrainian egg-decorating traditions, American Indian beading and basketry, and old-time fiddling. The arts offer possibilities for increased self-esteem, socialization, learning, integration, mastery, joy, and self-discovery.

The inspiration provided by the creative arts can also increase life satisfaction and quality of life for the well to the frail elderly. A theater and writing project called Timeslips conducts sessions with people who have Alzheimer's and related dementia at adult day centers. A visual image such as a cowboy playing a banjo with a horse leaning over his shoulder, three smiling women playing the accordion, or a small girl standing next to a huge elephant is presented to the group. Participants are asked questions based on the image, and their answers are built into stories that give a glimpse into the experience of living with dementia. A person with dementia who never spoke more than two words at a time sang a solo of “Beautiful Blue Eyes” to a stunned audience after participating in the workshop. This creative process not only provides opportunities for self-expression but also provides staff and caregivers with new vehicles to reach those with dementia.

Principles of Creativity

Self-expression is a basic need throughout the life span that affects overall health, joy, and well-being. Jung (1971) regarded imagination and creativity as healing forces, whereby deep-seated feelings could be symbolically represented and released through the creative act. The creative arts are an opportunity for self-expression, achievement, and reengagement amid losses, voids, and uncertainty.

Clinicians must probe to find out about an older adult’s interests, past work, or hobbies. A “creativity assessment” can include these questions: What makes you feel most alive? What projects have given you the most pleasure? What skills do you have that you would like to pass on? What are your sources of imagination? Are there creative issues in your life that are troubling you now? How would you like to express yourself creatively? Engaging an elder in painting, writing a poem about turning 80, working on a pottery wheel, joining a discussion, moving to the beat in a dance class, or expressing sorrow when listening to a musical piece are ways out of isolation.

The creative arts can help stimulate and compensate for sensory loss—the “thinning of life”—through one-on-one or group activities, working with each sense separately, or as a total sensory experience. There is a natural pathway from sense memory to life review that transforms sensory-inspired stories into reminiscence and art. The University Without Walls is a telephone-conference-call program for home-bound older adults. Taught by volunteers, the classes include Short Stories, Poetry, Play Reading, Dramatic Literature, The Artist’s Way, Insights Into Opera, Film Studies, Women Artists, and 20th-Century Art. Staff members connect participants to the conference call. Classes generally last 50 minutes and meet for 4 to 12 weeks, during which time they provide opportunities for stimulating conversation, discussion, friendship, and lifelong learning.

Creativity may be used as both a strategy for reducing loss and a tool for problem solving. In his later-life poetry, William Carlos Williams wrote of “an old age that adds as it takes away.” (Cohen, 2000) Loss can be a catalyst for creative expression. Matisse had diminishing vision and suffered from severe intestinal disorders; he created from his wheelchair. Monet continued painting into his 80s following two cataract operations.

The Connecticut Hospice Program offers an exceptional arts program for older adults that specifically addresses loss through the creative arts. Art activities for hospice patients range from bedside art to evening concerts, from home-care arts to ongoing exhibits in the main gallery. Hospice-employed artists are oriented to the hospice program, are directly involved with patients and families at the bedside, and are core members of the caregiving team. The hospice program was the first to offer a model for arts in hospice care, resulting in the inclusion of arts in the Connecticut State Health Code—the first time arts were integrated by law into a health care program. All arts program activities are recorded in patient charts and discussed as part of the patient assessment.

Many older adults are the keepers of cultures and traditions. Their lives are their life stories—rich natural resources of experience and wisdom. Elders Share the Arts has created Generating Community, a model intergenerational program that brings together older adults in nursing homes, community centers, and senior centers with youths age 5 to 18. For example, teenagers from the Dominican Republic were trained to explore turning points in life. They interviewed older adults about their work histories and how the elders felt about their jobs when they were younger. This process provided the teenagers with role models for solving problems and making decisions in their own life. The exciting new area of creative rituals can be used to help mark significant events in a lifetime. These rituals, as developed by the Transitional Keys program, acknowledge celebrations, losses, and transitions that occur as people age, such as losing a driver’s license, getting a walker, losing a limb, transferring property, and entering a nursing home. Age markers and celebrations or rites of passage have been created for people turning 50, 60, 70, 80, 90, or 100. The basic structure of ritual is its theme, acknowledging the turning point, marking the event, naming the losses, telling the stories, developing strategies for compensation, and sharing with a community. Elements might include changing the environment through lights, smell, and sound and using props, music, masks, and food.

A ritual about losing a driver's license might involve bringing a group together to acknowledge the loss of the ability to drive and identify alternatives to compensate for that loss. During a driver's license ritual, participants can share stories about cars they have had, trips they have taken, and other significant "car moments." The grief and fear surrounding loss of a driver's license can be discussed, and the group can develop creative solutions to compensate for the loss of mobility, such as friends giving IOUs for car trips to doctors and the grocery store and money for taxicabs.

Clinicians should strive to recognize older adults for the creative individuals they are and bring art and creativity to their practices.

ANDREA SHERMAN

See also

Activities of Daily Living
Intergenerational Care
Life Review

Internet Resources

Elders Share the Arts
http://www.artswire.org/Community/highperf/hp/hpstories/ESTA.html

National Center for Creative Aging
http://www.creativeaging.org/

Transitional Keys
http://www.Transitionalkeys.org

The Poetry of Aging
http://www.gen.umn.edu/faculty_staff/yahnke/poetry/poetry6.htm

University Without Walls
http://www.dorotusa.org/seniors/university_walls.htm

REFERENCES

Cohen, G. D. (2000). *The creative age*. New York: Avon Books.

Cohen, G. D. (2005). *The mature mind*. New York: Basic Books.

Jung, Carl. (1971). *The portable Jung*. New York: Viking Publishing Company.

May, R. (1975). *The Courage to Create*. (p.39) New York: WW Norton and Company.

McLeish, J. A. B. (1976). *The Ulyssean adult*. New York: McGraw-Hill Ryerson Limited.

Sherman, A., & Weiner, M. B. (2004). Transitional Keys, a guidebook: Rituals to improve quality of life for older adults. New York: Transitional Keys.

Simonton, D. K. (1988). Age and outstanding achievement: What do we know after a century of research? *Psychological Bulletin*, *104*, 251–267.

CRIME VICTIMIZATION

Prevalence and Epidemiology

Among all demographic groups stratified by age, older adults have the lowest prevalence of crime victimization. The National Crime Victimization Survey (NCVS), a nationally representative sample of household residents in the United States conducted by the Bureau of Justice Statistics, found an annual incidence rate in 2004 of 2.1 violent crime victimizations per 1,000 individuals older than age 65 (http://www.ojp.usdoj.gov/bjs/glance/tables/vagetab.htm). In contrast, the highest prevalence of violent victimization was estimated for individuals between the ages of 16 and 19 with an annual incidence rate of 46 per 1,000, representing a 20-fold increase in risk over their older counterparts.

However, these findings obscure other troubling aspects of crime in older people. First, although rates of crime generally have been falling over the past 2 decades, and although older adults had the lowest risk of crime victimization among all demographic groups, their rate of victimization exceeded rates of elder abuse, calculated as 3.2 per 1,000, since turning age 65 per year in the most commonly cited study (Pillemer & Finkelhor, 1988) by over sevenfold. An 11-year longitudinal study of 2,321 community-dwelling older people found that 393 (16.6%) were seen by police over follow-up because of reported crime victimization (Lachs et al., 2005). Second, a more detailed analysis of NCVS data by gender and crime type conducted by the authors reveals very disturbing trends (Bachman, Dillaway, & Lachs, 1998), which are described herein.

Crime Victimization Among Older Adults: A Closer Look

Several aspects of victimization in older adults are alarming. In the NCVS data, older victims of robbery, particularly women, were more likely than younger victims to sustain injuries, and injured elderly victims of violent crime were more likely than younger injured victims to suffer a serious medical injury that required hospital or other medical care. This may reflect an underlying loss of physiologic reserve known to accompany normal aging, which may place the older person at greater risk for significant trauma. For example, given equivalent assault force to an extremity, an older woman with osteoporosis is more likely to sustain a fracture than her younger counterpart.

Other important differences in older crime victims point to contextual characteristics of the crime. For example, older victims of crime were more likely to face multiple offenders as well as offenders with guns. Younger homicide victims were more likely to be killed by known offenders, whereas older adults were just as likely to be killed by a stranger as by someone they know (Bachman, 1992; Bachman & Saltzman, 1995).

This pattern of victim/offender relationship is also present in nonfatal violence against the elderly. For example, whereas women under the age of 65 were more vulnerable to violence perpetrated by nonstrangers compared to strangers, women older than the age of 65 were just as likely to be victimized by a stranger as by an intimate or another offender known to the victim. And, finally, regarding location of victimization, elderly violent-crime victims were more likely to be assaulted at or near their home compared to younger victims (Bachman et al., 1998).

Recent research has also shed light on risk factors for crime victimization among older people (Lachs et al., 2005). The stereotype of the older crime victim as frail and impaired is simply incorrect. On the contrary, functional independence and better health status appear to be risk factors for victimization, probably because high-functioning older people are more able to venture into an environment that places them at risk.

The Impact of Crime on Health in Older Adults

Every clinician involved in the care of an older person can recall the patient/client who suffered a loss of physical and or psychosocial well-being after crime victimization. Slowly emerging data now suggest that such victimization is indeed morbid. For example, in a study that followed members of the New Haven EPESE cohort (a community-based study of 2,812 older people followed for more than a decade), those who experienced violent-crime victimization were at an independent increased risk of nursing-home placement (Lachs et al., 2006). Many of these individuals were ostensibly well compensated in all spheres (i.e., medical, functional, and psychosocial) after experiencing a crime, but victimization set in motion an inexorable spiral that ultimately resulted in loss of independence. For those people who are not well compensated, this spiral is only worse. These cases are striking not only for their trajectory but also for how sometimes "minor" victimization can insidiously erode quality of life.

The notion that a single event might set into motion a progressive spiral of decline in many domains for an older adult has a basis in aging theory. Normal aging is accompanied by a loss of physiologic reserve in various systems that need not lead to phenotypic decline. Rather, when the organism is taxed through stress, illness, or other factors, this loss of physiologic reserve is unmasked. Clinicians skilled in geriatric medicine encounter the effects of this disequilibrium on a daily basis: the ostensibly high-functioning older adult who develops new incontinence with simple pneumonia; the patient with mild cognitive impairment who develops alarming confusion with the addition of a medication; or the compensated older person who declines medically after bereavement.

Crime victimization may be such a precipitating event in the life of an older person. It is a stressful experience that may impact on physical health, mental health, and functional independence.

The Role of Multidisciplinary Providers in the Care of Victimized Older Persons

Given the paucity of research in this area, what is the clinician's role in the care of an older person who is a victim of crime? Is it simply to treat lacerations and abrasions, or should health care professionals play a more aggressive role in these situations? Or is crime simply not within the purview of the clinician?

We favor the more aggressive stance. A fundamental tenet of gerontology is that medical and social problems conspire to threaten the independence of the older person. Whether such a functional spiral is provoked by an acute medical illness such as shingles or an acute social problem such as robbery is ultimately moot. The outcome of such provocation is undeniably medical, undeniably quality-of-life depleting, and undeniably costly when independence is lost.

Besides caring skillfully for acute illnesses, clinicians should recognize that the older person who experiences crime is vulnerable in a great many ways. Elders with chronic diseases that have been well controlled may decompensate for physiologic reasons or because psychological factors related to crime may result in noncompliance or self-neglect. Although data are lacking, older crime victims are probably at risk for psychic distress in a great many ways, ranging from major depressive disorders to post-traumatic stress syndrome. These should be screened for and aggressively treated if identified. Support groups for victims of crime may be useful in this regard, although the issues for older crime victims may be somewhat different from those for younger ones, and the authors are unaware of support groups geared specifically to the older individual. Social isolation because of the fear of recurrent crime victimization is also a concern. Specific inquiries should be made regarding the size and quality of social interactions—for example, maintenance of previously cherished hobbies and activities after crime.

Clinicians should also not be lulled into complacency because victimization is perceived as "minor." For many older adults, an episode of victimization, such as burglary, seems trivial because little was stolen, there was no contact with the perpetrator, and insurance was available to replace stolen items. Yet, despite an initial complacent response, a dramatic decline ensued.

Economic Predation of Older Adults

The subject of financial exploitation of older adults by intimates or "con artists" deserves special mention because its prevalence is believed to be increasing. Additionally, the high prevalence of cognitive impairment, diagnosed or not, among older people makes them especially vulnerable. Clinicians may become aware of exploitation when an older person or a family member describes it frankly to them, or other aspects of the clinical presentation make it clear something is amiss in the finances of the older person (e.g., not purchasing medicines that were previously affordable).

Here, the clinical evaluation involves an assessment of cognitive status and may include the clinician recommending guardianship with respect to finances if decision-making capacity is impaired. Consultation with a neuropsychologist should be considered. Susceptibility to economic predation in the context of dementia itself may be evidence of impaired decision-making capacity if, for example, the older person chooses to pursue sweepstakes entries rather than purchase insulin.

Appropriate legal authorities (e.g., local law enforcement or district attorneys) should be involved where appropriate. Educating older citizens on how to identify culprits and resist their overtures is a role played by many senior centers and elder advocacy agencies.

Mark Lachs
Ronet Bachman

See also

Adult Protective Services
Elder Mistreatment: Overview
Elder Neglect
Financial Abuse

Internet Resource

Bureau of Justice Statistics
http://www.ojp.usdoj.gov/bjs/

REFERENCES

Bachman, R. (1992). *Crime victimization in the city, suburban, and rural areas* (Report No. 135943). Washington, DC: Bureau of Labor Statistics, U.S. Department of Justice.

Bachman, R,. Dillaway, H., & Lachs, M. S. (1998). Violence against the elderly: A comparative analysis of robbery and assault across age and gender groups. *Research on Aging*, *20*, 183–198.

Bachman, R., & Saltzman, L. (1995). *Violence against women: Estimates from the redesigned survey* (Report No. 154438). Washington, DC: Bureau of Labor Statistics, U.S. Department of Justice.

Lachs, M., Bachman, R., Williams, C. S., Kossack, A., Bove, C., & O'Leary, J. R. (2005). Older adults as crime victims, perpetrators, witnesses, and complainants: A population-based study of policy interactions. *Journal of Elder Abuse and Neglect*, *16*, 25–40.

Lachs, M., Bachman, R., Williams, C. S., Kossack, A., Bove, C., & O'Leary, J. R. (2006). Violent crime victimization increases the risk of nursing home placement in older adults. *The Gerontologist*, *46*(5), 583–589.

Pillemer K, Finkelhor D. (1988) The prevalence of elder abuse: a random sample survey. Gerontologist, 28(1):51–57.

CULTURAL ASSESSMENT

Culturally sensitive health care can improve health care delivery to all older persons and reduce continuing disparities in health outcomes. In clinical settings, cultural assessment is used to determine best approaches to care, improve patient satisfaction, and optimize adherence to treatment regimens. In geriatrics care, the clinical merit of understanding psychosocial factors is well established; clinicians routinely address complex physiological, psychological, and social issues in treating older persons.

Culture encompasses such a broad range of beliefs, behaviors, and definitions that the notion of conducting an assessment seems daunting. Although a symbolic construct through which social life is patterned, acted, and perceived, culture can be observed as enactment and outcome of behaviors in a changing environment and throughout the life span. There is a dynamic, adaptive quality to this "cognitive map"; cultures are not static. Texts describing cultural patterns should be used with caution. Broad, heterogeneous categories—such as Asian/Pacific Islander, which represents more than 25 ethnic groups, some from the same countries of origin—do not meaningfully reflect intragroup or individual variation in ethnicity and life experience. The cultural patterns discussed here as examples describe a range of beliefs. As in any clinical situation, the focus should be on the individual; stereotyping should be avoided.

Providers should be aware of the cultural and historical experiences of their older patients when determining their health care expectations for cure, treatment, palliative care, or reassurance about particular conditions. Because practitioners and clients may not share the same perception of illness, their expectations for health care may also vary. Older rural African Americans, as well as older Filipinos and older Mexican Americans, may conceive of health as an attribute of personal spirituality. African Americans may believe that prayer and faith are more significant than preventive health measures. Filipinos and Mexican Americans may perceive poor health as punishment or as the result of malevolent witchcraft. These perceptions suggest that illness should be tolerated until its impact on function is too severe for informal care. Coping skills developed over a lifetime in response to racism or other inequalities may hinder evaluation and diagnosis. These include reluctance to divulge information, especially about alternative therapies or dissatisfaction with Western biomedicine. Whereas geriatricians typically seek information about social support for patients, clients may not envision themselves as the center of a family or community support network. Allocentrism—emphasizing the importance of the group over the individual—is a common cultural value shared by many older Hispanics and Asians. The notion of autonomy in decision making is not universal.

Culture-bound syndromes have received attention, although their significance is not well understood. Cultural norms define illness and its expression. For example, among Western Europeans, there is a higher frequency of stomach ailments among Germans, liver ailments among French, and headaches among English. Hispanics might describe shortness of breath as fatigue (*fatiga*), back pain as a kidney pain (*dolor de los rinones*). Asian Pacific Islanders might complain of a "weak kidney" to indicate sexual dysfunction because the kidney is believed to be the site of libido. Native Americans might describe stress in their family support system as the patient having a "bad heart," indicating the lack of harmony with caregivers. Whereas patients experience illness as a cluster of symptoms that affect functioning in the social context of their daily lives, physicians tend to redefine symptoms as disease, devoid of social context. Recognition of the culturally mediate experience of poor health is a significant element in a culturally sensitive patient interview.

Conducting Cultural Assessment and Reducing Access Barriers

Health care providers often do not have the time or the training to conduct a comprehensive assessment during a single encounter. As with other diagnostic tools, cultural assessment is linked to the level of care and professional domain. Physicians use cultural assessment to inform their evaluation of symptoms, choice of screening instruments, discussion and selection of treatment options, care plans, advance directives, and placement options. Nurses and other allied health professionals use cultural assessment to implement care plans, assess health status and pain, respond to personal-care issues, and provide appropriate emotional and spiritual support to patients and families. Psychosocial assessment of patients in the context of their families and communities is a core social-work skill. Care planning is based on an assessment of beliefs about disease, efficacy of treatment, and potential for rehabilitation, as well as the impact of disease on quality of life.

The basic elements of cultural assessment, asked or observed, include personal and medical history, health practices and preferences, information needs, and communication styles. Personal history includes place of birth, length of residence in the United States if foreign-born, economic status, major support systems, ethnic affiliation and strength of that association, and religious beliefs and importance of those beliefs to daily life. Clinicians should assess the type, depth, and complexity of information a patient wishes to be told and by whom. Dietary preferences, prescriptions, proscriptions, and lifestyle changes should be noted with respect to their potential conflict with cultural values. Differing values about the appropriateness of informal home care or institutional care for specific conditions (e.g., cognitive impairments, incontinence, advanced age) may have to be explored. Communication styles include primary and secondary language, speaking and reading levels, print and oral traditions, and nonverbal expression. Patients' descriptions of symptoms using culture-bound references may need to be interpreted, even if the provider and patient speak the same language. When translators are used, clinicians should speak in short phrases and use simple, nontechnical language. To ensure the accuracy of the translation, the interpreter should report the patient's words exactly; accuracy can be checked by asking the patient to repeat the information or instructions and by monitoring nonverbal communication (e.g., facial expression, body language). When a family member is used as a translator, the purpose of the session should be discussed beforehand with the translator to ascertain his or her comfort level with sensitive topics (e.g., anatomical function, especially across gender and generations; bad news). In some cases, a more appropriate relative or a professional interpreter should be found.

A culturally sensitive medical history and examination do not differ from any thorough examination. The art of patient interviewing may diverge from the structured medical model if patients voice multiple complaints or divulge important symptoms only at the conclusion of the interview. Past medical history should be thoroughly reviewed and discussed. Foreign-born patients may have been exposed to treatment strategies that are not familiar to U.S. physicians, and patients may not have access to the same information about diseases in their countries of origin. Medications that are well controlled in the United States may be sold over the counter or prescribed with few safeguards in other countries. Histories of drug allergies may be more complex to elicit from foreign-born elders. Clinicians may need to schedule several visits before a trusting relationship is established.

Effective communication is always key to good patient care. Cross-cultural barriers to access often occur unintentionally. At a first meeting, clinicians may habitually introduce themselves, shake hands firmly, and promptly determine the reason for the patient encounter. In some cultures, this businesslike attitude would be offensive. Native Americans, for example, would likely prefer a light touch to an aggressive handshake. In other cultures, traditional (i.e., indigenous or folk) medicine incorporates the healing arts of counseling and talk therapy. Patients from diverse cultures relate that their traditional doctors "really know them as a person"; they feel distrustful of an abrupt and impersonal approach.

Patients' expressions of respect may be misinterpreted by providers. Avoidance of direct eye contact is a common form of respect shown by Native Americans, Mexican Americans, and African Americans and should not be interpreted as furtiveness or untrustworthiness. Giving respect and feeling distrust may overlap, as when an African American patient avoids direct disagreement with a doctor's recommendations. Silence and failure to report adverse reactions or unsatisfactory responses to treatment may simply be a way to respectfully avoid direct confrontations, or it may be the patient's way to shield the clinician from the humiliation associated with treatment failure. Silence may indicate respect, acknowledgment of the discourse, or an opportunity to carefully weigh a response. It does not necessarily indicate discomfort or anger and should be an expected element in pacing an interaction. The clinician may carefully schedule patient care by the clock, but many cultures do not share a similar orientation to time. This may be due to practical difficulties of arriving at a destination at an exact time or to the irrelevance of exact timing to most activities. Clinical questions about a symptom's occurrence, intensity, and effect on the patient and his or her social life may initiate a discussion about cultural values. In addition to avoiding harm in the physician–patient relationship, learning about cultural norms can be an enjoyable aesthetic experience for providers.

Simple forms of etiquette are effective. Most cultures afford respect to elders as well as to health care practitioners. Treating clients with respect may be indicated by appropriate terms of address, such as "Mrs. Brown" rather than a first name or a term of endearment. Personalized relationships are important to many cultures and are established through noncommercial transactions. Clients may offer food or other token gifts to reduce the formal barrier and create a more personal relationship; refusal would be treated with suspicion. Establishing this type of relationship may also be accomplished by the provider offering a personal disclosure, such as initiating a conversation about a mutual interest (which may entail responding to personal questions), to reduce communication barriers. Clinicians should avoid any temptation to relate to clients of different cultures by using terms that are not in their own vocabulary, such as speaking Black English to African American elders or using putative honorifics that may actually be offensive, such as "chief" to a Native American. Clinicians may adjust their medical and anatomical vocabulary to the patient's education and language, but they need to check that the information provided is understood.

Advance Directives and End-of-Life Care

In a multicultural society, concern for justice brings ethical issues to the fore. Most of the literature on cultural assessment of elderly persons in the United States relates to significant differences among ethnic and cultural groups on the completion of advance directives (ADs) and end-of-life decision-making strategies. For example, African Americans tend to want all possible life-sustaining treatments; they distrust ADs and see them as authorizing neglect or inferior care based on racial and socioeconomic factors. Korean Americans may voice a personal wish for a natural death (i.e., no life-prolonging technology) but expect their children to insist on all possible life-saving measures. Cultural-assessment strategies use the same principles as any other medical encounter of effective communication, recognition, and sensitivity to cultural variation and may include assessment of the family attitudes and practices as well (Crawley, Marshall, Lo, Koenig, & the End of Life Consensus Panel, 2002; Ersek, Kagawa-Singer, Barnes, Blackhall, & Koenig, 1998; Hepburn & Reed, 1995; Hornung, et al., 1998; Kagawa-Singer & Blackhall, 2001).

To set the context for ethical decision making, clinicians need to ascertain whether patients are reluctant or responsive to discussing end-of-life care. In addition, clinicians should attempt to understand beliefs about death, spiritual issues associated with dying, the nature of the social support system, and attitudes of patients and their families toward the health care system. In many cultures, the direct, frank, structured discussions of death implied in ADs and end-of-life care planning are considered harmful to the patient's well-being, insinuate hopelessness, increase suffering, and hasten the inevitable outcome. Among Native Americans, for example, the issue is best addressed indirectly, talking about others who have died (using a referent term rather than the personal name) to elicit responses about what would constitute a "good death." Clinicians who can address these issues over time are more likely to reach an understanding of their patients' wishes.

Concepts of autonomy vary and imply different norms in the disclosure of information and decision making. Ethiopian and Persian immigrants believe that bad news should be conveyed to the patient by a family member or close friend, not by a health care provider. In these circumstances, doctors confront the dilemmas of concealment of information, truthfulness in diagnosis or prognosis, and protection of patient confidentiality. Some physicians manage the problem by asking patients how much information they want to know, who else should be informed, and who they want to make decisions with or for them. Another strategy is to encourage patients to ask questions over several visits in order to absorb information.

The role of decision maker varies with cultural norms. Daughters might be the first choice among Hispanics and African Americans, sons among Asians, and spouses among Anglo-Europeans. In general, Native American cultures strongly support autonomous decision making, and children are unlikely to interpose their wishes. However, if an elder is without capacity, a family spokesperson would likely emerge to represent the elder's authentic wishes. Clinicians should avoid directing information to and expecting decisions from the best-educated family member; this person may not necessarily be culturally empowered with decision-making authority.

B. Josea Kramer

See also

Communication Issues for Practitioners
Cultural Competence and Aging

Internet Resources

Center for International Rehabilitation Research Information and Exchange
http://cirrie.buffalo.edu/monographs/index.html

Program for Multicultural Health (PMCH) at the University of Michigan Health System
http://www.med.umich.edu/multicultural/ccp/assess.htm#assessment

REFERENCES

Crawley, L. M., Marshall, P. A., Lo, B., Koenig, B. A., & the End of Life Consensus Panel (2002). Strategies for culturally effective end of life care. *Annals of Internal Medicine*, *136*, 673–679.

Ersek, M., Kagawa-Singer, M., Barnes, D., Blackhall, L., & Koenig, B. A. (1998). Multicultural considerations in the use of advance directives. *Oncology Nursing Forum, 25*, 1683–1690.

Hepburn, K., & Reed, R. (1995). Ethical and cultural issues with Native American elders: End of life decision making. *Clinics in Geriatric Med*icine, *11*, 97–112.

Hornung, C. A., Paul, E. G., Strothers, H. S., III, Wieland, D. G., Eng, C., McCann, R., et al. (1998). Ethnicity and decision makers in a group of frail older people. *Journal of the American Geriatric Society*, *46*, 280–286.

Kagawa-Singer, M., & Blackhall, L. (2001). Negotiating cross-cultural issues at the end of life: "You got to go where he lives." *Journal of the American Medical Association*, *28*, 2993–3001.

CULTURAL COMPETENCE AND AGING

The landscape of diversity in the United States is increasing, with one of every four persons identifying as a racial/ethnic minority in 2000. Demographers are now predicting that by 2050, nearly one of every two persons will be of minority descent (Angel & Hogan, 2004). Inherent in the growth rate of minority populations is an increase in the older minority population. In 1999, 16% of America's older population—persons 65 years and older—were minorities, in comparison with approximately 13% of the overall older population (Angel & Hogan, 2004). As a result of differential fertility, mortality, and immigration patterns among minority Americans, the older ethnic minority population will grow even more rapidly in the future. Researchers are projecting one of four older people by 2050 to be of ethnic minority status. Of these, 14 million will be Hispanic, 8.6 million will be Black, and 5.8 million will be persons of other races (Angel & Hogan, 2004). Although diversity has primarily been associated in the United States with ethnicity, diversity has more recently taken on a broader definition to include the sociohistorical and sociocultural experiences of gender and peoples of different social classes, linguistic abilities, religious and spiritual beliefs, sexual orientations, and physical and mental abilities (National Association of Social Workers, 2001).

The increase in the diversity among elders predisposes a societal responsibility to develop and provide opportunities for economic well-being and to deliver health and social services that are uniquely tailored for these populations. This responsibility is amplified when viewed in context of the economic and health disparities and differing health care and social service utilization patterns that exist for older ethnic minority populations, women, the poor, and other at-risk populations (Angel & Hogan, 2004).

To accommodate the changing needs of an increasingly older population that exhibits disparities in all of these areas, it is important to provide opportunities for a good life throughout the life course and design services that respond to diversity. One national agenda as reflected in the *Healthy People 2010* report identifies goals and strategies that seek to highlight the disparities among racial and ethnic minorities and the elderly. Dr. Clay Simpson, Jr., former Deputy Assistant Secretary for Minority Health, states:

> . . . We cannot improve the health of all Americans unless we bring up those who lag behind. . . . closing the gap in illness and death between minorities and other U.S. populations, and improving access to health care. Services must be accessible and acceptable to all Americans, regardless of their racial or ethnic background, language, education level or financial situation . . . Cultural competence is critical (Simpson, 1998).

Scope, Parameters, and Best Practices

In the last 15 years, there has been pronounced attention to the importance of cultural competence in a nation that is increasingly diverse. In addition to the acknowledgment of the heterogeneity of the aged population and the concurrent evidence of economic and health disparities, a compelling justification for a cultural-competence perspective in the human services is the promotion of social justice (Brach & Fraser, 2000). Social justice is the condition in which there is a respect for human dignity, a concern for self-determination, and the assurance that all members of society have the same basic rights and opportunities. Advocating for culturally competent programs and services for older diverse populations is equated with the assurance of equitable access, the promotion of service utilization, and the promise of improved economic health for all Americans.

There are multiple definitions of cultural competence; however, they all capture several common denominators, including (1) knowledge and skills that are compatible with culturally diverse peoples, (2) attitudes and values that honor diversity, and (3) a dual focus on the responsibilities of the provider and institution to improve practice, policy, and research related to the culturally diverse (Mokuau, 1999; National Association of Social Workers, 2001). Implicit in these denominators is the importance of the provider to continually engage in self-reflective activities that assess his or her worldviews and values regarding oppression, discrimination, and working with the culturally diverse. The Office of Minority Health (OMH) in the Bureau of Primary Health Care provides the following definitions of *culture* and *competence*:

> Culture refers to integrated patterns of human behavior that include the language, thoughts, communications, actions, customs, beliefs, values and institutions of racial, ethnic, religious or social groups. Competence implies having the capacity to function effectively as an individual and an organization within the context of the cultural beliefs, behaviors, and needs presented by consumers and their communities (Meadows, 2000).

In addition, the OMH has published standards for cultural and linguistic competence that emphasize culturally competent care (i.e., providers showing respectful care of diverse clients), language-access services (i.e., provide bilingual staff), and organizational supports (i.e., maintain demographic, cultural, and epidemiological profile of the community) (Office of Minority Health, 2001). Additional strategies viewed as examples of cultural competence include the provision of interpreter services, the use of community health workers, the incorporation of culture-specific attitudes and values into health promotion tools, and the inclusion of family members in health care decision making.

Literature related to cultural competence with older minority populations is limited but growing (Whitfield, 2004). In general, this literature reflects a combination of conceptual and empirical research, which emphasizes improving the theoretical understanding of the relationship of ethnicity, gender, social class, and other variables to aging. It also broadly describes ways to reconceptualize health and social services to be more culturally appropriate for diverse elders. Empirical data testing the efficacy of culturally competent methods are also limited, but what is available is generally suggestive that culturally diverse elders and their families benefit in improved health outcomes and quality of care, and that culturally competent approaches can contribute to the elimination of racial and ethnic disparities. Policies that reduce administrative and linguistic barriers to service delivery through culture-specific services and interventions appear to result in increased quality of care, quality of life, and client satisfaction with services (Whitfield, 2004). Because cultural competence is also about expanding choice and opportunity for all with special needs, it also speaks to the need for policies to safeguard the rights of all; hence, the importance of increasing awareness about the implications of social policies on diverse older adults. Thus, a critical component of cultural competence consists of those efforts that advocate for the civil rights of all Americans while "staying the course" in the support of antidiscriminatory legislation.

Cultural Competence and Professional Education

One tenet that is pervasive in the literature on cultural competence is the need for education and training in culturally appropriate services. Education and training that addresses the unique characteristics and issues of the population, and identifies services that are tailored for this group, are important in influencing the existing disparities. Far from a static concept, cultural competence is continually changing as are its potential beneficiaries. Ongoing education and reeducation about diversity remains a key need (National Association of Social Workers, 2001). Building on the strengths that emphasize mobilizing clients' assets (i.e., talents, knowledge, capabilities, and resources) in achieving a better quality of life, the imperative states that cultural values and practices reflecting cultural strengths should be utilized in assessment and intervention.

This imperative acknowledges resiliency in the human condition and indicates that a role for social workers is to assist elders and their families to continue growth even through the challenges and tribulations of crises and change. It further acknowledges that this resiliency, in large part, can come from a source of cultural identity, cultural values, and cultural practices. This kind of cultural information provides those who work with older adults with from which to assess the minority elder's and his or her family's degree of subscription to and identification with cultural values and behaviors, and thereby guide prescriptions for interventions. The potential of cultural competency to reduce disparities among culturally diverse elders can further be realized with such educational projects that dually seek to train workers in cultural competency and to develop and continually revise standards that enhance programs, services, and policies for care for specific populations.

COLETTE V. BROWNE

See also

Communication Issues for Practitioners
Cultural Assessment

Internet Resources:

Achieving Cultural Competence, the Administration on Aging (AOA)
http://www.aoa.gov/

National Association of Social Workers (NASW) Cultural Competence in Social Work Practice
http://www.socialworkers.org

National Center for Cultural Competence
http://www.athealth.com/Practitioner/particles/compellingneed.html

The National Institute on Aging (NIA)
http://www.nia.nih.gov/news/

Office of Minority Health, U.S. Department of Health and Human Services (DHHS)
http://www.omhrc.gov/

REFERENCES

Angel, J., & Hogan, D. (2004). Population aging and diversity in a new era. In K. Whitfield (Ed.), *Closing the gap: Improving the health of minority elders in the new millennium* (1–12). Washington, DC: Gerontological Society of America.

Brach, C., & Fraser, I. (2000). Can cultural competency reduce racial and ethnic health disparities? A review and conceptual model. *Medical Care Research and Review*, *57*, 181–217.

Meadows, M. (2000). Moving towards consensus on cultural competency in health care. *Closing the gap: A newsletter of the Office of Minority Health*, 1–2.

Mokuau, N. (Ed.) (1999). *Responding to Pacific Islanders: Culturally competent perspectives for substance abuse prevention (DHHS Publication No. SMA 98-3195).* Washington, DC: U.S. Government Printing Office.

National Association of Social Workers (2001). *Cultural competence standards*. Washington, DC: NASW.

Office of Minority Health (2001, February/March). Revised CLAS Standards from the Office of Minority Health. *Closing the gap: A newsletter of the Office of Minority Health*, 3.

Simpson, C. E. (1998). Healthy People 2010: What can we do to shape the objectives? *Closing the gap: A newsletter of the Office of Minority Health*, 5.

Whitifield, K. (2004). *Closing the gap: Improving the health of minority elders*. Washington, DC: Gerontological Society of America.

CULTURE CHANGE

Culture change is transformation toward a new culture of aging. Originating in the nursing-home sector, "culture change" refers to an ongoing movement to improve and transform an institutionalized system of care to one that focuses on the individuals and supports and integrates quality of care with quality of life. Directed by the older adult's daily routines, needs, and preferences, whether stated directly or through reflexive responses, culture change returns decision making to the individual; it is person-directed care. This information drives what and how that care is provided. Individualized care, the central theme of the Nursing Home Reform Act of 1987 (NHRA), requires transformation from the traditional hierarchical care model that facilities adopted from hospitals to one where staff are consistently assigned to the same residents; coworkers and supervisors are a stable team. This team is empowered to make decisions that immediately respond to residents' choices and needs.

Through culture change, nursing homes shift from "risk prevention" to "health promotion," building on each elder's strengths, preferences, and daily routines. In this new culture of aging, relationships take precedence over tasks, flexibility over schedules, and team over departmental silos. These are language changes that are more than simply cosmetic: the resident (who pre-NHRA was a "patient") is now a "person"; "household," "community," or "neighborhood" replaces "nursing unit."

A hypothetical example of a nursing home that has undertaken culture change illustrates how residents and their caregivers experience these changes. The nursing home has established a permanent neighborhood team that knows that Mrs. Jones' prefers to awaken around 10:00 a.m. Her regular Certified Nursing Assistant (CNA) assists Mrs. Jones upon arising, slowly because of her painful arthritis, but easily. Breakfast is provided. Well rested, Mrs. Jones engages with others during the day and maintains her window-box garden. Despite her dementia, the day starts and proceeds according to Mrs. Jones's lifelong habits and ends with a long bath that helps her sleep comfortably through the night. Before culture change, two CNAs struggled to get Mrs. Jones moving at 7:00 a.m. to meet the facility breakfast time. Mrs. Jones cried in pain each morning and struggled against those who helped her. In the old culture, Mrs. Jones used more pain medication, an antidepressant, and developed a stage II pressure sore from being in the wheelchair too long. The medications caused constipation; suppositories were used. Mrs. Jones was uncomfortable and sleep-deprived, unable to participate with others in daily activities. She was slowly sinking physically, mentally, and emotionally.

Background

In the 1960s, health care professionals, consumer advocates, and researchers explored caring practices based on individualization and relationships in order to eliminate depersonalization and homelessness in nursing-home residents. These concepts were captured in the NHRA of 1987.

The notion of culture change has galvanized nursing homes over the last decade. In a 1995 meeting organized by the National Citizens' Coalition for Nursing Home Reform, several new approaches were discussed: The Regenerative Community built connections between people; resident-directed care restored control to each resident; individualized care replaced facility routine; and the Eden Alternative brought spontaneity and normalcy to life by creating social and biological diversity in nursing homes. In 1997, an expanded "pioneering" group met in Rochester, New York, where collaborative approaches to nursing-home improvement were beginning in two nursing homes. The Pioneer Network articulated the vision and principles of culture change that continues to guide this movement's evolution. Culture-change knowledge and practice builds incrementally. Some practitioners start by developing a vision and principles and then begin the change process. Others begin by following a "way of inquiry" in which they look for "irritants" and frustrations that are natural starting points for change.

The High Cost of Poor Care

Research shows that there are identifiable and remediable differences between facilities that have stable staff and good resident outcomes and those that do not. Resident, workforce, and business interests coincide when there is high-quality leadership throughout the organization. Human resource policies and systems of care value staff in word and deed, and sufficient resources to properly and respectfully care for residents (Eaton, 2002). Financially, facilities with "consistent nursing and administrative leadership, use of team and group processes, and active quality improvement programs" have lower costs of care (Rantz & Flesner, 2003). Facilities with unstable staff and poor outcomes spend more on turnover costs (Seavey, 2004), workers compensation, and lawsuits (Johnson, Dobalian, Burkhard, Hedgecock, & Harmon, 2004). Turnover of nursing home staff (RNs, LPNs, CNAs) was 49% -71% in 2002 with almost 96,000 unfilled positions (American Health Care Association, 2005).

In 2004, Quality Improvement Organizations (QIOs), a voluntary federal Medicare improvement program, developed a model of culture change called HATCh (Holistic Approach to Transformational Change) to integrate the workplace, the environment, and caregiving practices such that clinical outcomes improve, occupancy rates increase, and the high costs of poor care are reduced (Quality Partners of Rhode Island, 2005). Of the 16,000 nursing homes in the United States, more than 2,000 facilities are currently working with 1 of the 53 QIOs. The QIO program will continue at least through 2008 with the eighth 3-year Scope of Work (SOW), this one targeting specific quality measures (QMs), consumer satisfaction, and workforce stabilization. Some QIOs are utilizing specific culture-change practices building on the person- directed care experience with the RI Quality Partners in 2005.

Outcomes and Evaluation

Anecdotal and written evidence suggests that culture-change practices stabilize staff; decrease turnover, psychoactive medications, weight loss, dehydration, pain, agitation, and aggression; and increase family visits and socialization (Rantz & Flesner, 2003; Sloane, 2004; Stone et al., 2002).

After 9 months, the 2005 Rhode Island (RI) QIO pilot program with 254 nursing homes reported a relative improvement of 10% in turnover rates in the 55 nursing homes that concentrated on workforce issues; this resulted in 196 fewer terminations, for a cost savings of $490,000. The QMs publicly reported by the federal government for pain, high risk pressure ulcers, activities of daily living (ADL) decline, locomotion, and restraints improved in these nursing homes as well, thus demonstrating that addressing the workforce results in improved clinical care. In the person-directed care facilities, QMs for high- and low-risk pressure ulcers, depression, and physical-restraints use improved. Among individual participating in RI QIO nursing homes, falls were reduced by 8.9%, antipsychotic use by 50%, and workers compensation claims declined from 44 to 7 (Quality Partners of Rhode Island, 2005)

Federal and State Support for Culture Change

In 2002, The Center for Medicare and Medicaid Services (CMS) held a satellite broadcast for federal and state surveyors and other stakeholders demonstrating that pioneer practices are what the NHRA requires. A second broadcast based on the 2005 QIO workforce and resident-directed care projects is planned. CMS developed the Artifacts of Culture Change Tool with measures for care, environment, family and leadership, workplace practice, and outcomes.

The first annual St. Louis Accord, a national meeting sponsored by the Quality Partners of Rhode Island and the Pioneer Network in 2005, fostered new coalitions. States sent teams of stakeholders to learn together about culture change and coalition building. By 2006, half the states had developed culture-change coalitions that vary in structure, approaches, practices, and financing. Provider associations and other state stakeholders are partnering to bring culture-change activities to their membership.

Enforcement and Accreditation

State and federal survey processes continue to tolerate and sometimes even endorse institutionalized approaches to care. The CMS enforcement process required by the NHRA surveys quality of care; however, the process is less precise for quality of life except for physical-restraint citations. Additionally, changing some aspects of care through culture change does not guarantee that facilities become providers of good care. If residents have choice in foods but staff are not available or do not assist with eating, poor outcomes ensue.

Private long-term-care accreditation organizations are addressing culture change. The Commission on Accreditation of Rehabilitation Facilities incorporated some culture change practices in its standards. The Joint Commission on Accreditation of Health Care Organizations is exploring how each standard might capture the philosophy of resident centeredness.

SARAH GREENE BURGER
BARBARA FRANK

See also
Nursing Homes

Internet Resources

Center for Medicare and Medicaid Services
http://www.cms.hhs.medicare.gov

The Commonwealth Fund
http://www.cmwf.org

National Citizen's Coalition for Nursing Home Reform
http://www.nccnhr.org

Nursing Home Quality Improvement Feedback Tool (NHIFT)
http://www.qualitynet.org/dcs/ContentServer?cid=1143577178911&pagename=QnetPublic%2FPage%2FQnetTier2&c=Page

Pioneer Network
http://www.pioneernetwork.net

Quality Improvement Organization Association
http://www.ahqi.org

Quality Partners of Rhode Island
http://www.riqualitypartners.org

REFERENCES

American Health Care Association. Act Now For Your Tomorrow: Final Report of the National Commission on Nursing Workforce for Long Term Care, April 2005
http://www.ahca.org/research/workforce_rpt_050519.pdf

Eaton, S. C. (2002). What a difference management makes! Nursing staff turnover variation within a single labor market. In *Appropriateness of minimum nurse staffing ratios in nursing homes* (chap. 5), Phase II Report to Congress, U.S. Department of Health and Human Services

Johnson, C. E., Dobalian, A., Burkhard, J. D., Hedgecock, B. A., & Harmon, J. (2004). Factors predicting lawsuits against nursing homes in Florida 1997–2001, *Gerontologist*, *44*(3), 339–346.

Quality Partners of Rhode Island (2005). Final project report – October, improving nursing home culture pilot study. Centers for Medicare and Medicaid Services.

Rantz, M. J., & Flesner, M. K. (2003). *Person-centered care: A model for nursing homes*. Silver Spring, MD: American Nurses Publishing.

Rantz, M. J., Hicks, L., Grando, V., Petroski, G. F., Madsen, R. W., Mehr, D. R., et al. (2004). Nursing home quality, cost, staffing, and staff mix. *The Gerontologist*, *44*(1), 24–38.

Seavey, D. (2004). The cost of frontline turnover in LTC, Better Jobs Better Care. Available at http://www.bjbc.org

Sloane, P. D., Hoeffer, B., Mitchell, C. M., McKenzie, D. A., Barrick, A. L., Rader, J., et al. (2004). Effect of person-centered showering and the towel bath on bathing-associated aggression, agitation and discomfort in nursing home residents with dementia. *Journal of American Geriatrics Society*, *52*(11), 1795–1804.

Stone, R., Reinhard, S., Bowers, B., Zimmerman, D., Phillips, C., Hawes, C., Fielding, J., and Jacobson, N. 2002. *Evaluation of the Wellspring Model for Improving Nursing Home Quality*. The Commonwealth Fund. http://www.cmwf.org/programs/elders/stone_wellspringevaluation_550.pdf

CURE VERSUS CARE

It appears strange in a postmodern age to be discussing care and cure in adversarial terms. Cure (the usual aim of medical treatment) is usually so dominant that care (the usual aim of nursing) can only be valued and flourish when pitted successfully against cure. Theoretically, people have a right to both the opportunity to strive for cure and to be cared for at the same time (Teno, Fisher, Hamel, Coppola, & Dawson, 2002). Indeed, experienced health care professionals from all disciplines believe that the two are inseparable. There is little doubt, however, that more resources are committed to the delivery of curative modalities of health care than to caring modalities, including physical resources, personnel, and research. Although a large share of the health dollar is spent on treatment for elderly people—cardiac surgery is now predominantly performed on people older than age 70 (Walton, Martin, Peter, Pringle, & Singer, 2006)—caring for people when they insidiously lose independence in their later years is left largely to the persons themselves or their relatives or to untrained caregivers.

Modern medicine has exploited the hopes of all people for diminished mortality. Although epidemiological studies show we have been successful in delaying the moment of death, the record to date on achieving cure is not good. The reality is that there is no cure for old age and death is inevitable eventually. The cost of prolonging life can be high for the person and society in terms of quality of life and the cost of treatments. Many elderly people live with chronic illness and concomitant frailty; most attempts at curing disease result in a compromised state of health for the sufferer. Perhaps treatment should be substituted for the word *cure*—treatment that can be given by medical doctors, physiotherapists, dietitians, social workers, nurses, and so on—for all the symptoms of disease that can plague people as the years mount up. If medicine cannot cure disease, then perhaps a more reasonable expectation is for the elderly to be as comfortable and as able as possible within the boundaries of existing science and limited resources for health care. On the whole, this means that treatment is aimed at controlling and improving physical symptoms within the context of each person's social and psychological situation (Mukaetova-Ladinska, 2006).

Illness haunts elderly people particularly as they reach the 80s and 90s. Old age, for most people, is accompanied by increasingly frequent episodes of illness that can herald frailty, the factor that makes people look and feel old. Older people turn to medicine and expect treatments in order to live to their maximum potential.

Chronically ill elderly people place great store in the medical profession and its powers to treat their illnesses. They refer to medical opinions they have been given and the expertise of different doctors they have encountered, relish the doctor's time and attention, and remember and recount things that doctors had said to them verbatim (FitzGerald & Horton, 2004). In general, chronically ill people acknowledge members of the medical profession as the experts (although this respect can wear thin on occasions with the frustration of unsatisfactory outcomes), and they pin their hopes for improvements, or even cure, upon them. What the chronically ill are most appreciative of, however, is a doctor who shows them humane concern and care in conjunction with medical expertise.

Although it is not quite as clear-cut as presented herein, people of any age generally appreciate two things in health care professionals: professional acumen and humane qualities. They describe acumen as being able to make a correct diagnosis and improve or contain the course of their disease process. They describe humane qualities in terms of being made to "feel better" or "really cared for." This care is manifest in the time given to others, the way they are listened to, and the way to which their particular needs are attended.

Traditionally, nurses have been associated with care rather than cure (Pearson, Vaughan, & FitzGerald, 2003). However, as roles among health care professionals become blurred, doctors cannot rely on nurses or other health professionals to assume the caring side of treatment. Nurses have a range of therapies to offer within their caring paradigm.

This range of therapies is expanding each year as nurses both extend and expand their practice. The nurse practitioner is well positioned to offer elderly people precisely the combination of cure and care that they require.

Nursing has devoted a great deal of time to identifying and testing theories and work that apply nursing therapy with a fundamental care context. For example, Hall's work at the Loeb Centre in New York put into practice her ideas regarding nursing as core, care, and cure (Hall, Rifkin, & Levine, 1969). Pearson, Punton, and Durrant (1992) demonstrated the effectiveness of nursing therapy within a caring model. Elderly people admitted to units had a primary need for nursing therapy. These patients were compared with a control group nursed in a typically cure-oriented system. Results showed that the experimental group had a higher quality of care, higher levels of independence on discharge, slightly longer hospital stay, but lower cost per day. In an ethnographic study, Ersser (1997) explored the therapeutic activity of nursing and concluded that the care elements of nursing were the presentation of the nurse relating to the patient and the tasks and procedures undertaken in the course of nursing.

Neuman's (1995) health care systems model is an example of a theoretical model of nursing that has been developed carefully over 3 decades. This work combines therapy and care in relation to the specific needs of individual human beings. Suitable for all health care professions, it provides a useful framework for finding the elusive balance of cure and care in each encounter or professional relationship with a client. Neuman's emphasis is on prevention, health education, wellness, and the management of ill health.

As the health professions continue to develop their roles as therapists to the elderly, it will be interesting to see whether they adopt a medical model of short consultation and prescription or retain and refine skills of caring and curing people at the same time.

MARY FITZGERALD

See also

Advance Directives
Advanced Practice Nursing
Consumer-Directed Care
Palliative Care
Patient–Provider Relationships

Internet Resource

United Nations: Report of the Second World Assembly on Ageing
http://www.un.org/esa/socdev/ageing/waa/a-conf-197-9a.htm

REFERENCES

Ersser, S. (1997). *Nursing as a therapeutic activity: An ethnography*. Avebury, England: Aldershot Publishing.

FitzGerald, M., & Horton, E. (2004). The experience of chronic illness: A phenomenological approach. In R. Nay & S. Garratt (Eds.), *Nursing older people, issues and innovations* (2nd ed., pp. 209–228). Marrickville, NSW, Australia: Elsevier.

Hall, L.E., Rifkin, E., & Levine, H. (1969). The Loeb Center for Nursing and Rehabilitation, Montefiore Hospital and Medical Center, *International Journal of Nursing Studies*, 6, 81–95.

Mukaetova-Ladinska, E. (2006). Towards living long and being healthy–The challenge for liaison psychiatric services for older adults. *Age and Ageing*, *35*, 102–105.

Neuman, B. (1995). *The Neuman Systems Model* (3rd Ed.). Norwalk, CT: Appleton & Lange.

Pearson, A., Punton, S., & Durrant, I. (1992). *Nursing beds: An evaluation of the effects of therapeutic nursing*, London: Scutari Press.

Pearson, A., Vaughan, B., & FitzGerald, M. (2003). *Models for Nursing Practice*. Edinburgh: Butterworth Heinemann.

Teno, J., Fisher, E., Hamel, M., Coppola, K., & Dawson, M. (2002).Medical care inconsistent with patients' treatment goals: Association with 1-year Medicare resource use and survival. *Journal of American Geriatrics Society*, *50*(3), 496–500.

Walton, N., Martin, K., Peter, E., Pringle, D., & Singer, P. (2006, June). Priority setting and cardiac surgery: A qualitative case study. *Health Policy* (Epub ahead of publication).

D

DAYTIME SLEEPINESS

Excessive daytime sleepiness (EDS), a problem twice as common in the elderly (i.e., older than 75 years) as in middle-aged adults (Bixler et al., 2005), results from of impaired or inadequate sleep. Distinct from fatigue, which is difficulty sustaining a high level of performance, EDS is the inability to maintain alertness, with characteristic hypersomnia. Age-related changes in chronobiology, sleep disorders, other medical and psychological disorders, medications, environmental factors, and altered social patterns can lead to EDS. It is unclear how much of the change in sleep patterns experienced by older adults is due to normal physiological alterations, pathological events, sleep disorders, or poor sleep hygiene. The common misbelief that daytime sleepiness is acceptable in older adults can complicate attempts to isolate the cause of EDS. This perception may prevent elders from seeking medical attention or receiving medical care for daytime sleepiness. However, sleep problems can impair daily functioning and increase caregiver burden, increasing the risk of institutionalization (National Commission of Sleep Disorders Research, 1994).

Causes of EDS

Aging causes changes in sleep architecture and in the circadian pattern of alertness and sleepiness. Although older adults frequently spend more time in bed, the quality and efficiency (i.e., percentage of time asleep) of their sleep decreases. Older adults, especially older men, experience an increased proportion of time in light sleep (stages 1 and 2) and a marked decrease in deep or slow-wave sleep (stages 3 and 4). Older adults have more problems falling asleep (increased sleep latency), more frequent awakenings (increased sleep fragmentation), and reduced ability to return to sleep once awakened (poor sleep maintenance). Circadian rhythms become altered. Typically, there is less variability (amplitude) with a shift toward becoming sleepy earlier in the evening (phase advance) followed by early awakening and daytime napping, which reduce sleep consolidation. These normal changes are not necessarily accompanied by complaints of EDS in healthy older adults.

EDS can also result from medications and other conditions. Many medications such as benzodiazepines, barbiturates, some antiepileptic medications, H1 antihistamines, beta-blockers, and dopaminergic agonists (i.e., anti-Parkinson drugs) have sedating side effects. Pain medications, alcohol, and sleeping medications (prescription or over-the counter [OTC]) are also associated with EDS. Congestive heart failure, asthma, and gastroesophageal reflux also disrupt sleep, as do symptoms such as chronic pain, depression, obesity, and nocturia (Roehrs, Carskadon, Dement, & Roth et al., 2005). In addition, it is estimated that 57% of persons 60 years and older have a primary sleep disturbance that increases daytime sleepiness (i.e., 24% have sleep apnea, 45% have periodic leg movements, and 29% have insomnia) (Kryger, Monjan, Bliwise, & Ancoli-Israel et al., 2004). Over and above the impact of illnesses and medications, nursing-home and hospital settings are also know to impair circadian rhythms and sleep quality because of noise, lack of external time cues (i.e., zeitgebers), care routines or roommates, social isolation, reduced daytime light exposure, and excessive nighttime light exposure.

Consequences of EDS

In older adults, EDS is associated an increased risk for cardiovascular mortality, hypertension, and stroke. EDS has been shown to have neurobehavioral consequences, such as decreased reaction time and reduced attention span. Motor-vehicle accidents occur when people with EDS fall asleep at the wheel or fail to drive defensively. Sleepy older adults experience decrements in social outcomes, general productivity, vigilance, activity level, and global assessment of functional status when compared to nonsleepy older adults (Gooneratne et al., 2003). Furthermore, daytime sleepiness impairs working memory, cognitive processing, affect, and mood. Many of these symptoms are similar to those found in depression, delirium, and dementia. Thus, when evaluating these conditions, sleep-related causes should rank high in the differential diagnosis.

Assessment of EDS

A comprehensive sleep history and a sleep diary should be used to assess EDS. One tool for quantifying EDS is The Epworth Sleepiness Scale (Johns, 1991), which is a brief, valid, reliable measure that asks how likely an individual would fall asleep during usual daily activities (e.g., watching television, riding in a car, or listening to a lecture). The Pittsburgh Sleep Quality Scale (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) is also useful to assess global sleep quality and insomnia. In addition, the clinician should ask about risk factors for obstructive sleep apnea (OSA) such as snoring, periods of not breathing (apnea) during sleep, and upper-body obesity. Restless-leg symptoms alone can be treated by a primary care provider, and the initial treatment of insomnia should focus on sleep-hygiene education. Any suspicion of OSA should generate a referral to a sleep specialist. Assessment of OSA and pronounced EDS may require an overnight sleep study (polysomnography) and may also require a daytime test of sleepiness (i.e., Multiple Sleep Latency Test).

Sleep Hygiene

Overall, the most important aspect of assessing EDS includes the patient's sleep-hygiene habits. Although the average person has a good understanding of what constitutes dental hygiene (e.g., brushing and flossing), most people do not understand what constitutes good sleep hygiene. Sleep hygiene includes a wide range of strategies, conditions, and routine behaviors that promote both good sleep and an adequate quantity of sleep—based on what is normal for a given individual. The following short list of good practices provides the foundation for achieving good sleep irrespective of health status or age.

Do not go to bed unless sleepy

The bed should be used only for sleeping (or intimacy or sex). If not sleepy, the person should do something that is relaxing but not stimulating.

Develop consistent and rest-promoting bedtime routine

This includes going to bed at the same time each evening. A warm bath, a light snack, or a few minutes of reading can help the person relax before bed. The bedroom should be a dark, quiet, and slightly cool environment. Do not read, eat, watch TV, talk on the telephone, or play cards in bed.

Get up at the same time every morning

Upon awakening, patients should get out of bed, no matter what time it is. If they awake during the night, they should avoid looking at the clock; frequent time checks heighten anxiety and make sleep onset more difficult.

Avoid naps

Patients should also avoid frequent naps during the day longer than 30 minutes' duration. Never take a nap after 3 p.m.

Avoid things that disturb sleep

Strenuous exercise should be avoided 6 hours before bedtime; it is best to time it early in the day.

Caffeine should be avoided after lunch. Cigarettes and alcoholic beverages should be avoided before bedtime. Large meals and excitement should be limited before bedtime. Bedtime is a time to rest, not to worry.

Avoid sleeping pills, or use them cautiously

Most doctors do not prescribe sleeping medications for longer than 2 weeks. Don't take OTC sleeping pills. Do not drink any alcohol if taking sleeping pills.

Summary

Sleep is a basic biological need that is essential to our health, performance, safety, and quality of life. EDS is not benign in older adults and has serious negative consequences. Signs and symptoms of sleep difficulties need to be evaluated by a knowledgeable health care provider. Establishing healthy sleep-hygiene practices prevents sleep problems and promotes optimal sleep across the age span.

MARY GRACE UMLAUF
EILEEN R. CHASENS
TERRI E. WEAVER

See also
Sleep Disorders

Internet Resources
American Academy of Sleep Medicine
http://www.aasmnet.org

National Center on Sleep Disorders Research
http://www.nhlbi.nih.gov/health/public/sleep/index.htm (for the general public)
http://www.nhlbi.nih.gov/health/prof/sleep/index.htm (for health care professionals)

National Sleep Foundation
http://www.sleepfoundation.org/

New Abstracts and Papers in Sleep (NAPS)
http://www.websciences.org/bibliosleep/NAPS/

REFERENCES

Bixler, E. O., Vgontzas, A. N., Lin, H. M., Calhoun, S. L., Vela-Bueno, A., & Kales, A. (2005). Excessive daytime sleepiness in a general population sample: The role of sleep apnea, age, obesity, diabetes, and depression. *Journal of Clinical Endocrinology & Metabolism 90*(8), 4510–4515.

Buysse, D. J., Reynolds, C. F., III, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*, *28*(2), 193–213.

Gooneratne, N. S., Weaver, T. E., Cater, J. R., Pack, F. M., Arner, H. M., Greenberg, A. S., et al. (2003). Functional outcomes of excessive daytime sleepiness in older adults. *Journal of the American Geriatrics Society*, *51*(5), 642–649.

Johns, M. W. (1991). A new method for measuring daytime sleepiness: The Epworth sleepiness scale. *Sleep*, *14*(6), 540–545.

Kryger, M., Monjan, A., Bliwise, D., & Ancoli-Israel, S. (2004). Sleep, health, and aging. Bridging the gap between science and clinical practice. *Geriatrics*, *59*(1), 24–30.

National Commission of Sleep Disorders Research (1994). Wake up America. *A National Sleep Alert*, *2*.

Roehrs, T., Carskadon, M. A., Dement, W. C., & Roth, T. (2005). Daytime sleepiness and alertness. In M. H. Kryger, T. Roth, & W. C. Dement (Eds.) *Principles and Practice of Sleep Medicine* (4th ed., pp. 39–50). Philadelphia: W. B. Saunders.

DEATH ANXIETY

Philosophers in the modern era have almost unanimously assumed that the human encounter with death is marked by angst, dread, uncertainty, and fear—in a word, anxiety. At the same time, advances in life-extending technology, diet, and general lifestyle (at least in industrialized countries) have improved the longevity of most people, effectively associating death with old age in the popular imagination. As a result of these two converging trends, one might assume that the elderly, who are statistically "closest" to death, would experience considerable death anxiety. However, the general trend across studies points to a decrease in death anxiety with advancing age. This does not mean that all older people have uniformly low levels of death anxiety, but rather that, as a group, they have lower levels of death anxiety than middle-aged people. In later adulthood, death anxiety tends to stabilize and does not appear to continue decreasing with age. Well-designed surveys have demonstrated that age is a relatively good predictor of fear of death, accounting for more of the variation than other important demographic and social variables such as education, income, and ethnicity. Future researchers need to pay closer attention to factors specific to older adults, such as perceived nearness of death, quality of life, subjective passing of time, and achievement of the developmental tasks of late adulthood, to gain a clearer picture of the psychological transitions in late life that may affect attitudes toward death (Tomer, 2000).

Research has shown that the gender difference in death anxiety evident in younger adults—with women reporting more fear than men—is not present in older adults. This finding is consistent with research showing that older adults are less differentiated by gender and exhibit a more androgynous gender identity. Ethnicity has been associated with greater death awareness, with African Americans and Hispanics reporting greater familiarity with death and greater exposure to violence than Whites. However, studies have been mixed regarding whether these ethnic differences are associated with greater *anxiety* about death among various subgroups. Recently, cross-cultural research has begun to identify distinctive features of death anxiety for different cultural groups, such as the preoccupation with "the torture of the grave" among Moslem adults who fear divine punishment visited upon their still sentient bodies after burial, or the concerns of traditional Chinese about their loved ones returning as "hungry ghosts" if not given appropriate ritual support in the afterlife. Such findings argue for greater attention to cultural meanings of death so that professional caregivers can be sensitive to the unique concerns of older adults and their family members as death approaches.

Because deteriorating health and diminished income necessitate changes in residence for many elderly people, researchers have studied whether living arrangements (e.g., in the community versus in an institution) have an impact on death attitudes. Some evidence suggests that nursing-home residents report greater death fears than those who live more independently, but this may be confounded with the association between death anxiety on the one hand and poor health and diminished life satisfaction on the other. Nonetheless, the findings that the institutionalized elderly are more likely to encounter death, think of it often, have less control over their life, and suffer deterioration in the quality of life make further study of the death concerns of this vulnerable group a priority in future research. Too little research has attended to the impact of specific institutional arrangements, such as residential hospice programs, that might be expected to ameliorate the death anxieties of both patients and families in the end-of-life period by promoting appropriate pain control, facilitation of family communication, and self-determined life closure in a supportive setting.

Many studies in this area correlate death anxiety with another single variable, such as physical health, psychological status, and religiosity. A systematic review of this literature indicates that greater physical and emotional problems predict higher levels of death anxiety in older adults, although more work is needed to clarify the specific medical and psychological characteristics responsible for these general trends (Fortner & Neimeyer, 1999). In younger cohorts, people who are more religious generally report lower levels of death anxiety. This relationship is less evident in older adults, although some studies suggest that religious orthodoxy and belief are associated with greater death acceptance, whereas simple church attendance and involvement in religious activities are unrelated to death attitudes (Neimeyer, Wittkowski, & Moser, 2004).

Perhaps a more enlightened approach would be to focus on individual personality traits, coping styles, and competencies and how they interact with environmental conditions to accentuate or ameliorate fears about death and dying (DePaola, Neimeyer, Griffin, & Young, 2003). For example, ego integrity or life satisfaction of elderly respondents has been found to interact with their place of residence: Institutionalized elderly with low ego integrity are especially vulnerable to heightened concerns about their mortality. Other work has concentrated on the particular coping skills used by older persons (e.g., prayer, reminiscence) to deal with specific aspects of death anxiety (e.g., helplessness, questions about the afterlife, the pain of dying). Sophisticated studies that examine discrete death fears as a function of styles of coping with developmental transitions would contribute to our information on the subject.

In caregiving contexts, drawing on both personal resources (e.g., hope, optimism, and resilience) and spiritual beliefs (e.g., an overall sense of life purpose and closeness to God or a higher power) could help alleviate concerns about death and dying by seeking ways to approach the end of life that are compatible with the person's basic life philosophy. Actively facilitating discussion of critical decisions about health care before crises occur can also allay anxieties about medical treatment at the end of life, particularly if these discussions are shared by proxy decision makers within the family. Likewise, joining older adults in writing or recording the important stories or lessons of their life to leave as a legacy for others can permit the ending of life to be seen as a completion rather than interruption of their life story (Gross, 2006).

Unfortunately, our understanding of the nature and predictors of heightened death fear among older individuals has been hampered by several factors, both theoretical and methodological. Theoretically, researchers have concentrated on easily measured demographic characteristics and measures of physical and mental illness rather than on the potential resources of older adults (e.g., coping, family support), which could yield a more optimistic view of their ability to face death with equanimity, acceptance, or even affirmation. Methodologically, investigators have relied too heavily on unvalidated, idiosyncratic death-anxiety scales that treat death attitudes as a single, unidimensional trait rather than a complex construct with many aspects (e.g., fear of pain associated with dying, anxiety about loss of control, apprehension about punishment in the afterlife, viewing death as a natural part of life, motivation for hastened death in the context of life-threatening illness). However, valid and reliable multidimensional measures of death anxiety and acceptance are now available and are beginning to add clarity and richness to studies (Neimeyer, Moser, & Wittkowski, 2003). Likewise, investigators have recently begun to ground their studies in more comprehensive psychological, sociological, and developmental theories, which could give coherence and direction to future research. As we continue to clarify the environmental and personal determinants of death anxiety, we will be in a better position to design educational, counseling, clinical, and policy interventions to promote a more humane encounter with death and loss at all points in the life span.

Robert A. Neimeyer

See also

Anxiety and Panic Disorders
Coping With Chronic Illness
Cultural Assessment
Cultural Competence and Aging
Spirituality
Suicide

Internet Resources

End of Life/Palliative Education Resource Center (EPERC)
http://www.eperc.mcw.edu

Growthhouse
http://www.growthhouse.org/

Hospice Society of America
http://www.hospice-america.org/about.html

REFERENCES

DePaola, S. J., Neimeyer, R. A., Griffin, M., & Young, J. (2003). Death anxiety and attitudes toward the elderly among older adults: The role of gender and ethnicity. *Death Studies*, *27*, 335–354.

Fortner, B. V., & Neimeyer, R. A. (1999). Death anxiety in older adults: A quantitative review. *Death Studies*, *23*, 387–411.

Gross, J. (2006, May 20). For the families of the dying, coaching as the hours wane. *New York Times*, p. 1.
Neimeyer, R. A., Wittkowski, J., & Moser, R. (2004). Psychological research on death attitudes: An overview and evaluation. *Death Studies*, *28*, 309–340.
Neimeyer, R. A., Moser, R., & Wittkowski, J. (2003). Assessing attitudes toward death: Psychometric considerations. *Omega*, *47*, 45–76.
Tomer, A. (Ed.) (2000). *Death attitudes and the older adult* Philadelphia: Brunner-Routledge.

DECONDITIONING PREVENTION

Physical deconditioning in the elderly is a common physiological phenomenon and can severely limit an individual's ability to perform activities of daily living (ADL). General deconditioning typically results from prolonged illness, bedrest, or sedentary lifestyle and is commonly associated with decreased aerobic capacity, muscle atrophy, weakness, and loss of coordination and balance. The association between deconditioning and coordination and balance deficits is of particular concern, as falls are a serious threat to the independence and health of the elderly population.

Some of the physiological changes associated with deconditioning include the following:

- decreased work capacity resulting from decreased oxygen uptake and cardiac output
- decreased circulating blood volume, which can result in tachycardia, orthostatic hypotension, dizziness, and syncope
- decreased plasma and circulating red blood cells, which can decrease the oxygen-carrying capacity of blood
- decreased lean body mass related to decreased muscle size and strength
- increased prevalence of osteoporosis and an increased likelihood of fractures upon falling

One of the primary objectives of an exercise intervention is to improve physiological and functional indices to promote independence and quality of life. Through regular exercise and conditioning, the negative aspects of cardiovascular and neuromuscular deconditioning can be reversed and functional status increased. Improvements in cardiovascular, metabolic, endocrine, and psychological health following exercise in the elderly are well documented (Nied & Franklin, 2002). In addition, various exercise programs have been shown to increase balance and ambulatory status, reduce the incidence of falls, and decrease mortality and morbidity in older adults (Blair et al., 1989; Campbell et al., 1997). In general, a variety of exercise approaches has been advocated, including muscle strengthening, cardiovascular endurance, and balance training.

Exercise Prescription for the Elderly

When developing an exercise program, four basic factors should be considered: (1) mode or type of exercise, (2) frequency of participation, (3) duration of each exercise period, and (4) intensity of the exercise bout. Adequate warm-up and cool-down periods, as well as appropriate stretching, should be incorporated in the exercise regimen. Before beginning any exercise program, individuals should be screened and cleared by their physicians for cardiac risk factors, musculoskeletal limitations, and starting exercise levels. The American College of Sports Medicine recommends exercise stress-testing for all sedentary or minimally active older adults who plan to begin an exercise program. Ideally, an exercise program should incorporate three basic components: strength training, aerobic exercise, and balance and flexibility.

Strength training

Decreased muscular strength has been implicated as a risk factor for falls and is a common cause of mobility problems in the elderly. Increased strength has been associated with improved gait parameters in the elderly (Judge, Smyers, & Wolfson, 1992), whereas resistance training has been shown to prevent age-related sarcopenia (Borst, 2004) and osteoporosis (Liu-Ambrose, Khan, Eng, Heinonen, & McKay, 2004).

To improve ambulatory status, balance, and posture, strengthening exercises should address the major muscle groups of both the upper and lower extremity. Resistance can be accomplished through a variety of methods, including rubber tubing, latex bands, dumbbells, ankle or wrist weights, and specialized machines. Participants should begin by performing 10 repetitions of each exercise (i.e., 1 exercise per muscle group). The magnitude of resistance should be such that fatigue occurs following the last repetition. A common method for determining the appropriate resistance is 70% of an individual's 1-repetition maximum. Exercises should be progressive over time, such that 3 sets of 10 repetitions can be performed. Each set should be followed by a 30-second rest period, with a 1- to 2-minute rest period between exercises.

It is generally recommended that at least two strengthening sessions per week (preferably three) be performed. Exercises should be conducted slowly and with supervision to ensure proper technique and safety. Home programs should be encouraged once the exercises have been mastered.

Cardiovascular/aerobic training

Endurance training in the elderly has been associated with increases in walking ability and balance indices as well as age-related declines in aerobic capacity (Buchner, Cress, de Lateur, Esselman, Margherita, 1997). The most common types of cardiovascular exercise are walking programs, exercise machinery (e.g., stationary bicycles), and specialized aerobic-movement classes. A typical endurance session lasts 1 hour and should consist of a 15-minute warm-up, a 35- to 40-minute exercise session, and a 5- to 10-minute cool-down period.

In accordance with the guidelines of the American College of Sports Medicine, the training intensity should be between 60% and 75% of the age-adjusted maximum heart rate (calculated by subtracting the participant's age from 220). The target heart rate should be gradually increased from 50% to 75% of the maximum heart rate over the course of 3 months. Heart rate should be monitored during and after exercise to ensure the proper training intensity.

Balance training

Specific balance exercises have been shown to increase mobility and postural stability in the elderly. The goal of such exercises is to improve vestibular function and proprioception. Both active and static exercises have been proposed in the literature. Active exercises include tasks such as a tandem heel-toe gait and walking along a straight line; static balance exercises include standing on one leg and maintaining various postures. The level of difficulty of static exercises can be increased by having individuals perform them with their eyes closed or while standing on a foam block. In addition, tasks that employ a narrow base of support or weight shifting are appropriate.

Tai chi has been studied in several randomized, controlled trials and has been shown to be effective in improving postural sway and in delaying the onset of falls in the elderly (Wolf, Barnhart, Ellison, & Coogler, 1997). Tai chi exercises involve full body movements that facilitate muscular control of movement, flexibility, and improved "body awareness." Interventions of approximately 4 months' duration have been effective in improving balance and mobility indices.

Although different forms of exercise have been shown to improve functional status in the elderly, the optimal exercise regimen for improving physical fitness and balance in the elderly has yet to be defined. Exercise programs should be individualized based on muscle strength, cardiovascular function, and balance and gait parameters. Emphasis should be placed on the most significant deficits and the goals of the participant. A multidimensional exercise program should be implemented to prevent the deleterious effects of deconditioning.

CHRISTOPHER M. POWERS

See also

Balance
Exercise and the Cardiovascular Response
Falls Prevention
Iatrogenesis

Internet Resources

American College of Sports Medicine
http://www.acsm.org

American Council on Exercise
http://www.acefitness.org

American Heart Association
http://www.americanheart.org

50-Plus Fitness Association
http://www.50plus.org

REFERENCES

Blair, S. N., Kohl, H. W., Paffenbarger, R. S., Clark, D. G., Cooper, K. H., & Gibbon, L.W. (1989). Physical fitness and all-cause mortality: A prospective study of healthy men and women. *Journal of the American Medical Association*, *262*, 2395–2401.

Borst, S. E. (2004). Interventions for sarcopenia and muscle weakness in older people. *Age and Ageing*, *33*, 48–55.

Buchner, D. M., Cress, M. E., de Lateur, B. J., Esselman, P. C., & Margherita, A. J. (1997). A comparison of the effects of three types of endurance training on balance and other fall risk factors in older adults. *Aging and Clinical Experimental Research*, *9*,112–119.

Campbell, A. J., Robertson, M. C., Gardner, M. M., Norton, R. N., Tilyard, M. W., & Buchner, D. M. (1997). Randomised controlled trial of a general practice programme of home based exercise to prevent falls in elderly women. *British Medical Journal*, *315*, 1065–1069.

Judge, J. O., Smyers, D., & Wolfson, L. (1992). Muscle strength predicts gait measures in older adults. *Journal of the American Geriatrics Society*, *40*, 20–27.

Liu-Ambrose, T. Y., Khan, K. M., Eng, J. J., Heinonen, A., & McKay, H. A. (2004). Both resistance and agility training increase cortical bone density in 75- to 85-year-old women with low bone mass: A 6-month randomized controlled trial. *Journal of Clinical Densitometry*, *7*, 390–398.

Nied, R. J., & Franklin, B. (2002). Promoting and prescribing exercise for the elderly. *American Family Physician*, *65*, 419–426.

Wolf, S. L., Barnhart, H. X., Ellison, G. L., & Coogler, C. E. (1997). The effect of Tai Chi Quan and computerized balance training on postural stability in older subjects. *Physical Therapy*, 77, 104–107.

DEHYDRATION

Definitions

Acute or chronic dehydration is a decrease in total body water and is the most common fluid and electrolyte imbalance in older adults (Hodgkinson, Evans, & Wood, 2003). Dehydration can be categorized as isotonic, hypertonic, or hypotonic, based on the quantity of sodium loss in relation to water loss. Isotonic dehydration occurs with a loss of extracellular fluid without any change in intracellular fluid; sodium and water are lost in equal amounts (Hodgkinson et al., 2003). Hypertonic dehydration is characterized by greater water loss than sodium loss, with high serum sodium levels and high serum osmolarity, and is a result of excessive water loss or inadequate water intake (Hodgkinson et al., 2003). Hypotonic dehydration occurs when more sodium than water is lost (Hodgkinson et al., 2003) with low serum sodium levels and low serum osmolarity. Extracellular fluid is the lowest with hypotonic dehydration.

Volume depletion is a "net loss of total-body sodium with a reduction in intravascular volume" (J. Mentes, 2006, p. 42) and is different than dehydration. Volume depletion is primarily caused by blood loss, diarrhea and vomiting (J. Mentes, 2006). The focus of this chapter is on dehydration, not volume depletion.

Influence of Aging on Dehydration

Older people have increased sensitivity to dehydration due to normal physiological changes in aging. In normal aging, fat is increased and lean body mass is decreased corresponding to a decreased total body water in the elderly (Sheehy, Perry, & Cromwell, 1999). The thirst threshold is increased in aging so there is a decreased perception of thirst (Sheehy et al., 1999). Other age-related changes include the kidneys' reduced ability to conserve water and concentrate urine (Sheehy et al., 1999), decreased sensitivity to antidiuretic hormone (Hodgkinson et al., 2003), and impaired renal conservation of water (Mentes, 2000).

Risk Factors

The risk factors for dehydration can be remembered with the mnemonic FLAME which stands for *F*aulty fluid intake, *L*imited physical function, *A*dvanced age, *M*edications, and *E*nvironment. A decreased fluid intake, or a fluid intake that is not augmented in the presence of fluid loss is a primary risk factor (Ferry, 2005). The decreased fluid intake can be self-imposed to avoid incontinence. Limited physical functioning due to decreased functional ability, use of physical restraints, immobility, diminished vision, or cognitive impairment (Mentes, 2006a), can result in limited access to fluids (Ferry, 2005) or failure to recognize the need for fluid intake. Whereas the elderly are at risk for dehydration, the oldest old (i.e., 85 years of age and older) are at greatest risk (Mentes, 2006a). Polypharmacy is common in the elderly and certain medications actually increase the need for fluid, especially diuretics, laxatives, angiotensin-converting enzyme inhibitors, and psychotropic medications that have anticholinergic effects (Mentes, 2006a). Internal and external environmental conditions can also lead to dehydration. Infection, frailty, diabetes, cancer, cardiac disease, and renal disease can trigger dehydration through varied mechanisms. The external environmental temperature must also be considered because the normal fluid requirement of 1.5 liters/day is increased when outside temperatures are increased or when inside temperatures are overheated (Ferry, 2005).

Diagnosis

The diagnosis of impending or actual dehydration is based on both serum biochemical indicators and clinical signs. Abnormal biochemical parameters for impending dehydration include a blood urea nitrogen-creatinine ratio of 20:1–24:1 mg/dL, a serum osmolality of 290–300 mmol/kg; a urine specific gravity of 1.020–1.029. In addition, the urine is dark yellow in color with a volume of 800–1,200 mL/day. Biochemical indicators for dehydration include a blood urea nitrogen-creatinine ratio greater than or equal to 25.1 mg/dL; serum osmolality greater than 300 mmol/kg; serum sodium greater than 150 mEq/L, urine osmolality greater than 1,050 mmol/kg; and urine specific gravity greater than 1.029. The color of the urine is greenish brown with a total amount of less than 800mL/day (Mentes, 2006a). Clinical signs of dehydration include altered thirst, neuropsychic conditions (e.g.,confusion), arterial ischemia, mucosal dryness, fever, cardiovascular signs (e.g., arterial and orthostatic hypotension and tachycardia); weight loss, sunken eyes, concentrated urine, and lasting skinfolds (Ferry, 2005).

Best Practices

Recognition of Dehydration

Recognition of dehydration is the first step to ensure adequate fluid maintenance in the older adult (American Medical Directors Association., 2001). Initial assessment should be individualized but should focus on basic physiological measures such as vital signs, weight, height, body mass index, and a review of systems. Biochemical measures (discussed previously) should be assessed for abnormalities. Other assessment parameters should include 24-hour fluid intake and urine output, determination of treatments that may preclude a person to develop dehydration such as nothing-by-mouth status and tube feedings, usual pattern of fluid intake and fluid preferences, and intake behaviors or problematic behaviors associated with fluid intake. Cognitive status, functional health status, mood status, medical history, and review of current medications should also be assessed.

The Dehydration Risk Appraisal Checklist (Mentes, 2006a) is an assessment tool used to evaluate dehydration risk in nursing-home residents and focuses on personal characteristics, significant health conditions, medications, intake, and laboratory abnormalities. Continued refinement and validation of the tool is underway.

Interventions

Normal fluid intake in an older person is approximately 1,500 mL, assuming no cardiovascular, renal, or mental disorders that limit or alter fluid intake. A more precise formula for calculating a normal fluid goal is as follows:

100 ml/kg first 10 kg of weight
50 ml/kg for next 10 kg or weight
15 ml/kg for remaining weight (Mentes, 2006a)

If dehydration is documented, then approximately half of the fluid deficit is replaced within the first 24 hours and the remaining deficit is replaced within the next 48 to 72 hours, depending on the patient's clinical condition and co-morbidities (American Medical Directors Association, 2001). The oral route should be used initially unless oral administration of fluids is contraindicated or if the patient is unstable. In an unstable patient, intravenous rehydration is preferred. Hypodermoclysis may be considered if the intravenous route is difficult to obtain or not desired. Rehydration via a nasogastric or gastrostomy tube should be the last choice when selecting a route of administration (American Medical Directors Association, 2001).

Suggestions for enhancing fluid intake include providing liquids and foods high in water content throughout the day; considering an individual's previous intake pattern and individual preferences; educating the patient, staff, and informal caregivers regarding the need for water intake; assessing the patient's individual water intake goal; and recommending fluids and foods that are high in water content.

Whereas recent research has demonstrated that hydration problems in frail, older nursing-home residents can be categorized as can drink, can't drink, won't drink, and end of life (Mentes, 2006b), the associated interventions for each category need further validation for the elderly in the hospital or community setting. However, the interventions do provide a logical approach to treating actual or impending dehydration in those elderly who can receive oral repletion. Whenever possible, preferred beverages should be offered. If the older adult can drink and is independent, interventions should focus on education on the importance of the amount of liquid to be ingested and provision of tools to measure intake. If the older adult can drink but forgets to drink, then interventions should focus on ways to increase fluid exposure. If the older adult can't drink due to either dysphagia or physical dependency, then interventions are focused on enabling fluid intake, as appropriate, with the use of assistive devices, swallowing exercises, or altering the texture of the fluid. If the older adult won't drink and is a sipper, then small amounts of preferred fluid are offered with contact and activities. On the other hand, if the older adult won't drink because he or she fears incontinence, then interventions focus on education on the importance of maintaining fluid intake, Kegel exercises, urge inhibition, and lastly, medication (Mentes, 2006b). If hydration is an issue at the end of life, then interventions should focus on resident and family preference in accordance with advance directives.

Special Considerations for Tube-Fed Patients

Dehydration is a common metabolic problem in tube-fed patients, including the elderly. Risk factors contributing to dehydration in tube-fed patients include use of concentrated enteral formula (1.5 kcal/ml or greater); decrease in fluid intake by mouth; uncontrolled hyperglycemia; formula with a high renal solute load; fever; increase in activity level, particularly in warm weather; diarrhea; failure to receive the volume of formula prescribed; and insufficient free-water flushes (Worthington & Reyen, 2004). If free water is not given in addition to the enteral feeding formula, the older adult is at increased risk for dehydration. To prevent dehydration in a tube-fed older patient, additional free water should be administered throughout the day when flushing the tube or giving medications. A dietitian should be consulted to calculate the precise amount of additional free water required.

Rose Ann Dimaria-Ghalili

See also

Delirium
Eating and Feeding Behaviors
Feeding: Non-Oral
Gastrointestinal Diseases
Gastrointestinal Physiology

Internet Resources

Altered nutritional status (2001)
http://www.guideline.gov/summary/summary.aspx?doc_id=3304&nbr=2530&string=nutrition

American Dietetic Association
http://www.eatright.org/Public/

American Medical Directors Association
http://www.amda.com/clinical/nutrition/

Medicare (Nutrition Care Alerts)
http://www.medicare.gov/Nursing/Campaigns/NutriCareAlerts.asp

National Guideline Clearinghouse
http://www.guideline.gov/summary/summary.aspx?doc_id=3305&nbr+2531&string=dehyration

National Policy & Resource Center on Nutrition and Aging: Fluid Intake and Hydration
http://www.fiu.edu/∼nutreldr/SubjectList/F/Fluid_Intake_Hydration.htm

Nurse Competence in Aging: Hydration Management
http://www.geronurseonline.org

Nutrition Assessment: Adults (2002)
http://www.guideline.gov/summary/summary.aspx?doc_id=3625&nbr=2851&string=nutrition

Nutrition.Gov
http://www.nutrition.gov/home/index.php3

REFERENCES

American Medical Directors Association (2001). Dehydration and fluid maintenance. Columbia, MD: American Medical Directors Association.

Ferry, M. (2005). Strategies for ensuring good hydration in the elderly. *Nutrition Reviews*, *63*, S22–S29.

Hodgkinson, B., Evans, D., & Wood, J. (2003). Maintaining oral hydration in older adults: A systematic review. *International Journal of Nursing Practice*, *9*(3), S19–S28.

Mentes, J. C. (2000). Hydration management protocol. *Journal of Gerontological Nursing*, *26*(10), 6–15.

Mentes, J. C. (2006a). Oral hydration in older adults: Greater awareness is needed in preventing, recognizing, and treating dehydration. *American Journal of Nursing*, *106*(6), 40–49; quiz 50.

Mentes, J. C. (2006b). A typology of oral hydration problems exhibited by frail nursing home residents. *Journal of Gerontological Nursing*, *32*(1), 13–19; quizzes 20–11.

Sheehy, C. M., Perry, P. A., & Cromwell, S. L. (1999). Dehydration: Biological considerations, age-related changes, and risk factors in older adults. *Biological Research for Nursing*, *1*(1), 30–37.

Worthington, P., & Reyen, L. (2004). Initiating and managing enteral nutrition. In P. Worthington (Ed.), *Practical aspects of nutritional support: An advanced practice guide* (pp. 311–341). Philadelphia: Saunders.

DELIRIUM

Delirium is a disturbance of consciousness with reduced ability to focus, sustain, or shift attention; a change in cognition; or the development of a perceptual disturbance that occurs over a short period of time and tends to fluctuate over the course of the day. It is a prevalent disorder that independently contributes to poor outcomes of acute care and may be an indicator of poorer quality of care, and it frequently goes unrecognized or misattributed to dementia. Moreover, agitated behaviors associated with delirium can lead to the use of physical and chemical restraints, further compounding the risk of functional loss and serious complications.

Delirium is a common health problem of hospitalized elderly patients with a varied presentation and time course. The prevalence in hospitalized patients ranges from 10% to 80%; greater rates of prevalence are associated with greater physiologic instability and severity of illness, older age, general surgery, and stays in the Intensive Care Unit (ICU). Left unrecognized and untreated, most patients are discharged while still exhibiting symptoms of delirium. Discouragingly, many of the individuals in whom the delirium resolves suffer future recurrences and are more likely to become demented. Delirium has also been found to be associated with premature death at 1 year and long-term functional decline (Leslie et al., 2005).

Several recent studies have analyzed the costs attributed to delirium and have shown that costs are higher for delirious patients as compared to their nondelirious counterparts in the ICU, general hospital units, and nursing home (Leslie et al., 2005). Costs are also higher for persons with dementia who develop delirium. Fick and colleagues estimated (based on 1999 U.S. vital health statistics) that if we could decrease the length of stay in patients with delirium superimposed on dementia (DSD) (which complicates at least 24% of hospitalizations for persons with dementia and involves more than 13,082 persons and more than 65,885 inpatient days per year) by just 1 day (at $1,609 Medicare cost per hospital day), we would save at least $21 million per year in persons with dementia. In another recent study, total costs for patients with delirium and DSD were almost two times higher than comparison patients matched on age, sex, and co-morbidity during a 3-year period (Fick, Kolanowski, Waller, & Inouye, 2005).

Given these facts, the prevention, prompt and early diagnosis, and effective management of delirium are critical; thus, the following topics are discussed relative to the care of the elderly. Assessment is discussed from the perspectives of (1) determining an individual's risk for delirium, (2) detecting and diagnosing delirium, and (3) identifying the causal agent(s). Strategies for preventing and treating delirium also are delineated. Finally, information for friends and family is provided.

Risk

Several previous studies have identified and quantified the risk for delirium. A multifactorial model of delirium etiology involving the complex interrelationships of predisposing (baseline host vulnerability) factors and precipitating (acute insults) factors has proven the most clinically useful in identifying and quantifying risk for delirium, while providing direction for minimizing such risk. Examples of predisposing factors include existing cognitive impairment, severe physical illness, multisensory impairment, and evidence of dehydration. Precipitating factors include elements of the acute illness and its treatment and care—for example, malnutrition, polypharmacy, use of physical restraints and other immobilizing devices, and iatrogenic events. Use of a multifactorial risk model can help identify those individuals at risk for delirium while providing direction for developing preventive strategies to target at risk patients (Inouye & Charpentier, 1996). Health care providers are encouraged to evaluate individuals' risk for delirium upon admission to the hospital and to reassess frequently throughout their hospitalization.

Diagnosis

Delirium remains underdiagnosed by health care professionals, and there are multiple explanations: semantic ambiguity, variation in the behavioral manifestation of delirium, similarity to and coexistence with dementia, failure of nurses and physicians to routinely use standardized methods of detection and screening, and a sense of not being able to influence the course and outcomes of delirium once diagnosed (Foreman, Fletcher, Mion, Trygstad, & NICHE Faculty, 1999). However, there is much evidence confirming that modest educational interventions with health professionals can increase the detection of delirium and thereby improve the outcomes for such patients. Experts recommend the routine use of brief, standardized, bedside screening measures as a timely, effective, and inexpensive method for assessing cognitive status and diagnosing delirium. Current standards for surveillance of delirium (e.g., Foreman et al., 1999) in this vulnerable patient population are to screen for the presence of delirium on admission to the hospital and, at a minimum, daily. Additionally, when there is evidence of new inattention, unusual or inappropriate behavior or speech, or noticeable changes in the way the patient thinks, it is recommended that the assessment be repeated.

Assessment Instruments

Numerous instruments have been developed to screen for or diagnose delirium. Such instruments include Folstein's Mini-Mental State Examination (MMSE), Inouye's Confusion Assessment Method (CAM), Vermeersch's Clinical Assessment of Confusion-Form A (CAC-A); Albert's Delirium Symptom Interview (DSI), Trzepacz's Delirium Rating Scale (DRS), Neelon and Champagne's NEECHAM Confusion Scale (NEECHAM), O'Keefe's Delirium Assessment Scale (DAS), and Breitbart's Memorial Delirium Assessment Scale (MDAS). Each has its advantages and disadvantages; the selection of which instrument to use depends in part on the purpose and patient population. The most frequently used instrument in research and clinical practice is Inouye's CAM.

Etiologies

An imbalance in the cholinergic and dopaminergic neurotransmitter systems is most commonly implicated in the neuropathogenesis of delirium. Imbalances in these neurotransmitter systems have a multifactorial origin. Those most commonly implicated in cholinergic and dopaminergic imbalances include (1) pharmacologic agents (both intoxication and withdrawal), especially those used for sedative-hypnotic purposes; (2) dehydration, with and without electrolyte disturbances; (3) hypoxia; (4) infection, especially upper respiratory and urinary tract; (5) metabolic disturbances; and (6) nutritional deficiencies.

Interventions

There are few studies of the effectiveness of systematic interventions to prevent or treat delirium; most have resulted in only modest benefits. Many interventions appear to be most effective in surgical patients and are aimed toward prevention rather than treatment (Milisen, Lemiengre, Braes, & Foreman, 2005). The prevailing principles guiding prevention and treatment consist of (1) identify patients at risk; (2) target strategies to minimize or eliminate the occurrence of precipitating factors (primary prevention is accomplished through risk reduction); (3) identify, correct, or eliminate the underlying cause(s) while providing symptomatic and supportive care; and (4) effective solutions require multifactorial interventions. The multicomponent intervention, called the Hospital Elder Life Program (HELP) (Inouye et al., 1999; Inouye, Bogardus, Baker, Leo-Summers, & Cooney, 2000), consisted of six standardized protocols for managing specific risk factors for delirium: cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment, and dehydration. This risk-factor intervention strategy resulted in significant reductions in the number and duration of episodes of delirium in hospitalized older patients. However, they found that the intervention had no significant effect on the severity of delirium or on recurrence rates. Once delirium occurred, the intervention was less effective and efficient. Thus, primary prevention is the most effective treatment strategy. Although this multicomponent intervention shows great promise, much remains unknown about effective strategies to treat delirium in this vulnerable patient population. Given shorter hospital stays and changing demographics, recent studies have also begun to focus more on interventions for specialized populations of delirium such as the ICU patient and patients discharged to postacute care facilities (Bergmann, Murphy, Kiely, Jones, & Marcantonio, 2005).

Conclusions

In summary, the following recommendations are provided for the care of older hospitalized patients:

1. Identify and quantify risk for delirium upon admission and at regular intervals.

2. Promptly initiate strategies to reduce risk factors.
3. Systematically and routinely screen for the detection and diagnosis of delirium in vulnerable patients at regular intervals, with sudden changes in attention, behavior, or thought, and patient self-reports of feeling mixed-up or having muddled thoughts.
4. Consider information from family and friends as important in the diagnosis of delirium. In such instances, consider delirium rather than worsening dementia.
5. Understand that the neuropathogenesis of delirium is multifactorial.
6. Include in pharmacotherapy for symptomatic and supportive therapy the following:
    a. Somatic interventions: haloperidol versus atypical neuroleptics
    b. Pain management: avoid use of meperidine HCl
    c. Nonpharmacologic interventions to promote sleep
    d. Medication reviews (to include over-the-counter and home or folk remedies)
        i. to minimize use of problematic medications (e.g., those with anticholinergic side effects, sedative-hypnotics, H2 blockers)
        ii. to detect drug-drug and drug-nutrient interactions
7. Create a therapeutic and protective environment by:
    a. Promoting meaning and orientation
    b. Balancing sensory stimulation
    c. Incorporating normal diurnal variations in lighting and activity
    d. Avoiding invasive and overstimulating situations
    e. Promoting continuity
    f. Providing appropriate individual cognitive stimulation
8. Include the following therapeutic interpersonal approaches for the elderly:
    a. Ensuring continuity of formal caregivers
    b. Including family and friends in caregiving
    c. Employing appropriate affective approaches

DONNA M. FICK
MARQUIS FOREMAN
SHARON INOUYE

See also

Behavioral Symptoms in Patients With Dementia
Cognition Instruments
Dementia: Overview
Hospital Elder Life Program (HELP)
Mild Cognitive Impairment: Controversy in Nomenclature and Treatment
Psychological/Mental Status Assessment

Internet Resources

American Psychiatric Association Practice Guideline for Delirium
http://www.psych.org/psych_pract/treatg/pg/pg_delirium.cfm

Hartford Foundation Try This Issues 3, 13, and Dementia Series
http://www.hartfordign.org/resources/education/tryThis.html

The Hospital Elder Life Program
http://elderlife.med.yale.edu/public/public-main.php

ICU Delirium and Cognitive Impairment Study Group
http://www.icudelirium.org/delirium/index.html

REFERENCES

Bergmann, M. A., Murphy, K. M., Kiely, D. K., Jones, R. N., & Marcantonio, E. R. (2005). A model for management of delirious postacute care patients. *Journal of the American Geriatrics Society*, *53*, 1817–1825.

Fick, D. M., Kolanowski, A. M., Waller, J. L., & Inouye, S. K. (2005). Delirium superimposed on dementia in a community-dwelling managed care population: A 3-year retrospective study of occurrence, costs, and utilization. *Journal of Gerontology*, *60A*(6), 748–753.

Foreman, M. D., Fletcher, K., Mion, L. C., Trygstad, L. J., & NICHE Faculty (1999). *Assessing cognitive* *function*. In I. Abraham, M. M. Bottrell, T. T. Fulmer, & M. D. Mezey (Eds.), *Geriatric Nursing Protocols for Best Practice* (pp. 51–61). New York: Springer.

Inouye, S. K., Bogardus, S. T., Jr., Baker, D. I., Leo-Summers, L., & Cooney, L. M., Jr. (2000). The hospital elder life program: A model of care to prevent cognitive and functional decline in older hospitalized patients. Hospital elder life program. *Journal of the American Geriatrics Society*, *48*, 1697–1706.

Inouye, S. K., Bogardus, S. T., Jr., Charpentier, P.A., Leo-Summers, L., Acampora, D., Holford, T. R., et al. (1999). A multicomponent intervention to prevent delirium in hospitalized older patients. *New England Journal of Medicine*, *340*, 669–676.

Inouye, S. K., & Charpentier, P. A. (1996). Precipitating factors for delirium in hospitalized elderly persons: Predictive model and interrelationship with baseline vulnerability. *Journal of the American Medical Association*, *275*, 852–857.

Leslie, D. L., Zhang, Y., Bogardus, S. T., Holford, T. R., Leo-Summers, L. S., & Inouye, S. K. (2005). Consequences of preventing delirium in hospitalized older adults on nursing home costs. *Journal of the American Geriatrics Society*, *53*, 405–409.

Milisen, K., Lemiengre, J., Braes, T., & Foreman, M. D. (2005). Multicomponent intervention strategies for managing delirium in hospitalized older people: Systematic review. *Journal of Advanced Nursing*, *52*, 79–90.

DEMENTIA: NONPHARMACOLOGICAL THERAPY

Older adults with Alzheimer's disease (AD) suffer progressive cognitive, behavioral, and affective and functional losses. AD is the most common type of irreversible, degenerative dementia, with an estimated 4.5 million Americans currently afflicted. Research to date has focused primarily on the biomedical aspects of the disease, such as pathology and pharmacological interventions for cognitive symptoms. Yet, the behavioral symptoms are some of the most difficult manifestations for caregivers (both family and professional) and occur throughout the disease trajectory. Treatment of behavioral symptoms remains primarily pharmacological, with antipsychotics the most common agents utilized. Although pharmacological agents have demonstrated some efficacy for specific symptoms of dementia, such as psychosis, the adverse side effects of these drugs cause clinicians to constantly weigh the risk–benefit ratio in prescribing for the confused older adult. Research efforts are attempting to identify behavioral strategies to augment pharmacological management. However, with few exceptions, the studies of nonpharmacological behavioral interventions have been anecdotal and have not included rigorous, systematic research designs.

Behavioral Symptoms

Behavioral symptoms of AD are problematic for older adults with dementia, as well as for their family and professional caregivers. Symptoms include physical and verbal aggression or screaming, resistance to care, wandering, difficulties with personal hygiene and care, and apathy or withdrawal. Family caregivers report that behavioral problems are a major source of stress and a major reason for the decision to institutionalize their family member. Behavioral symptoms result from the four main cognitive effects of AD: amnesia (loss of memory), aphasia (impairment of communication), agnosia (inability to comprehend or recognize objects), and apraxia (inability to use objects properly). Successful nonpharmacological behavioral interventions are structured to compensate for cognitive deficits and maximize the individual's residual capabilities. Agitation as a behavioral symptom is a commonly cited reason for prescribing antipsychotics in confused older adults. Yet, the term *agitation* is nonspecific, and there is no accepted definition among clinicians. Usually, the person described as agitated exhibits specific behavioral manifestations, such as physical aggression or screaming. Specifying the types of agitated behaviors is crucial for assessment, treatment, and evaluation of interventions.

Physical aggression, including hitting, kicking, slapping, and biting, can pose a serious threat to confused older adults and their caregivers. Physically aggressive behaviors often occur when caregivers are attempting to provide personal care. Catastrophic reactions are the most severe overreactions resulting in physical or verbal aggression. Antipsychotics, such as haloperidol and risperidone, have demonstrated some effectiveness in treating aggressive behaviors. Anticonvulsants such as carbamezepine have also been used, with many new agents being tested. The adverse side effects of these drugs—increased confusion, extra-pyramidal symptoms, falls, and an increased risk of cardiovascular events—make judicious use essential. Physical restraints often increase aggression and are not associated with a decrease in falls (Capezuti, 2004).

Researchers, clinicians, and caregivers have reported several successful nonpharmacological approaches to physical aggression (Barrick, Rader, Hoeffer, & Sloane, 2001; Mace & Rabins, 1999). Decreasing environmental stimuli (e.g., noise, activity) to a more tolerable level may decrease frustration and avoid increasing confusion. Approaching the person from the front and maintaining eye contact before touching him or her may facilitate communication and help decrease misperceptions that may trigger aggression. Persons with AD may have co-morbid sensory losses and the appropriate prostheses (e.g., hearing aides, glasses) should be available to optimize communication and interaction with the environment. Reality orientation (i.e., correcting misperceptions) may be useful in the early stages of AD, but as the person's cognitive deficits increase, this approach often causes increased frustration for the confused adult.

Validation therapy (Feil, 2002) attempts to uncover the message hidden in the confused person's disrupted communication. The method uses a nonconfrontational style, allowing the confused adult to set the tone and direction of the interaction. In any encounter in which a person becomes physically aggressive, it is important to remain calm and approach the person in a nonthreatening, nonjudgmental manner. Gentle distraction or redirection to a preferred activity often diffuses the situation and allows the person an opportunity to regain control.

Verbal aggression or screaming, other common behavioral symptoms, are treated primarily with pharmacological agents. One-to-one focused activities may be helpful, but these strategies do not eliminate this troublesome symptom. As with all behavioral symptoms, assessment and treatment for pain is essential to minimize exacerbation of behavioral symptoms and minimize suffering. Assessing and intervening for pain in persons with dementia is fraught with many challenges, including difficulties in assessing behaviors as pain-related and problems with optimizing pain management in older adults (Miller et al., 2005).

Wandering is a behavioral symptom that can pose a serious threat to the safety of confused older adults. A number of strategies have been attempted, including using structured activities, camouflaging exits, or using visual barriers (black horizontal or crosshatched lines on floor) to deter wandering through an exit. Wandering gardens and indoor environments have been designed that are aesthetically pleasing and provide a safe area to wander. Another safety device is a sensor worn by the client that alerts the staff when he or she is approaching an unsafe area. Some sensor devices lock an exit door as the confused adult approaches. Physical restraints, including geri-chairs, are sometimes used to provide safety but are associated with increased agitation and deconditioning. Pharmacological agents are not effective against wandering and are associated with movement disorders and falls.

Socially inappropriate behaviors may result from misperceptions, impulsivity, or disinhibition. Behaviors such as disrobing in public might signal the need to toilet. Confused adults might act inappropriately, believing staff or unrelated persons to be their family members or even their spouse. A person with AD might take items that belong to others. Managing these behaviors usually requires that family and staff understand that these actions are based on misconceptions or the person's inability to manipulate environmental demands appropriately. A nonconfrontational approach, redirection, or diversion to preferred activities is usually helpful in dealing with these behaviors. Persons who exhibit sexual behaviors, such as masturbation or fondling, may be removed to a more private area. Institutions and families need to work together to plan strategies for overt sexual behaviors. In addition, staff and families need to be aware of their own cultural biases regarding overt sexual behavior.

Communication is a vital component of behavioral treatment strategies. The communication abilities of confused adults vary widely, based on the degree of receptive and expressive aphasia they experience. Sensory impairments (visual and auditory) further complicate their ability to communicate. Several verbal and nonverbal techniques are recommended to enhance communication and facilitate use of the client's residual abilities: speaking clearly; using short, simple sentences; allowing ample time for the person to respond; maintaining eye contact; using appropriate nonverbal gestures; attempting to understand the client's verbal communication (as fragmented as it may be); and attending to nonverbal gestures or posturing. Caregivers who are familiar with the person are often more sensitive to subtle verbal and nonverbal communication.

Functional Symptoms

Functional deficits include deficits in dressing, grooming, and toileting. Cued or prompted toileting is a common strategy for incontinence in the early stages of AD. Cued toileting consists of a caregiver toileting the person on a timed schedule, based on the individual's pattern of urinating and defecating. Beck et al. (1997) demonstrated that training nursing staff to segment dressing tasks maximized confused adults' independence without significantly increasing staff time. Behavioral interventions need to be individualized to maximize remaining abilities and compensate for tasks that the confused adult can no longer manage.

Nutritional problems also prevail throughout the course of the illness, often beginning with difficulty shopping or cooking and progressing to swallowing disorders in the latter stages of the disease. Frequent small meals are recommended for confused adults with poor appetites or for those who cannot tolerate sitting for an entire meal. Finger foods are another nutritional strategy, especially as the client loses the ability to use eating utensils.

Dementia Special Care Units

Many long-term-care facilities have opened dementia special care units (SCUs). Although these units vary in the types of services they provide, they typically include specialized staff training, environmental safety features, and dementia-specific programming. Efforts are made to include the family on the interdisciplinary team and to offer support to family members in the form of individual or group services. However, due to a lack of standardized criteria and rigorous research methodologies, the efficacy of SCUs has not yet been established.

Family Caregivers

Family caregivers are the most important component in treating people with AD. The majority of older adults with dementia live in the community, and the vast majority of them are cared for at home by their families. Caring for these older adults is often physically and emotionally challenging. Several organizations, including the Alzheimer's Association, provide information and services to family caregivers. Mace and Rabins (1999) offer numerous strategies for family members caring for confused adults in the community and in most health care settings. For example, persons who tend to wander at a particular time of day (e.g., early evening) can be distracted by an alternative activity, such as afternoon tea and cookies. Bathing is another difficult activity that can be made more pleasant by innovative strategies such as partial baths, sponge-bathing, or scented towels.

Affective Symptoms

Apathy and withdrawal may signal depression in clients with Alzheimer's disease as well as being symptoms of dementia. Evaluation of depression is difficult due to the person's limited ability to self-report symptoms. The differentiation between symptoms of dementia and depression is a challenge requiring input from multiple members of the care team (Wolfs, Dirksen, Severens, & Verhey, 2006). Confused older adults with any mood symptoms should be evaluated by a mental health specialist or geriatric health care professionals. In addition to pharmacological treatments, many nonpharmacological treatments, such as individual and group psychotherapy and activity therapies, have been successfully used to treat depression in confused adults (Sadavoy, Lazarus, Jarvik, & Grossberg, 1996).

Mary Shelkey

See also

Behavioral Symptoms in Patients With Dementia
Caregiver Burden
Caregiver Burnout
Dementia: Pharmacological Therapy
Dementia: Special Care Units
Family Care for Elders With Dementia
Validation Therapy

Internet Resources

Alzheimer's Association
http://www.alz.org

Alzheimer's Disease Education and Referral Center
http://www.alzheimers.org

National Family Caregivers Association
http://www.nfcacares.org

REFERENCES

Barrick, A., Rader, J., Hoeffer, B., & Sloane, P. (2001). *Bathing without a battle: Personal care of individuals with dementia*. New York: Springer Publishing Company.

Beck, C., Heacock, P., Mercer, S. O., Walls, R. L., Rapp, C. G., & Vogelpohl, T. S. (1997). Improving dressing behavior in cognitively impaired nursing home residents. *Nursing Research*, *46*(3), 126–132.

Capezuti, E. (2004). Minimizing the use of restrictive devices in dementia patients at risk for falling. *Nursing Clinics of North America*, *39*(3), 625–647.

Feil, N. (2002). *The Validation Breakthrough: Simple techniques for communicating with people with Alzheimer's-type dementia*. Baltimore, MD: Health Professions Press.

Mace, N. L., & Rabins, P. V. (1999). *The 36-hour day: A family guide to caring for persons with Alzheimer disease, related dementing illnesses, and memory loss in later life*. Baltimore, MD: The Johns Hopkins University Press.

Miller, L. L., Talerico, K. A., Rader, J., Swafford, K., Hiatt, S. O., Millar, S. B., et al. (2005). Development of an intervention to reduce pain in older adults with dementia: Challenges and lessons learned. *Alzheimer's Care Quarterly*, *6*(2), 154–167.

Sadavoy, J., Lazarus, L. W., Jarvik, L. F., & Grossberg, G. T. (1996). *Comprehensive Review of Geriatric Psychiatry*. Washington, DC: American Psychiatric Press.

Wolfs, C. A., Dirksen, C. D., Severens, J. L., & Verhey, F. R. (2006). The added value of a multidisciplinary approach in diagnosing dementia: A review. *International Journal of Geriatric Psychiatry*, *21*(3), 223–232.

DEMENTIA: OVERVIEW

Dementia is diagnosed when there is an acquired, permanent deterioration of memory and other cognitive skills that causes significant impairment in social or occupational functioning (American Psychiatric Association, 1994). The prevalence of dementia increases significantly with age; it occurs in 5% to 8% of individuals older than age 65, 15% to 20% of those older than 75, and 25% to 50% of those older than age 85. The most prevalent form of dementia is Alzheimer's disease, accounting for 55% to 70% of all cases, followed by vascular dementia (15% to 25%) and Lewy Body dementia (12% to 20%). Individuals may also have a mixed dementia consisting of more than one type–for example, Alzheimer's disease plus vascular (Hemels, Lanctot, Iskedjian, & Einarson, 2001; Mendez & Cummings, 2003).

Diagnosis

Dementia is a clinical syndrome of symptoms with many different causes and varying courses. Some dementias, such as certain cases of vascular dementia, have a more stable projection; others, such as

Alzheimer's disease, cause more progressive deterioration. Formal criteria for the diagnosis of dementia include a significant decline in function, considerable impairment in memory, and decline in at least one other area of cognitive functioning. Areas of cognitive deterioration include aphasia (i.e., language impairment), apraxia (i.e., impairment of motor activities in the absence of motor deficits), agnosia (i.e., inability to recognize previously meaningful stimuli in the absence of sensory difficulties), and executive functioning (i.e., difficulty planning, sequencing, organizing, or engaging in abstract thinking) (*DSM-IV-TR*; American Psychiatric Association, 1994).

The differential diagnosis of dementia requires a detailed history and physical as well as neurological examinations. Obtaining information regarding the patient's history through caregivers is essential because many patients with memory problems have a difficult time providing pertinent information. Current guidelines for dementia assessment by the American Academy of Neurology (2001, reaffirmed 02/13/2004) include a clinical examination using the previously mentioned *DSM-IV-TR* dementia criteria; structural neuroimaging (noncontrast-computed tomography or magnetic resonance scan); and labs to assess for B_{12} deficiency and hypothyroidism.

When symptoms are mild or the diagnosis of dementia is uncertain, neuropsychological testing may be beneficial in further clarifying areas of cognitive difficulty. These tests evaluate cognitive abilities such as memory, visual-spatial skills, and language, and compare performance with age- and education-matched normative data.

Delirium (or acute confusional state) is important to rule out when assessing for dementia. Older adults are particularly susceptible to delirium because of the higher incidence of systemic illnesses in this population and their greater vulnerability to the adverse effects of polypharmacy. Memory impairment is present in both delirium and dementia. A sudden onset of symptoms, impairment in attention, and fluctuating symptoms suggest delirium. In addition, the impairments seen in dementia persist, whereas those seen in delirium typically resolve once the underlying medical issue is addressed. Although dementia cannot be diagnosed in the presence of delirium, it is possible for delirium to be present in a person with dementia and, in fact, patients with dementia are at greater risk to develop delirium (American Psychiatric Association, 1994).

Depression in older adults is the most common cause of dementia associated with a psychiatric illness. As with delirium and dementia, depression and dementia may coexist and, in these cases, the depression often responds to medications or behavioral changes, just as in cases of depression without dementia. In addition, some mood symptoms improve when an acetylcholinesterase inhibitor is initiated to treat the dementing illness. Nondemented older adults experiencing a major depressive disorder also frequently complain of memory problems and report difficulties thinking and concentrating (i.e., dementia syndrome of depression, or pseudodementia). On mental-status screens, depressed individuals may have poor attention and think that they are "failing," although their performance is usually better than they expect. With treatment of the depressive symptoms, the cognitive complaints often resolve; nearly 50% of patients with a "dementia syndrome of depression" go on to develop irreversible dementia within 5 years, however (Mendez & Cummings, 2003).

Interventions

A wide variety of medications is used to attempt to maintain cognitive abilities and improve functional status.

Patients frequently develop behavioral symptoms as a part of their dementing illness. Behavioral interventions for hallucinations, delusions, agitation, aggressive behavior, disinhibition, anxiety, apathy, and sleep disturbances are often helpful. For example, adequate stimulation during the day may ameliorate a sleep disorder. If behavioral strategies are insufficient, psychotropic medications can be useful adjuncts in managing behaviors and treating psychiatric symptoms, although these may increase mortality risk Patients with dementia require supervision according to the type and severity of specific cognitive limitations. Patients with significant cognitive impairment might not be safe alone at home; might improperly administer medications; be unable to cope with a household emergency; or use the stove, power tools, or other equipment appropriately.

Risks for Demented Individuals

Demented individuals are at particular risk for elder abuse or neglect because of their limited ability to protest and the added demands and strain on caregivers. Any concern, especially one raised by the patient, must be thoroughly evaluated. Corroborating evidence (e.g., from physical examination) should be sought to distinguish delusions, hallucinations, and misinterpretations from actual abuse. In addition, dementia patients are at high risk for self-neglect (e.g., forgetting or overtaking medications, eating improperly, generally poor self-care), and financial abuse.

Patients with dementia may be at risk due to wandering. Referrals to the Safe Return Program of the Alzheimer's Association (1-800-621-0379) or similar options provided by local police departments or other organizations are appropriate for many families.

The patient and family must be counseled about driving and other activities that put themselves and others at risk. In California and some other states, physicians are required to report a diagnosis of dementia to the Health Department, which then informs the Department of Motor Vehicles.

Costs

Dementia exacts a major financial toll. The combined direct and indirect costs of medical and long-term care, home care, and lost caregiver productivity exceed $100 billion a year in the United States, about 10% of all health care expenditures. Medicare, Medicaid, and private insurance cover a portion of this expense, but the balance is borne by families who care for demented patients (Mendez & Cummings, 2003; Moore, Zhu, & Clipp, 2001).

Caregiving

Providing care for a loved one with dementia can be stressful; as many as 50% of family caregivers suffer from depression. Caregivers can become isolated, fearful of physical harm, and physically and emotionally overwhelmed by the demented patient's needs. A substantial literature reinforces the value of support groups, especially those combining information with emotional support. The Alzheimer's Association is an excellent resource for support groups and other information and assists those with any type of dementia, not just Alzheimer's disease.

Caregiver education in managing and living with a person with dementia includes keeping directions simple (e.g., one-step commands) and avoiding overly complex tasks that might lead to frustration; avoiding confrontation and deferring requests if the patient becomes angered; remaining calm, firm, and supportive if the patient becomes upset; being consistent and avoiding unnecessary change; providing frequent reminders, explanations, and orientation clues; recognizing declines in capacity and adjusting expectations appropriately; and bringing sudden declines in function and the emergence of new symptoms to professional attention.

Respite care is often beneficial because it temporarily relieves the caregiver from the responsibilities of caring for a demented individual and can provide additional positive stimulation for the person with dementia. Respite care may last for a few hours a day or for weeks to months (depending on the locus of respite care) and may be provided through companions, home health aides, visiting nurses, daycare programs, and brief nursing-home stays or other temporary overnight care.

Legal counsel for patients and families should be recommended early in the course of the illness, while the patient is sufficiently competent to participate in decision making, including testamentary wills and advance directives. When family caregivers are no longer able to care for the demented patient at home, they will benefit from both logistical and emotional support in placing the patient in an assisted-living facility or a nursing home.

Stacy Schantz Wilkins
Shawkat Dhanani

See also

Behavioral Symptoms in Patients With Dementia
Mild Cognitive Impairment: Controversy in Nomenclature and Treatment
Vascular and Lewy Body Dementias

Internet Resources

Alzheimer's Association
http://www.alz.org

American Academy of Neurology
http://www.aan.com

American Psychiatric Association
http://http://healthyminds.org/mentalhealthofelderly.cfm

Family Caregiver Alliance
http://www.caregiver.org

National Institutes of Health, National Library of Medicine
http://www.nlm.nih.gov/medlineplus/dementia.html

REFERENCES

Knopman DS, DeKosky ST, Cummings JL, Chui H, Corey–Bloom J, Relkin N, Small GW, Miller B, Stevens JC. Practice parameter: Diagnosis of dementia. *Neurology* 2001;56:1143–1153. reaffirmed 02/13/2004.

American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (*DSM-IV-TR*). Washington, DC: American Psychiatric Association.

Hemels, M. E. H., Lanctot, K. L., Iskedjian, M., & Einarson, T. R. (2001). Clinical and economic factors in the treatment of behavioural and psychological symptoms of dementia. *Drugs and Aging*, *18*(7), 527–550.

Knopman, D. S., DeKosky, S. T., Cummings, J. L., Chui, H., Corey-Bloom, J., Relkin, N., et al. (2001). Practice parameter: Diagnosis of dementia (an evidence-based review): Report of the quality standards subcommittee of the American Academy of Neurology. *Neurology*, *56* (9), 1143–1153.

Mendez, M. F., & Cummings, J. L. (2003). *Dementia: A clinical approach* (3rd ed.). Philadelphia: Butterworth Heinemann.

Moore, M. J., Zhu, C. W., & Clipp, E. C. (2001). Informal costs of dementia care: Estimates from the Longitudinal Caregiver Study. *The Journals of Gerontology, Psychological Sciences and Social Sciences*, *56*(4), S219–S228.

Overshott, R., & Burns, A. (2005). Treatment of Dementia. *Journal of Neural Neurosurgery & Psychiatry*, *76* (suppl. V), v53–v59.

DEMENTIA: PHARMACOLOGICAL THERAPY

Dementia has become a major public health problem due to its increasing prevalence, long duration, caregiver burden, and high financial cost of care. Clinically, dementia predominantly affects cognition, behavior, functional activities, and caregiver burden. Therapeutic interventions for dementia aim to affect these four primary domains.

Currently there are no cures for most dementias. For the most common types, Alzheimer's disease (AD), vascular dementia (VaD), and mixed dementias, pharmacotherapy is often the primary intervention used to improve symptoms and delay the progression of the disease. Existing pharmacotherapeutic agents available to treat problems associated with dementia have varying levels of efficacy (Santaguida, 2004). These drugs are also being used to treat mild cognitive impairment (MCI) patients because they are known to have a 10% to 25 % conversion to dementia (Bischkopf, Busse, & Angermeyer, 2002).

Pharmacological agents vary significantly with respect to their therapeutic actions. The most common pharmacological agents used in North America modify the activity of cholinesterases—enzymes that degrade acetylcholine, a neurotransmitter that is critical to the neurons involved in cognition (e.g., memory, thought, and judgment). Other approaches include antioxidants that work by minimizing the effects of free radicals that are released through normal oxidative metabolism. These free radicals may cause neuronal damage and play a role in the development of dementia. Similarly, inflammation may contribute to nerve-cell damage and dementia; hence, anti-inflammatory drugs may decrease inflammation, potentially reducing nerve degeneration, which may in turn slow or even prevent dementia illnesses. In general, the efficacy of antioxidants (e.g., vitamin E) and anti-inflammatory drugs (e.g., nonsteroidal type) show some potential for protection against the development of Alzheimer's disease, but issues of dose and duration must be confirmed in randomized trials (Santaguida, 2004; Etminan, Gill, & Samii, 2003).

Other pharmacological interventions that have been studied include cholesterol-lowering agents, antihypertensives, hormones (e.g., estrogen), behavior- and mood-altering drugs, antiamyloid strategies (e.g., immunization, aggregation inhibitors, and secretase inhibitors), transition metal chelators, nerve-growth factors, and agents that target neurotransmitters other than acetylcholine and its receptors.

Drugs Approved Primarily for the Treatment of Dementia

The pharmacotherapeutic agents that treat problems associated with dementia have varying levels of efficacy. Currently, the U.S. Food and Drug Administration (FDA) has approved five drugs for managing dementia: cholinesterase inhibitors (ChEIs) (i.e., donepezil, galantamine, rivastigmine, and tacrine), which degrade acetylcholinesterase. This allows levels of acetylcholine (a neurotransmitter that is critical to the neurons involved in cognition; e.g., memory, thought, and judgment) to rise. The latest approved drug, memantine (a N-methyl-D-aspartate receptor [NMDA-R] antagonist), acts by preventing excess stimulation of the glutamate system (which influences memory and learning). Although FDA approval specifies use of these five drugs for dementia of the Alzheimer's type, in clinical practice they are used in clients with other dementia types.

The following summary describes the evidence for several important pharmacological interventions to treat dementia. They are classified in categories reflecting their pharmacological actions.

Cholinergic therapies

Abnormalities in the cholinergic system are consistently identified in Alzheimer's disease, Parkinson's disease, and Lewy Body disease. Systematic biochemical investigation of Alzheimer's patients' brains shows substantial deficits of cholinergic transmission in the hippocampus and cerebral cortex.

Several cholinergic therapies have been used in dementia populations (Santaguida, 2004). Four ChEIs have been approved for treatment by the FDA specifically for AD but are also used in clinical practice for other dementias. The four cholinesterase inhibitors (i.e., donepezil, galantamine, rivastigmine, and tacrine) block acetylcholinesterase and increase the availability of cholinesterase in brain synapses. ChEIs affect outcomes primarily in the domains of cognition and clinician global assessment. Improvement or maintenance of cognitive functions (e.g., memory, comprehension, orientation, and following commands) has been shown in most clinical trials, with tacrine being the exception. The summary estimates of the effect size on measures of cognition suggest that these changes or benefits are small and may not achieve clinical significance (Santaguida, 2004). For global clinical assessment outcomes, studies have consistently shown statistical differences relative to placebo (except tacrine). Because these global measures are rated by clinicians, any change may be considered clinically significant.

Outcomes of benefit in domains, such as activities of daily living (ADL) or quality of life (QOL), mood and behavior, and caregiver burden, have not been evaluated as extensively, nor have these drugs been shown to be effective in these domains. Adverse events with ChEIs are primarily associated with gastrointestinal problems (i.e., nausea and vomiting, diarrhea) and eating disorders/weight loss, which are consistent with this class of drugs. Adverse events increase in frequency at higher drug doses. Studies using tacrine showed higher rates of withdrawal due to adverse events; there appears to be greater potential for abnormal liver tests with this particular ChEI. Although it is approved for Alzheimer's patients, it is rarely prescribed in the United States.

Most studies on ChEIs have evaluated subjects of mild to moderate severity for relatively short periods. In addition, these studies tended to exclude patients with other co-morbidities, which may not reflect the typical patient with dementia.

Anti-glutamate therapies (memantine)

The most recently approved drug, memantine, acts by preventing excess stimulation of the glutamate system, which influences memory and learning. Memantine (1-amino-3,5-dimethyladamantane hydrochloride) is an uncompetitive N-methyl-D-aspartate receptor (NMDA-R) antagonist. Memantine inhibits excess stimulation of the NMDA receptors and has the potential to provide both symptomatic improvement and neuro-protective effects.

A recent systematic review suggests that memantine affects cognition and clinical global assessment, with an effect size similar to that of the ChEIs (Santaguida, 2004). Outcomes of benefit in other domains are limited but would suggest improvement in QOL/ADL in moderate to severe AD subjects. Adverse events reported involved the gastrointestinal system, dizziness, agitation, and headache. The frequency of agitation was reported as less in some studies where patients had more severe disease. Memantine was tolerated well as a monotherapy and in conjunction with donepezil. The memantine trials evaluated mild to moderate VaD and moderate to severe AD populations. Although differences in cognition, global assessment, ADL, and caregiver burden were maintained for the course of the study, the short time frame does not allow for the determination of the potential of memantine for long-term use (i.e., longer than 28 weeks).

Mood-altering drugs

Individuals with dementias demonstrate several clinically significant behavioral and psychological symptoms that can include any of the following: depressive symptoms (apathy and disinterest), anxiety, irritability, lability, psychosis (hallucinations and delusions), agitation (including pacing, wandering, restlessness, inability to sit), aggression (both verbal and physical), euphoria/elation, aberrant motor behavior, sleep disturbances (day-night reversal, getting up to dress), and disinhibition (sexual behaviors such as verbal comments, masturbation, grabbing staff). Several medications have been used to address these symptoms and some have the potential for serious side effects, which may cause physicians prescribing them to deliberate the relative risks and benefits. As such, current best practice suggests that medication use, particularly of antipsychotics, be reserved for situations where safety and well-being of both patient and caregivers are at risk (Omelan, 2006). At the very least, behavior and environmental interventions should be implemented as a first attempt to manage the aberrant behaviors.

In general, the evidence for pharmacological treatment of behavioral problems in dementia patients is limited. Difficulty in drawing conclusions is, in part, related to variations in doses and indications for the drug use. The classes of drugs used to treat behavioral problems in dementia patients are summarized in the following subsections.

Antipsychotic therapies

Several antipsychotic medications have been used extensively in dementia patients to manage behavioral symptoms such as aggression. Those most commonly used include halperiodol, loxapine, melperone, perphenazine, thioridazine, and tiapride, and these have great propensity for serious side effects. Halperidol has been used extensively but, in general, the clinical trials of typical antipsychotic drugs for dementia are of poor quality and small sample size (Santaguida, 2004). These studies suggest inconsistent evidence for effectiveness in managing behavior problems in dementia. Mixed results were observed for improvement in clinical global assessment and none significantly impacted caregiver burden. Although adverse events have not been well reported, some of the most important harms include increased risk of falls, aberrant hemotology, extrapyramidal symptoms, and increased confusion.

Atypical antipsychotic medications such as ariprazole, quetiapine, ziprasidone, clozapine, olanzepine, and risperidone have also been used to manage behavior disturbances in dementia patients. Of these, olanzapine and risperidone have been studied more frequently in randomized trials relative to the other drugs. Evidence for both these drugs is not extensive but would suggest some efficacy in managing behavior problems associated with dementia (Lee et al., 2004). Adverse events reported with risperidone and olanzapine include extra-pyramidal symptoms and somnolence. Atypical antipscyhotic drugs act more rapidly and lack some of the more serious side effects of typical antipsychotics. The FDA has posted a black-box warning for atypical neuroleptics, indicating caution when prescribing these. Data suggest that both types of antipsychotics may increase mortality rates; however, the conventional drugs show a slightly greater risk than the atypical drugs (Wang et al., 2005). In either case, use of antipsychotic medications necessitates consultation with family members and careful consideration of the benefits and harms of using these drugs.

Sedative hypnotic therapies

Some types of sedative hypnotics, predominantly benzodiazepines (also known as minor tranquilizers), have been used in dementia patients to provide short-term relief of severe, disabling anxiety or insomnia; these include alprazolam, lorezepam, and oxazepam. Long-term use of these drugs can be problematic due to the development of tolerance and dependency (Schneeweiss & Wang, 2005). They are believed to act on the GABA receptor $GABA_A$, the activation of which dampens higher neuronal activity. Although the manner of use of these drugs in clinical practice to treat dementia is not well established, clinical trials suggest that they are used to relieve anxiety, agitation, or sleep disturbances. The evidence for these drugs is of poor quality and limited (Santaguida, 2004).

Antidepressant therapies

Antidepressants are used to manage behavior problems in dementia patients with accompanying depressive symptoms (up to 25% of patients have major depressive symptoms). Three main classes of antidepressant medications used in dementia populations include (1) selective serotonin reuptake inhibitors (SSRI) (e.g., citalopram, setraline), (2) tricyclic antidepressants (TCA) (e.g., amitriptyline, imipramine), and (3) tetracyclic antidepressants (e.g., maprotiline, tradozone). Serotonin norepinephrine reuptake inhibitors have not yet been evaluated in dementia patients. In general, few trials of these drugs showed significant improvement in behavior (Sink, Holden, & Yaffe, 2005) because many of the individual trials have very small sample sizes. For those drugs that have been better evaluated (e.g., setraline), the results across studies suggest mixed benefits regarding behavior improvement (Lyketsos et al., 2003; Munro et al., 2004). Potential side effects include those consistent with the particular antidepressant drug class.

P. Lina Santaguida
Palminder Raina

See also

Behavioral Symptoms in Patients With Dementia

Internet Resources

Agency for Healthcare Research and Policy
http://www.ahrq.gov

The Alzheimer's Association
http://www. Alz.org

MedLine Plus
http://www.nlm.nih.gov/medlineplus/alzheimersdisease.html

REFERENCES

Bischkopf, J., Busse, A., & Angermeyer, M. C. (2002). Mild cognitive impairment: A review of prevalence, incidence and outcome according to current approaches. *Acta Psychiatrica Scandinavica*, *106*, 403–414.

Etminan, M., Gill, S., & Samii, A. (2003). Effect of non-steroidal anti-inflammatory drugs on risk of Alzheimer's disease: Systematic review and meta-analysis of observational studies. *British Medical Journal*, *327*,128.

Lee, P. E., Gill, S. S., Freedman, M., Bronskill, S. E., Hillmer, M. P., & Rochon, P. A. (2004). Atypical antipsychotic drugs in the treatment of behavioural and psychological symptoms of dementia: Systematic review. *British Medical Journal*, *329*, 75.

Lyketsos, C. G., DelCampo, L., Steinberg, M., Miles, Q., Steele, C. D., Munro, C., et al. (2003). Treating depression in Alzheimer disease: Efficacy and safety of sertraline therapy, and the benefits of depression reduction: the DIADS. *Archives of General Psychiatry*, *60*, 737–746.

Munro, C. A., Brandt J., Sheppard, J. M. E., Steele, C. D., Samus, Q. M., Steinberg, M., et al. (2004). Cognitive response to pharmacological treatment for depression in Alzheimer's disease. *American Journal of Geriatric Psychiatry*, *12*, 491–498.

Omelan, C. (2006). Approach to managing behavioural disturbances in dementia. *Canadian Family Physician*, *52*, 191–199.

Santaguida, L., Raina, P., Booker, L., Patterson, C., Baldassarre, F., Cowan, D., et al. (2004). *Pharmacological Treatment of Dementia, # 97.* Agency for Healthcare Research and Quality. Evidence Report/Technology Assessment (prepared by McMaster University).

Schneeweiss, S., & Wang, P. S. (2005). Claims data studies of sedative-hypnotics and hip fractures in older people: Exploring residual confounding using survey information. *Journal of the American Geriatrics Society*, *53*, 948–954.

Sink, K. M., Holden, K. F., & Yaffe, K. (2005). Pharmacological treatment of neuropsychiatric symptoms of dementia: A review of the evidence. *Journal of the American Medical Association*, *293*, 596–608.

Wang, P. S., Schneeweiss, S., Avorn, J., Fischer, M. A., Mogun, H., Solomon, D. H., et al. (2005). Risk of death in elderly users of conventional vs. atypical antipsychotic medications. *New England Journal of Medicine*, *353*, 2335–2341.

DEMENTIA: SPECIAL CARE UNITS

Nursing-home special care units (SCU) are one proposed solution to the problems presented by persons with dementia. In addition to needing assistance with basic activities of daily living (ADL) (e.g., bathing, grooming, toileting), elders with dementia are often anxious and agitated, frequently pace continuously, and often develop elopement and aggressive behaviors. These problems are difficult for staff to handle, resulting in increasing stress and burnout. In addition, family members often usually find it difficult to institutionalize their loved ones, experiencing guilt and loss, as well as difficulties releasing control over relatives' care. The SCU strategy is designed to reduce anxiety and agitation of persons with dementia, which in turn is expected to decrease staff and family caregiver stress.

After 2 decades of growth, more than 22% of nursing homes now have some kind of specialty unit for persons with dementia (Grant, 2002). More recently, dementia-specific assisted-living facilities have evolved in response to the estimated 50% to 68% of older persons now living in assisted living who have dementia (Rosenblatt et al., 2004). Originally, SCUs served persons with mild to moderate impairment but in the last decade, residents are more often in middle to late stages of the disease (Lichtenberg, Kemp-Havican, MacNeill, & Johnson, 2005). This may be in part due to the growth of dementia-specific assisted-living facilities.

Although most experts agree that SCUs are useful for managing persons with dementia, several issues remain unresolved. Disagreement remains between proponents of segregation and nonsegregation, advocates of reduced and increased stimuli, those who believe that rehabilitation strategies are useful and those who contend that environmental modification is most effective, and those who reject or embrace a medical versus social model of care. Lack of resolution of these issues is seen in the absence of standardization of SCU structures and processes and in the mixed research findings regarding their effectiveness.

Five features make an SCU special: (1) specific admission and discharge criteria, (2) staff selection and training according to accepted standards of care for persons with dementia, (3) activity programming designed for persons with cognitive impairments, (4) family programming and involvement in care of their relatives with dementia, and (5) segregated and modified environments that provide reduced but appropriate sensory stimuli (Teri, Holmes, & Ory, 2000).

Several theoretical frameworks guide programs and interventions for persons with dementia in nursing homes. Underlying the person-environ-\break ment fit (P-EF), person-environment interaction (P-EI), and progressively lowered stress threshold (PLST) models is the notion that the environment must be modified to enhance function in residents with dementia and assist caregivers in coping with their behaviors. The PLST model is most often used to develop SCUs and to evaluate the effects on residents, families, and staff. While there is evidence that environmental interventions are important and need to be tailored for individuals with dementia, more research is required to assess their effectiveness (Teri, Holmes, & Ory, 2000).

Medical, psychosocial, and rehabilitation models are also prominent. In the medical model, nursing homes resemble hospitals more than homes, emphasizing medical aspects of care rather than behavioral and social approaches, function, daily living, and quality of life. Few purely medical treatments address more than the symptoms of dementia. The social model of care emphasizes social aspects of care, including function and ADL but deemphasizes health promotion, prevention of disease, and management of co-morbid chronic conditions. The nursing model emphasizes the whole person in context (i.e., biophysical, psychosocial, environmental) and is more appropriate for addressing the health, sociobehavioral, and functional problems that typically accompany irreversible dementia and excessive disability.

Criteria for admission, discharge, and resident selection are key policies for an SCU. The diagnosis of dementia should be made after a comprehensive neuropsychological examination. The Alzheimer's Association's guidelines increase the reliability and validity of diagnosis. Preadmission assessment should describe the resident's behaviors; family and resident preferences, values, beliefs, and interests (preadmission and current); family support, understanding, acceptance, and desire for continued involvement in the care of the resident; and cognitive, physical, and social function within the preadmission social milieu. Preadmission assessment should address advance directives and resident and family preferences for end-of-life care. Admission criteria should also focus on appropriate placement to prevent avoidable relocation of the resident.

SCUs are often coordinated by registered nurses (RNs), but they may also be directed by individuals trained in social science or gerontology who are not RNs. The key concern is not who coordinates the SCU program but that interdisciplinary care is provided and that both the social and health needs of residents are addressed. There should be adequate staff to attend to the holistic needs of residents and their families, and all administrators and staff should be thoroughly trained in the care of older persons with dementia (Maas & Buckwalter, 2006). Nursing care should be managed by professional nurses with adequate assistance by staff who are trained in the care of persons with dementia.

Common nursing-home ratios of total nursing staff to residents are 1:5 to 1:6 and most SCUs have similar staffing levels as most general nursing-home units. Most lacking is a sufficient number of RNs who specialize in the care of persons with dementia. The ratio of specially trained RNs to residents on SCUs should be no less that 1:15 so that residents receive assessments and interventions by RNs who can also provide appropriate oversight, training, and role modeling for other staff members (Morgan, Stewart, D'Arcy, & Cammer, 2005). A social worker, physician, activities/recreation therapist, dietician, and physical therapist should be members of the care team.

Special training for all staff should address the specific needs of residents with dementia and their families and include education about dementia, its causes, common resulting behaviors, the effects of these behaviors on caregivers (staff and family), and appropriate principles and techniques for providing care. Classroom and clinical experiences allow staff to discuss and practice evidence-based care approaches.

Care based on a nursing model results in rehabilitative and psychosocial programming that provides (1) health promotion and illness prevention; (2) interventions and activities appropriate for the cognitive and functional abilities of residents; (3) interventions and activities relevant to the interests, strengths, values, heritages, and abilities of residents; and (4) individual and group activities to promote socialization, exercise, reminiscing, and sensory enjoyment. Recommended activities should approximate residents' real-life experiences, such as participating in hosting family and friends, preparing meals, dining family style, and games. Through such activities, residents are occupied and purposefully engaged, preventing boredom and agitation, which often result in pacing, rummaging, and other disruptive and socially inaccessible behaviors. These activities provide opportunities for residents to optimize, prolong, and enjoy their remaining functional abilities. Rest and activity must be balanced, thus decreasing agitated behaviors.

Individualized physical care should follow a consistent routine, emphasizing flexibility and unconditional positive regard. Care is provided when the resident can accept it. Waiting 5 minutes is often enough for the resident to be able to cooperate and be less fearful. Selectively used psychoactive medications can control symptoms—mainly anxiety, agitation, pain, and depression—that interfere with residents' responses, function, and comfort. Catastrophic reactions—responses that are out of proportion to stimuli—are managed by altering environmental stressors to accommodate individuals' abilities. Examples include reducing the number of people in the environment, decreasing noise, dimming lights; and using distraction to lessen fear, confusion, and agitation. It is also important to assess carefully for physical discomfort (i.e., pain) that may manifest in disturbing behaviors. Care should maintain resident safety without unduly restricting activity and behavior. Staff must vigilantly monitor residents' health status and identify adverse effects from medications or treatments. Because persons with dementia often cannot interpret or communicate pain and discomfort, monitoring behavioral clues is especially important. Awareness of conditions that are likely to cause discomfort or pain should guide assessment and intervention.

The physical environment should be modified to reduce overwhelming and disturbing stimuli and provide safe wandering, environmental cues to support memory, and visual, auditory, and other sensory stimulation. The environment should promote resident function and safety, create a homelike environment and an atmosphere that promotes family visitation and involvement, and provide a pleasant, functional workplace for staff. Each environmental component should be evaluated to consider the message it sends to residents and their families. Most residents tend to interact in a more socially acceptable manner in homelike "normal" environments. Finally, care must be taken to avoid residents' sensory deprivation and boredom. Too little stimulation can be as bad as too much, causing feelings and behaviors that are uncomfortable for residents and difficult for staff to manage.

SCUs should have a support program for families, starting prior to admission. A thorough orientation to the physical environment and to policies that govern resident care should be provided. Participation of families in the care of their relatives and decision making for them should be actively supported, with institutional barriers to their participation removed. Recommended strategies for family involvement include a "buddy system," a family–nurse liaison, and peer support groups (Maas, Reed, Specht, & Swanson, 2001).

Systematic evaluation shows that the effects of SCUs on resident, family, and staff outcomes are mixed. Consistently reported positive outcomes for SCU residents are reduced agitation, less catastrophic and disruptive behavior, decreased use of physical and chemical restraints, and increased socially accessible interactions, participation in activities, and improved quality of life (Reimer, Slaughter, Donalson, Currie, & Eliasziw, 2004). Although studies of staff effects are few, staff describe work as less stressful in SCUs. SCU personnel are also more knowledgeable about the care of persons with dementia than are those working in integrated units (Grant, 2002). Despite these benefits, staff turnover in SCUs is comparable to turnover in general nursing-home units. A small number of studies report family members' satisfaction with care in SCUs, including positive effects of involvement in the care of their relatives following institutionalization.

JANET P. SPECHT
MERIDEAN L. MAAS

See also

Assisted Living
Behavioral Symptoms in Patients With Dementia
Dementia: Nonpharmacological Therapy
Dementia: Overview
Dementia: Pharmacological Therapy
Depression in Dementia
Family Care for Elders With Dementia
Mild Cognitive Impairment: Controversy in Nomenclature and Treatment
Nursing Homes

Internet Resources

Alzheimer's Association
htpp://www.alz.org/Advocacy/priorities/longtermcare/specialcare.asp

Full Circle of Care
http://www.fullcirclecare.org/ltccontinuum/assisted.htm

Ideas Consulting
http://www.ideasconsultinginc.com

Inter-Generations
http://www.intergens.com/evalalz.html

Kansas Department of Aging
http://www.agingkansas.org/kdoa/publications/SpecialCare/HowtoSelect.pdf

National Institute on Aging
http://www.alzheimers.org

REFERENCES

Grant, L. A. (2002). Alzheimer's special care units. *Research in Practice, Center for the Study of Healthcare Management*. Minneapolis, MN: University of Minnesota.

Lichtenberg, P. A., Kemp-Havican, J., MacNeill, S. E., & Johnson, A. S. (2005). Pilot study of behavioral treatment in dementia care units. *The Gerontologist*, *45*(3), 406–410.

Maas, M. L., & Buckwalter, K. C. (2006). Providing quality care in assisted living facilities: Recommendations for enhanced staffing and staff training. *Journal of Gerontological Nursing*, *332(11)*, 14–22.

Maas, M. L., Reed, D., Swanson, E. A., & Specht, J. P. (2001). Family involvement in care: Negotiated family/staff partnerships in special care units for persons with dementia. In S. G. Funk, E. M. Tornquist, M. Miles, J. Harrell, & J. Leeman (Eds.), *Key Aspects of Preventing and Managing Chronic Illness*. New York: Springer Publishing Company.

Morgan, D. G., Stewart, N. J., D'Arcy, C., & Cammer, A. L. (2005). Creating and sustaining dementia special care units in rural nursing homes: The critical role of nursing leadership. *Canadian Journal of Nursing Leadership*, *18*(2), 74–99.

Reimer, M. A., Slaughter, S., Donalson, C., Currie, G., & Eliasziw, M. (2004). Special care facility compared with traditional environments for dementia care: A longitudinal study of quality of life. *Journal of the American Geriatrics Society*, *52*(7), 1085–1092.

Rosenblatt, A., Samus, Q., Steele, C., Baker, A., Harper, M. G., Brandt, J., et al. (2004). The Maryland Assisted Living Study: Prevalence, recognition, and treatment of dementia and other psychiatric disorders in the assisted living population of central Maryland. *Journal of American Geriatrics Society*, *52*(10), 1618–1625.

Teri, J. A., Holmes, D., & Ory, M. G. (2000). The therapeutic design of environments for people with dementia. *The Gerontologist*, *40*, 417–421.

DEMOGRAPHY OF AGING

Social scientists in a variety of disciplines consider it important to understand the process of *population aging* and its impact on society. Scholars in disciplines such as sociology, economics, psychology, and geography now devote considerable time to studying the aspects of population aging.

Increasingly, interdisciplinary research teams and perspectives are involved in the *demography of aging*, whether it is the aging of whole populations or that of a single cohort.

The process of population aging transforms the total population structure and its distribution in a variety of ways over time. For example, the population's composition according to marital status tends to change during a prolonged period of population aging. This change will in turn affect the population's distribution among different kinds of living arrangements.

The *aging of birth cohorts* throughout their life courses is becoming a major focus of the demography of aging. The process of aging of a major set of birth cohorts—such as the *baby boom* generation in North America, which comprises primarily those persons born between 1946 and 1966—has an important impact upon society. When aging cohorts enter the ranks of the older population, they may change its characteristics because they differ in behavior and composition from the cohorts departing the older population via deaths.

For example, in demography as well as other disciplines, the aging of the baby boom generation has been the subject of a growing body of literature. Because of its size and its distinctive behavior patterns, this generation has had a major effect upon social institutions and government policies at every stage of its maturation. There is great concern about correctly forecasting how it will alter institutions and policies that target the older population when its large numbers invade the main ages for retirement, starting in the second decade of this century.

The pace of population aging depends upon the aging processes and relative sizes of sequences of cohorts passing from birth to extinction. In turn, the impact of population aging upon society depends upon the pattern of succession among cohorts possessing different characteristics and passing through the older ages (Stone, 1999; Gauthier, Jean, Langis, Nobert, & Rochon, 2004).

The demography of aging also deals with the current demographic profile of the older population, as well as the changes in its numbers, proportionate size, composition, and territorial distribution. Moreover, this disciplinary field addresses the determinants and consequences of changes in attributes of the older population.

The Growing Controversy over What Constitutes Old

The emergence of population aging as a prominent concept in demography has rested partly on the notion that there is a meaningful and commonly accepted basis upon which to classify a person as being "old" or "elderly," or a member of the "older population." Over 2 decades ago, Siegel (1980) wrote that: "The demography of aging brings demographers to focus holistically on a population group, the elderly, and a demographic process, aging." The most common definition of population aging refers to an increase in the relative weight (percentage) of the older population. (Usually, this is accompanied by an increase in the average age of the population.)

For decades, it was commonly thought that a person could be considered old after age 65; more recently it is acknowledged that such a fixed age is a socially constructed age threshold that was set by governments primarily to demarcate an age beyond which people could gain access to certain classes of government benefits or work-related pension income. Just who is considered old, elderly, or a member of the older population has become a subject of important controversy.

In future years, the notion of *oldness* may be defined most usefully by 1 of 2 approaches: (1) survival for a certain number of years beyond the expected length of life of one's cohort, or (2) entry into an age group where the risk of frailty rises to unusually high levels (Robine & Michel, 2004). If approach 2 is used to establish the age threshold beyond which a person is said to be old, that threshold would probably be agreed upon as a fixed chronological age (probably the mid-80s or higher). However, if approach 1 is used, there would be a changing threshold depending upon the cohort in question.

Even the second approach may lead to a variable age threshold, if advances in the biology of aging and related lifestyle interventions were to permit the average age of onset of frailty to rise in future decades. That this is a prospect to be taken seriously is suggested in the 2002 work of Vaupel and his colleagues at the Max Planck Institute.

The rising challenge to the idea that a person is old simply because he or she has reached age 65 helps to shift the focus of the demography of aging away from a subpopulation of "the elderly" and toward aging as a dynamic, lifelong process for cohorts and historically for whole populations.

A recent feature of this shift has been an implicit broadening of the concept of population aging to take into account not only an increasing percentage of persons beyond a certain chronological age but also the proportions of such persons without moderate or severe disability (Robine & Michel, 2004). If it becomes widely accepted among demographers this idea will probably lead to an increased focus on the notion that "oldness" should be defined in terms of entry to chronological ages where the probability of frailty is much higher than average for the adult population. Even today, these are ages well above 65 years.

Despite the doubt now being cast upon 65 as a threshold beyond which a person is reasonably said to be old, this age remains an important marker in societies for reasons that deserve to be elaborated. In the social construction of opportunities to obtain or keep jobs, as well as that of access to certain kinds of government benefits, age 65 remains an important marker. Secondly, people beyond this age, but below ages where the probability of frailty becomes unusually high, are often considered to be in the Third Age. In several developed countries, this population is predominantly in good health, and there is pressure upon government leaders and organizations to find ways of making more effective use of the economic potential of groups of healthy older persons who have passed the age of 65. Moreover, as new cohorts enter the Third Age, this population will be increasingly better educated and well prepared to carry on vigorous activity in the economy and in civil society. They thus represent an enormous resource in such countries.

Measurement and Analysis of Population Aging

Measurement and analysis of population aging received a key stimulus from the formal modeling of *Alfred Lotka*, who developed a mathematical model of demographic changes and related aspects of population aging. His model enabled demographers to examine the long-term effects of different levels and age patterns of fertility and mortality on population aging when they are held constant over time in a closed population. Many articles on this topic now exist among the literature.

Lotka's model was later extended by relaxing the assumption of a closed population to include assumptions about the existence of certain age-specific rates of net migration. It has been shown that if an age-adjusted fertility rate and the schedules of age-specific mortality and migration rates were held constant for a long period, the population would assume a stable age structure even in the presence of the migration.

As regards analysis of the causes of population aging, for decades demographers have presented population aging as a byproduct of the demographic transition. In this transition, fertility decline follows an earlier mortality decline, thus promoting aging from the base of the age pyramid. A *declining birth rate* contributes to population aging by depressing the growth rate at the youngest ages, thus creating a faster growth rate among older persons than among youth.

Later on in the demographic transition, declines in mortality rates at the older ages contribute to "aging at the apex" of the *age pyramid*. Aging at the apex also develops when relatively large birth cohorts from the past (such as the baby boom generation) reach older ages. *Aging at the apex* has been particularly important in accounting for more recent increases in both the numbers and proportions of the elderly in developed countries.

In most national settings, net international migration has not been large enough to have a substantial impact on population aging (this may not apply to certain regions within countries that undergo large migratory movements). However, recent literature includes analyses of the extent to which migration might be a source of relief from pressures attributed to population aging (Meyerson, 2001). The pertinent analyses find that "replacement migration can only temporarily relieve population aging" (Meyerson, 2001).

As noted above, the move to bring the consideration of disability into discussions of population aging could eventually lead to a challenge to the traditional definition of population aging, relying as it does only on chronological age. One way to sense the importance of this development is to reflect that in this broadened approach to the meaning of "aging," one asks not only how many years a person has lived (or can be expected to live starting now) but what portions of those future years can be expected to be free of disability, especially severe disability (Robine & Michel, 2004). Thus a group with chronological average age of 70 could, in certain circumstances associated with their functional capacities, be effectively younger than another group with chronological average age at 55.

The potential consequences of this new line of thinking for the demography of aging include major revision of the estimated proportion of elderly in a population, since demographers would have to take into account the distribution of certain functional capacities. Also, analyses of the causes of demographic aging would have to be broadened to take into account factors that affect the retention of functional capacities in a population.

A most important development in recent decades has been the spread of demographic aging to a wide spectrum of countries around the world. Formerly, this phenomenon was thought to be an attribute of the more developed countries. This aging on the world scale will become a topic of major concern in the future demography of aging (Kinsella & Velkoff, 2001).

Changing Characteristics Among the Older Population

The continuing *aging of the population* produced by the momentum of growth from previous levels of high fertility, the fall in the birth rate since the early 1960s, and recent marked declines in mortality at older ages, has been accompanied by changes in the characteristics of the older population.

A notable aspect of these changes is the growing proportion of the older population that is aged 85 or more in developed countries (Perls, 2004). This trend will continue until the influx of large numbers of persons from the post-World War II baby-boom cohorts reach age 65 or more, beginning in the second decade of the 21st century. Then some 20 years later, the baby boomers will provide an enormous boost to the size of the population aged 85 or more.

Another important attribute of the older populations of most countries can be characterized as sex disparity. There is a much greater *number of older women* than older men, which results from differential mortality risks that favor women. Along a wide range of social and economic variables, gender disparity is a characteristic feature of the older population.

Conclusion

The demography of aging provides theoretical and methodological perspectives on various aspects of population aging. The field has been enriched not only by the contributions from general demography, but by recent developments arising from gerontological research issues and modeling work done by scholars concerned with economic issues. Especially notable among these developments is a new focus upon population aging in developing countries, proposals to broaden the concept of demographic aging to take into account functional capacity as well as chronological measurement of age, and research in *biodemography* that suggests future increases in human life span (maximum length of life). These developments are likely to lead to major revisions of existing statistical series about population aging and to new lines of analysis that explicitly deal with issues related to retention of functional capacity in the older population and to extension of the human life span.

Also notable is the priority accorded to aging-related issues in many countries' social and economic policy making. This is a result of the shared perception that population aging is or will soon generate major financing pressures upon national pension systems.

The aging of major sets of cohorts, such as those that comprise the baby boom generation, is gaining increased attention. With hindsight on the extent to which the baby boom generation has disrupted institutions and culture at each stage of its maturation, it is likely to upset expectations concerning attributes of the older population, since those expectations are based on the study of earlier cohorts.

LEROY O. STONE

REFERENCES

Gauthier, H., Jean, S., Langis, G., Nobert, Y., & Rochon, M. (2004). *Vie des générations et personnes âgées: aujourd'hui et demain*. Québec: Gouvernement du Québec.

Kinsella, K., & Velkoff, V. A. (2001). *An aging world.* Washington, DC: U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau.

Martin, L. G., & Preston, S. H. (Eds.). (1994). *Demography of aging*. Washington, DC: National Academies Press.

Meyerson, F. A. B. (2001). Replacement migration: A questionable tactic for delaying the inevitable effects of fertility transition. *Population and Environment*, *22*(4), 401–409.

Perls, T. T. (2004). The oldest old. *Scientific American*, *14*(3), 6–11.

Robine, J. M., & Michel, J. P. (2004). Looking forward to a general theory on population aging. *Journals of Gerontology*, *59*(6), 560–597.

Siegel, J. S. (1980). On the demography of aging. *Demography*, *17*, 345–364.

Stone, L. O. (Ed.). (1999). *Cohort flow and the consequences of population aging, an international analysis and review*. Ottawa: Minister of Industry.

Vaupel, J. (2000). Setting the stage: A generation of centenarians? *Washington Quarterly, 23*(3), 197–200.

DENTAL IMPLANTS

A dental implant is a hollow metal screw that is placed in the jawbone in the place of a missing tooth and allows the dentist to place in it or on it a tooth or an attachment for a denture. Although dentists had tried for several hundred years to put dental implants in the jaw, it was not until the 1950s when a Swedish orthopedic surgeon studying bone healing in rabbits serendipitously observed that the metal titanium bonded to bone.

Appropriate Candidates for Implants

A person should be ambulatory and in reasonable health, as well as having adequate bone in the area of the missing teeth. The reported success rate after 10 years is approximately 98% for implants placed in the anterior mandible (i.e., front of the lower jaw) and 89% for the anterior maxilla (i.e., front of the upper jaw). The success rate for implants in the back part of the upper and lower jaws is in the range of 85% to 95%. The difference is related to the quality and quantity of bone available. There is potential increased risk of failure in those who smoke, have an autoimmune disease (e.g., rheumatoid arthritis), or have had IV bisphosphonates, chemotherapy, or radiation to the jaw (Paquette, Brodala, & Williams, 2006).

Implant Failure

The most common reason for implant failure is lack of integration (i.e., bonding to the bone). Implants can have other forms of complications such as wear, loosening of the crowns or bridges and, rarely, fracture of the implant themselves. Failure to properly clean the implant and the soft tissue around it can result in infection and loss of supporting bone, very much like severe gum disease.

Determining Candidacy for Implants

A number of factors are considered before determining if an implant is an appropriate treatment and what type is best (Wood et al., 2004). Before any implants are placed, the dentist makes models of the patient's mouth and makes the appropriate x-rays to determine the size and shape of the implant needed. The x-rays and clinical examination also determine if bone grafting from another site will be necessary. The dentist uses models to make a surgical guide so that the implants are positioned in the best place for the replacement teeth. A general dentist with extra training in implant placement or a prosthodontist performs the diagnostic workup. In the absence of special training, a general dentist or prosthodontist will refer to a periodontist or an oral surgeon to surgically place the implants guided by the surgical guide made by the referring dentist. The implant is usually not restored for 6 weeks in the lower jaw and for up to 3 months in the upper jaw.

For those with no teeth left in the lower jaw who are wearing dentures, it is possible to retrofit two implants into the lower jaw and by a process of relining the existing dentures, adding attachments to the denture so that it clips onto the implants.

This does not work as easily on the toothless upper jaw. In this case, four to six implants must be placed and restored with a denture that connects to the implants. This can be through clips connecting to a bar that joins the implants. Alternatively, the denture may connect to the individual implants with plastic attachments.

The surgical placement of a dental implant is usually done under local anesthesia and is generally not very painful. Patients can expect some discomfort after the anesthesia wears off; most patients do not have significant problems with the aid of mild analgesics. Some patients do have varying degrees of pain or discomfort that may last for several days. Swelling and black and bluing of the skin around the mouth may also develop.

Choosing Between a Bridge and an Implant

Dentists are often asked whether to replace one or two missing teeth with a fixed ("permanent") bridge or dental implant. If a fixed bridge were to be used for a patient who is missing the lower left first molar, the dentist would cut down the adjacent teeth (i.e., the second molar and the second premolar) and fit a three-unit fixed bridge over those two teeth. The missing tooth would be called a pontic and it would be effectively replaced by the three-unit bridge. Alternatively, the dentist could place an implant in the site of the missing tooth (i.e., the first molar). The implant would take about 6 weeks to 3 months to bond with the bone and then, at that time, the dentist would construct a single crown on the implant to replace the missing first molar.

The cost of each one of these procedures varies among dental offices, but a three-unit fixed bridge costs about the same as an implant and a crown. The actual decision to do one over the other rests with the patient and the dentist. If the teeth on each side of the space are healthy, an implant is a very good treatment. If the teeth on each side of the space have large fillings that require further treatment, like crowns, then a fixed bridge is also good treatment.

RONALD L. ETTINGER
CLARK STANFORD

See also
Dentures
Geriatric Dentistry: Clinical Aspects
Oral Health Assessment
Xerostomia

Internet Resources
American Academy of Periodontology
http://www.perio.org/consumer/2m.htm

American Dental Association
http://www.ada.org/public/topics/implants.asp

The Dental Implant Source
http://www.dental-implants.com/faq.htm

REFERENCES

Paquette, D. W., Brodala, N., & Williams, R. C. (2006). Risk factors for endosseous dental implant failure. *Dental Clinics of North America*, *50*(3), 361–374, vi.

Wood, M. R., Vermilyea, S. G., & Committee on Research in Fixed Prosthodontics of the Academy of Fixed Prosthodontics (2004). A review of selected dental literature on evidence-based treatment planning for dental implants: Report of the Committee on Research in Fixed Prosthodontics of the Academy of Fixed Prosthodontics. *Journal of Prosthetic Dentistry*, *92*(5), 447–462.

DENTISTRY

See
Geriatric Dentistry: Clinical Aspects

DENTURES

In Western societies, teeth symbolize youth, potency, strength, and virility. Aging is associated with tooth loss. About 70% of people who have lost their teeth express regret and 60% consider dentures a handicap. Many studies report that 25% to 30% of complete denture wearers have problems with their dentures, especially the mandibular (i.e., lower) denture. In fact, a person may have a technically perfect denture but be unable to tolerate it (Ettinger & Jakobsen, 1997; Moltzer, van der Meulen, & Verheij, 1996; van Waas, 1990).

Most natural teeth are lost due to two chronic, infective diseases: caries (decay) and periodontal (gum) disease. In general, both these diseases are preventable if the oral cavity is kept clean by the regular removal of plaque.

Types of Dentures

Dentures are prosthetic replacements for natural teeth and can be divided into four groups:

1. complete-removable dentures
2. removable-partial dentures
3. fixed-partial dentures
4. fixed-detachable dentures

A complete denture replaces the chewing surface of all the teeth in an arch. It sits on the mucosa or may have some support from the remaining natural teeth, which have been cut down to 1.5 to 2 mm above the gingival margin. These tooth-supported prostheses are called overdentures. Alternatively, dentures can be supported by implants.

A removable-partial denture replaces some missing teeth in an arch and is held in place by metal clasps or by special attachments that fit into or onto some of the remaining teeth.

A fixed-partial denture, or bridge, replaces some missing teeth and is supported with a crown or cap on either side of the missing teeth. Bridges are usually cemented in place and are not removable.

A fixed-detachable denture is held in place by screws that go into either implants or natural teeth.

Wearing and Removing Dentures

Every removable prosthesis moves while it is in use and is potentially traumatic. The mouth needs 6 to 8 hours of rest from a denture each day. The best time to remove a denture is during sleep, when the production of saliva required for lubrication and retention is at its lowest and parafunctional movements such as clenching and grinding are at their highest. A patient being treated for a temporomandibular joint problem may be advised by the dentist not to remove the prosthesis during sleep.

Denture Hygiene and Care

A denture, like teeth, becomes covered with plaque and needs to be cleaned regularly—ideally, after meals. If a denture is maintained in the mouth continuously, commensal organisms can colonize the plaque. If the denture is not removed and adequately cleaned, organisms such as *Candida albicans* (a fungus) can proliferate and release toxins, resulting in a hypersensitivity reaction of the oral mucosa that looks like contact dermatitis (Berge, Silness, & Sorheim, 1987). Persons who are frail, have xerostomia (i.e., dry mouth), are immuno-compromised, or have had radiation therapy of the head and neck are at greater risk for candidiasis. Stafford, Arendorf, and Huggett (1986) showed that if dentures are removed at night and allowed to air dry, the organisms on the denture surface do not proliferate as quickly. However, the dentures need to be hydrated by soaking them in water for several minutes before they are put back in the mouth.

When teeth are extracted, the bone that was produced during eruption of the teeth—the residual bone—begins to resorb. The rate of resorption for the anterior maxilla has been measured at about 0.1 mm per year; for the mandible, the rate is four times greater (0.4 mm) (Tallgren, 1999). This resorption, plus normal wear, results in dentures having a finite life span. The average complete denture needs to be relined or replaced every 5 to 7 years. The life span of a partial denture varies, depending on the amount of tooth support it has. Fixed-partial dentures should last at least 10 years because they are usually made of metal, porcelain, or a combination of the two.

The abutment teeth (i.e., the teeth supporting the denture) for removable or fixed-partial dentures are at higher risk of plaque accumulation, which can result in root surface caries or periodontal disease. Therefore, both dentures and the natural teeth must be cleaned. Fluoride rinses may be helpful for at-risk patients. For fixed-partial dentures and implants, special interproximal brushes and superfloss must be used to clean under and around the bridge (pontic) portion of the prosthesis or the tissues will become inflamed. A daily mouth rinse with 0.12% chlorhexidine gluconate may be helpful for patients who have difficulty cleaning. Because many of these older adults have a dry mouth, it is less irritating if the chorhexidine rinse is free of alcohol (see Sunstar Butler, http://www.sunstarbutler.com/splash.asp).

The best way to clean dentures is to use a denture brush and, if the patient can afford it, a small ultrasonic cleaner. Toothpaste should not be used to clean dentures because it is too abrasive and will damage the surface of the dentures. A mild dishwashing detergent works well; commercial soaks are also helpful.

Denture-Induced Oral Disease

Oral lesions associated with the wearing of removable prostheses can be due to microbial colonization of dental plaque, traumatic irritation by the denture, or an allergic response to denture materials.

Microbial colonization of dental plaque

Plaque that is not removed can become colonized by *Streptococcus mutans* and lactobacilli, causing caries on the surface of the remaining teeth. The plaque can also be colonized by a wide variety of aerobic and anaerobic organisms, which can result in bone loss around the teeth, called periodontal disease. If *Candida albicans* colonizes the plaque, especially the palatal tissue surface, a denture stomatitis may result. Plaque accumulation is exacerbated by an elder's progressive loss of normal dexterity, poor eyesight, decrease in salivary flow associated with the use of drugs (e.g., anticholinergics), and diseases (e.g., diabetes, depression, Parkinson's disease) (Ettinger, 1999).

Traumatic irritation

Traumatic irritation can result in an ulcer due to the changing fit of a denture caused by tissue resorption over time. The ability of oral mucosa to resist this mechanical irritation can be diminished by diabetes, nutritional deficiencies, or xerostomia. Denture wearing can also result in irritation hyperplasia, a chronic inflammatory tissue reaction that leads to edema and tissue overgrowth.

If residual bone is overloaded or if the tissues over it are chronically inflamed, the bone will resorb and be replaced with fibrous tissue. This commonly occurs in edentulous areas in the anterior maxilla and in tuberosity regions, resulting in so-called flabby tissue, which decreases support for the denture.

Although the main risk factors for oral cancer are the use of tobacco products and alcoholic beverages, there is epidemiological evidence that age, inadequate diet, poor oral hygiene, fractured teeth, and wearing of dentures may be contributing risk factors to the 30,000 new cases diagnosed each year. Therefore, all persons older than age 45 should have their oral cavities evaluated at least yearly for any changes, such as white, red, or mixed lesions, which may be a sign of oral cancer.

Allergic responses

A small percentage of the population is allergic to the acrylic resins used in complete and partial dentures. A much larger population is allergic to the nickel used in some temporary crowns and in the cast framework of removable-partial dentures.

Patient Acceptance of Dentures

The older the patient, the more likely there will be difficulty wearing complete dentures. Most problems are associated with the mandibular (lower) arch (Ettinger, 1993). Laird and McLaughlin (1989) stated that although the technical aspects of denture fabrication are important, it is critical to evaluate the patient's motivation and adaptive ability to wear dentures. In other words, a dentist can make a technically correct denture, but the patient may not be able to wear it if the tissues are unable to tolerate it or the patient does not have the necessary neurological skills. Another significant factor in the patient's adaptive ability is effective verbal and nonverbal communication between the dentist and the patient.

Several studies have shown that systemic disease and multidrug regimens increase the number of visits required to fit dentures. However, some patients cannot accept complete dentures either physically or emotionally; for them, implant-supported dentures may be a solution.

Ronald L. Ettinger

See also
Dental Implants
Geriatric Dentistry: Clinical Aspects
Oral Health Assessment
Xerostomia

Internet Resources
American Academy of Periodontology
http://www.perio.org/consumer/2m.htm

American Dental Association
http://www.ada.org/public/topics/implants.asp

Sunstar Butler
http://www.sunstarbutler.com/splash.asp

REFERENCES

Berge, M., Silness, J., & Sorheim, E. (1987). Professional plaque control in the treatment of stomatitis prosthetica. *Gerodontics*, *3*, 113–116.

Ettinger, R. L. (1993). Managing and treating the atrophic mandible. *Journal of the American Dental Association*, *124*, 234–241.

Ettinger, R. L. (1999). Epidemiology of dental caries: A broad view. *Dental Clinics of North America*, *43*, 679–694.

Ettinger, R. L., & Jakobsen, J. R. (1997). A comparison of patient satisfaction with dentist's evaluation of overdenture therapy. *Community Dentistry & Oral Epidemiology*, *25*, 223–227.

Laird, W. R., & McLaughlin, E. A. (1989). Management and treatment planning for the elderly edentulous patient. *International Journal of Prosthodontics*, *2*, 347–351.

Moltzer, G., Van Der Meulen, M. J., & Verheij, H. (1996). Psychological characteristics of dissatisfied denture patients. *Community Dentistry & Oral Epidemiology*, *24*, 52–55.

Stafford, G. D., Arendorf, T., & Huggett, K. (1986). The effect of overnight drying and water immersion on dandicial colonization and properties of complete dentures. *Journal of Dentistry*, *14*, 52–56.

Tallgren, A. (1999). The continuing reduction of the residual alveolar ridges in complete denture wearers: A mixed longitudinal study covering 25 years. *Journal of Prosthetic Dentistry*, *27*, 120–132.

van Waas, M. A. J. (1990). Determinants of dissatisfaction with dentures: A multiple regression analysis. *Journal of Prosthetic Dentistry*, *64*, 569–572.

DEPRESSION IN DEMENTIA

Clinically significant depression in the elderly—demented and nondemented alike—is an eminently remediable condition. However, if untreated, depression may become refractory and chronic, result in a shortened life expectancy due to suicide and other mechanisms, or cause social dysfunction and disturbing behaviors. Medical morbidity, not suicide, appears to be related most strongly to increased mortality in depression (Olin, Katz, Meyers, Schneider, & Lebowitz, 2002).

Two competing stereotypes may delay recognition and treatment of depression in the elderly. The first is that the advent of any mental disorder in advanced age is an indication of an underlying dementing process; the second, that old age is characteristically a time of losses and reactive depression. The former stereotype suggests that depression in old age is inconsequential; the latter that depression is normal.

Clinical Features

Post (1992) describes depressive disorders common in old age. The sufferer may report or evince sadness, emptiness, and detachment; anxiety and panic states may occur with or without euphoria and excitement as an associated cyclic aspect of the affective state. Speech is slowed and diminished or repetitive and importuning if anxiety is a dominant symptom. Self-esteem decreases and the patient loses interest in usual activities. The patient may be convinced that he or she is wicked and has sinned or that his or her bodily contents are impaired and objectionable. In all but the mildest episodes, sleep, appetite, body weight, and other vital functions may be disordered. In the most severely psychotic depressives, delusions of physical ill health, poverty, guilt, and self-deprecation may be expressed. Bizarre hypochondriacal and nihilistic delusions and pseudohallucinations may occur. Some patients present as mute. In some cases, paranoid symptoms may be conjoined with an empty or hostile affect superficially resembling paraphrenia. Neurotic depressives retain insight into their depressive symptoms and frequently exhibit phobias; anxiety is often more obvious than the underlying depression. The anxiety may be communicated as a feeling of restlessness or fluttering in the abdomen. Depression in dementia is similar to Post's description of depressive disorder although symptoms may be less severe. Social isolation, withdrawal, and irritability are more frequently reported symptoms in cases of depression in dementia (Olin et al., 2002).

The clinical diagnosis of depression is made using diagnostic criteria that are set forth in the Diagnostic and Statistical Manual for Mental Disorders (*DSM-IV-TR*) (American Psychiatric Association, 2000). Although the criteria for major depression and its subtypes are clearly described in the *DSM-IV-TR*, the tool does not adequately describe the unique manifestation of depression that occurs within the course of dementia in older persons. Olin, Schneider, Katz, and colleagues (2002) have delineated provisional diagnostic criteria for depressive features that occur within the course of dementia and discuss several significant differences between these provisional diagnostic criteria and those for Major Depressive Episode found in *DSM-IV-TR*. For example, the provisional diagnostic criteria for depression in dementia require three or more symptoms (versus five or more for Major Depressive Episode) and do not require the presence of symptoms daily.

Currently, the diagnosis of Major Depressive Episode is made only if it can be established that an underlying organic disorder is not present and that the symptoms are not a normal reaction to the loss of a loved one (i.e., uncomplicated bereavement). Additionally, the diagnosis is not made if the disturbance is superimposed on schizophrenia, schizophreniform disorder, delusional disorder, or psychotic disorder or if the criteria for schizoaffective disorder are met. These criteria relate to the importance of ruling out other psychiatric and organic illnesses that may produce depressive symptoms. Nonetheless, coexisting organic and affective disorders, such as depression and dementia, are common, and the presence of an organic illness does not rule out depression.

Estimates of the frequency of depression and, more broadly, affective disorder depend in large part on the definition and criteria used for diagnosis and on the population under study. Prevalence ratios of major depression in cases of dementia have been estimated to be in the range of 25% to 30% in some studies; *subsyndromal depression* (i.e., clinically significant symptoms of depression that do not meet *DSM-IV-TR* criteria), which is common in cases of dementia, is particularly distressing in patients with these combined conditions (Sadavoy, Jarvik, Grossberg, & Meyers, 2004, p. 16).

Dementias are multisymptomatic disorders often accompanied by a variety of noncognitive behavioral symptoms, such as depression, delusions, hallucinations, agitation, and aggressive behaviors. Harper (2000) indicates that because people with dementia fall within different and changing levels of awareness (e.g., nearly comatose, confused on an intermittent basis, relatively oriented), different assessment techniques need to be used at different points in the disease process. Although he acknowledges that the best source of information about people's feelings or perceptions are self-reports in intact individuals, "when elders are unable to express their emotions verbally, inferences about how the person is feeling must be made on the basis of behaviors and body language" (p. 498).

Four major obstacles interfere with the assessment of depression in dementia: the overlap in clinical manifestations of depression and dementia, the inability of demented patients to provide accurate information about their moods and inner lives, the narrow range of depressive symptoms addressed by instruments designed for severely demented subjects, and the transient nature of depressive symptoms in cognitively impaired individuals.

High rates of concurrent depression and dementia have led to attempts to develop tools to measure depression in older people with reversible or irreversible dementia (Alexopoulos, Abrams, Young, & Shamoian, 1988; Toner, Teresi, Gurland, & Tirumalasetti, 1999). Most of these measures are useful primarily among mildly to moderately demented subjects who can communicate their basic needs. Some measures include informant reports of the presence of depressive symptoms, although studies have found this method to be less valid than direct assessment. Self-report scales of depression have been used with both demented and nondemented subjects but have a number of limitations that contraindicate their use with physically or mentally frail elderly, and particularly demented persons. Observation scales are limited by the fact that adequate validity and reliability estimates are not yet available, the instruments focus on a narrow range of observable depressive symptoms, and they often exclude items that can be assessed only through direct interaction with the patient.

In comparing various assessment instruments and measures of depression in demented patients, Harper (2000) suggests that instruments are needed to augment existing observational and informant methods for detecting depressive symptoms among severely, moderately, and mildly demented patients with impaired communication. A measure that uses direct-interview techniques and observation is needed for all levels of dementia. The combination of direct-interview techniques using standard questions about symptoms of depression with observations of affect, or "feeling tone," has shown promise in preliminary studies with older subjects who have moderate to severe communication deficits. It has been shown to be a reliable and valid measure of depression at all levels of dementia (Toner et al., 1999).

Difficult-to-assess populations such as the cognitively impaired need a multisource approach for valid assessment. An assessment methodology comprising observational, informant, and direct-assessment measures is recommended. The Cornell Scale for Depression in Dementia (Alexopoulos et al., 1988) is a useful clinical instrument with an informant focus. The Feeling Tone Questionnaire (FTQ) (Toner et al., 1999) augments these tools by combining an informant focus and clinical observation methods and by adding behaviorally anchored ratings of affect. It was specifically designed for use with communication-impaired demented patients, uses standardized questions with simple wording, and can be used by nonclinically trained staff. Finally, because the FTQ requires only 5 to 10 minutes to administer, it can be repeated on several occasions over a prescribed period to capture fluctuating aspects of mood disorder or to obtain an average estimate of depressive symptoms.

The FTQ also has been used as a tool to facilitate evidence-based Team Interdisciplinary Problem-Solving (TIPS) regarding the treatment of depression in dementia. Evidence-based TIPS expands the six steps of problem solving (Toner, Miller, & Gurland, 1994) and incorporates two additional steps related to evidence-based practices in the treatment of depression. The eight steps of evidence-based TIPS are the following: defining the problem, brainstorming solutions, reviewing the evidence base for solutions, choosing a solution, planning ways to implement the solution(s), carrying out the plan, evaluating the solution, and documenting the evidence for successful and unsuccessful solutions.

John A. Toner

See also
Dementia: Overview
Depression Measurement Instruments

Internet Resource
American Journal of Geriatric Psychiatry
http://ajgponline.org

REFERENCES

Alexopoulos, G. S., Abrams, R. C., Young, R. C. & Shamoian, C. A. (1988). Use of the Cornell Scale in non-demented patients. *Journal of the American Geriatrics Society*, *36*, 230–235.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th Ed., Text Revision). Washington, DC: American Psychiatric Press.

Harper, G. (2000). Assessing older adults who cannot communicate. In R. Kane & R. Kane (Eds.), *Assessing older persons: Measures, meaning and practical applications* (pp. 483–515). New York: Oxford University Press.

Olin, J. T., Katz, I., Meyers, B. Schneider, L., & Lebowitz, B. (2002). Provisional diagnostic criteria for depression of Alzheimer disease: Rationale and background. *American Journal of Geriatric Psychiatry*, *10*, 129–141.

Olin, J. T., Schneider, L. S., Katz, I. R., Meyers, B. S., Alexopoulos, G. S., Breitner, J. C., et al. (2002). Provisional diagnostic criteria for depression of Alzheimer disease. *American Journal of Geriatric Psychiatry*, *10*, 125–128.

Post, F. (1992). Affective illness. In T. Arie (Ed.), *Recent advances in psychogeriatrics*. London: Churchill Livingstone.

Sadavoy, J., Jarvik, L., Grossberg, G., & Meyers, B. (Eds.) (2004). *Comprehensive textbook of geriatric psychiatry* (3rd ed.). New York: W.W. Norton & Company.

Toner, J. A., Miller, P., & Gurland, B. J. (1994). Conceptual, theoretical, and practical approaches to the development of interdisciplinary teams: A transactional model. *Educational Gerontology*, *20*(1), 53–69.

Toner, J. A., Teresi, J. A., Gurland, B. J., & Tirumalasetti, F. (1999). The Feeling Tone Questionnaire: Reliability and validity of a direct patient assessment screening instrument for the detection of depressive symptoms in cases of dementia. *Journal of Clinical Geropsychology*, *5*, 63–78.

DEPRESSION MEASUREMENT INSTRUMENTS

Depression is a highly prevalent but underrecognized and undertreated mental health problem in community-dwelling, medically ill, and institutionalized older adults. Untreated depression may result in the onset of physical, cognitive, and social impairment, as well as delayed recovery from medical illness and surgery, increased health care use, and suicide. With prompt and appropriate treatment, depression is often reversible. Clinicians can reduce the negative effects of depression by early recognition, intervention, and referral. Although depression-measurement instruments are not a substitute for individualized assessment or diagnostic interview by a mental health professional, these instruments are useful screening tools in a variety of clinical settings, especially when baseline measurements can be compared with subsequent scores. These measures should not be the sole basis for a depression diagnosis. When a patient has a positive screen with one of these instruments, a clinical diagnostic interview should be scheduled to determine if the patient meets criteria for major depressive disorder and treatment indicated.

Self-Report Instruments

Geriatric Depression Scale

The Geriatric Depression Scale (GDS) (Yesavage et al., 1983) is a brief self-report questionnaire that has been widely tested and used extensively in community, acute, and long-term-care settings with a variety of older populations and seems to be the best available assessment approach. The patient is asked to respond yes or no to 30 questions about how he or she felt within the past week. A score of 0 to 10 is normal, 11 to 20 indicates mild depression, and 21 to 30 indicates severe depression. The GDS may be used with the healthy or the medically ill and with mildly to moderately cognitively impaired older adults. However, research to establish the lower limits of cognitive status for which the tool is reliable is limited. Kafonek et al. (1989) reported deterioration in the sensitivity of the scale from 75% in intact nursing-home residents to 25% in those with cognitive impairment. A more recent study examined the validity of the GDS (using a cutoff of 10) versus psychiatrists' diagnoses of depression and found that the scale was valid for residents with Mini-Mental Status Examination scores greater than14, but that the validity deteriorated for those with greater impairment.

Using a cut-off score of 11, the GDS has 92% sensitivity and 89% specificity when evaluated against diagnostic criteria for depression. The validity and reliability of the tool have been supported in clinical practice and research. The GDS has several advantages over other screening instruments for depression: short completion time, limited number of potentially confounding somatic symptoms, high positive correlation with other depression rating scales, easily comprehended binary response options, and validation in a wide variety of older populations. When patients cannot complete the questionnaire by hand, an interviewer can administer the GDS without changing its psychometric properties. The GDS contains few somatic items that may potentially confound symptoms due to medical illness (Yesavage et al., 1983). A shorter, 15-item version of the GDS has proved useful in clinical settings where brevity is important to enhance acceptability and patient cooperation and is now used more often than the original 30-item scale in clinical settings (Sheikh & Yesavage, 1986). A score of 6 or above indicates clinically significant depressive symptoms warranting attention. In general, the shorter version has not performed as well as the longer version in psychometric evaluation (Ingram, 1996). Recently, a five-item version of the GDS demonstrated good receiver operating characteristics across a full spectrum of older populations (Rinaldi et al., 2003). The five items are as follows:

1. Are you basically satisfied with your life?
2. Do you often get bored?
3. Do you often feel helpless?
4. Do you prefer to stay home rather than going out and doing new things?
5. Do you feel pretty worthless the way you are now?

Two out of five depressive symptoms ("no" to question 1 and "yes" to questions 2 through 5) suggests the diagnosis of depression.

A drawback of the GDS (both short and long versions) is that it does not include a question on suicidal thought or intent, and the patient must be asked specifically about this.

Although not specifically validated for use with the frail elderly population, a two-question screener is easily administered and is likely to identify patients at risk if both questions are answered affirmatively (Arroll, Khin, & Kearse, 2003). The questions are, "During the past month, have you been bothered by feeling down, depressed, or hopeless?" and "During the past month, have you been bothered by little interest or pleasure in doing things?"

Beck Depression Inventory

The Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a 21-item self-report scale used in primary care research and clinical practice with a variety of clinical and community samples of older adults. The Likert-type scale response may be confusing to older adults. Scores range from 0 to 64; a score of 10 indicates mild depression, 16 mild to moderate depression, 20 moderate to severe depression, and 30 or greater severe depression. A cut-off score of 16 is useful in primary care settings and carries a 50% chance of correctly identifying major depression. Of the 21 items, 7 (33%) are somatic features of depression that may be easily confused with symptoms caused by medical illness in older adults and may contribute to false-positive scores. A more recent version, the BDI-II, replaces items that dealt with symptoms of weight loss, changes in body image, and somatic preoccupation. Sleep and appetite items were revised to assess both increases and decreases in sleep and appetite. The new edition has better clinical sensitivity and higher reliability than the original BDI. An advantage of the BDI is that it can be used cross-culturally.

Center for Epidemiological Studies Depression Scale

The Center for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977) is a 20-item self-report scale with a Likert-type scoring format used extensively in epidemiological research with clinical and community samples of older adults. It has high internal consistency and reliability, acceptable test–retest stability, and good construct validity in these populations. Scores range from 0 to 60, with a cut-off score of 16 or greater distinguishing those with a high probability of major or clinical depression. The instrument has four subscales: general physical well-being, psychomotor retardation, depressed affect, and interpersonal functioning. Older patients may find the scoring format difficult to comprehend. When patients cannot complete the scale by hand, a clinician can administer the CES-D without major changes in sensitivity and specificity. The CES-D is reliable for use with African Americans.

Zung Self-Rating Depression Scale

The Zung Self-Rating Depression Scale (SDS) (Zung, 1965) is a 20-item scale widely used in depression research. Although it has been used with older adults, it has been validated primarily with younger patients. Scores range from 0 to 80; a score of 50 or greater is indicative of clinical or major depression, and a score of 20 or less indicates the absence of clinically significant depression. Somatic and behavioral items can account for up to 50% of the total score and may result in false-positive scores in patients with medical co-morbidities. Studies with acutely medically ill older adults found that an adjusted cut-off score of 60 yielded 87% specificity for clinical or major depression. The SDS can be completed in a short time, but the graded response format may be confusing for some older adults.

Interviewer-Administered Instruments

Hamilton Rating Scale for Depression

The Hamilton Rating Scale for Depression (HamD) (Hamilton, 1960) is the "gold standard" among outcome measures for treatment studies of depression in psychiatric, medical, and geriatric populations. It is most often used with patients already diagnosed as suffering from a depressive illness. The maximum possible score is 52, with a score of 30 or greater indicating severe depression. Somatic and behavioral items account for at least 50% of the scale. The scale requires clinicians to make medical judgments regarding the cause of depressive symptoms and places less emphasis on symptoms judged to be caused by medical illness. Despite concerns about the ambiguity of somatic symptoms in older adults, the HamD is reliable and valid with geriatric populations.

Cornell Scale for Depression in Dementia

The Cornell Scale for Depression in Dementia (CS) (Alexopoulos et al., 1988) is a 19-item clinician-administered scale developed specifically to measure depression in older adults with and without dementia. It is the only depression rating scale validated in both populations. The CS incorporates information derived from interviews with caregivers as well as direct observations and interviews with patients. The CS is administered in two steps, preferably by the same clinician. The clinician interviews the patient's caregiver (preferably one with knowledge of the patient over time) on each of the items and then briefly interviews the patient. Discrepancies between the clinician's observations and the caregiver's report warrant a reinterview with the caregiver to clarify the reason for the difference. The CS is then scored on the basis of the clinician's final judgment. The severity of each item is rated according to three explicitly defined grades: 0, 1 (mild), and 2 (severe), with a possible range of 0 to 38. The time frame used in the evaluation is the previous week to the previous month, depending on the items assessed. The higher the score, the greater is the severity of depression; a score of 13 or greater is indicative of major depression. An etiological approach to counting symptoms of depression is recommended, in that clinicians must judge whether symptoms are due to medical illness. CS items are scored positively or counted toward depression if they are not associated with medical illness.

Recommendations

The self-report GDS (short and long versions) appears to offer the best depression measurement for older adults. For those with mild to moderate dementia, self-ratings of depression using the GDS are reliable and valid. Of the interviewer-administered instruments, the HamD is the most well known but inter-rater reliability issues are of some concern. The number of somatic items on the HamD could contribute to false-positive scores in older adults with medical co-morbidities. The HamD appears to be most useful when measuring treatment outcomes in patients already diagnosed with a depressive illness. The CS is the only depression instrument validated in both nondemented and demented older adults and has reasonable reliability and validity, even in those with moderate to severe dementia. Further study of the CS is needed to achieve acceptable psychometric and diagnostic performance.

LENORE H. KURLOWICZ

See also

Cognition Instruments

Neuropsychological Assessment

Internet Resources

Depression and Bipolar Support Alliance
http://www.dbsalliance.org

National Foundation for Depressive Illness
http://www.depression.org

REFERENCES

Alexopoulos, G. S., Abrams, R. C., & Shamoian, C. A. (1988). Use of the Cornell Scale in non-demented patients. *Journal of the American Geriatrics Society*, *36*, 230–235.

Arroll, B., Khin, N., and Kerse, N. (2003). Screening for depression in primary care with two verbally asked questions: A cross-sectional study. *British Journal of Medicine*, *327*, 1144–1147.

Beck, A.T., Ward, C. H., Mendelson, M., Mock, J., Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561–571.

Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery, & Psychiatry*, *23*, 56–62.

Ingram, F. (1996). The short Geriatric Depression Scale: A comparison with the standard form in independent older adults. *Clinical Gerontologist*, *16*, 49–56.

Kafonek S, Ettinger WH, Roca R, Kittner S, Taylor N, German PS (1989). Instruments for screening for depression and dementia in a long-term care facility. *Journal of the American Geriatrics Society*, *37*, 29–34.

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Journal of Applied Psychological Measures*, *1*, 385–401.

Rinaldi, P., Mecocci, P., Benedetti, C., Ercolani, S., Bregnocchi, M., Menculini, G., et al. (2003). Validation of a five-item geriatric depression scale in elderly subjects in three different settings. *Journal of the American Geriatrics Society*, *51* (5), 694–700.

Sheikh, J. L., & Yesavage, J. A. (1986). Geriatric Depression Scale (GDS): Recent evidence and development of a shorter version. *Clinical Gerontologist*, *5*, 165–173.

Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., Leirer V. O. (1983) Development and validation of a geriatric depression screening scale: A preliminary report. *Journal of Psychiatric Research, 17,* 37–49.

Zung, W. (1965). A self-rating depression scale. *Archives of General Psychiatry*, *12*, 63–69.

DIABETES: MANAGEMENT

The clinical presentation and acute complications of diabetes include a variety of symptoms, most commonly polyuria, polydipsia, polyphagia, weight loss, and fatigue. In the elderly, however, these symptoms may be confused with normal age-related changes or symptoms of other medical disorders. Polyuria may be attributed to the use of diuretics or urinary incontinence. Weight loss may be associated with changes in appetite caused by medications and gastrointestinal disturbances. Whereas some individuals are asymptomatic and are diagnosed during routine medical examinations, others may have fully developed acute or chronic complications at the time of diagnosis—for example, when a patient presents in the emergency department with severe hyperglycemia or is having a diagnostic workup for pain and burning in the extremities. Thus, in the elderly, the diagnosis of diabetes must be considered in the workup for a variety of specific and nonspecific symptoms.

Management Goals

The two major goals in the management of diabetes, irrespective of age, are prevention of the acute metabolic derangements of diabetes and prevention of the chronic complications of diabetes. These goals are best achieved through a combination of therapies, such as diet, exercise, and medications, aimed at normalizing of blood glucose levels: fasting or preprandial, 90 to 130 mg; peak postprandial (1 to 2 hours after completion of meal), less than 180 mg; bedtime, 100 to 140 mg. Long-term glucose control is measured by the glycosylated hemoglobin level, which reflects average glucose readings over the previous 3 months. The recommendation for glucose control, as established by the American Diabetes Association (ADA), is a glycohemoglobin less than 7%, regardless of age (American Diabetes Association, 2006).

Treatment

Diet

Nutrition therapy—an essential element in the management of any patient with diabetes, regardless of age—includes maintenance of near-normal blood glucose levels, normalization of serum lipids, attainment and maintenance of a reasonable body weight, and promotion of overall health (American Diabetes Association, 2006). Dietary recommendations include the following: *caloric* intake sufficient to attain and maintain a reasonable body weight; *protein* intake 10% to 20% of total daily caloric intake; *fat* intake approximately 25% to 30% of total intake with saturated fat intake less than 7% of total fat calories; and *carbohydrate* intake calculated as the difference between protein and fat intake. Nutritive sweeteners, such as sorbitol, mannitol, and fructose, are considered carbohydrates. Noncaloric sweeteners, such as aspartame and saccharine, have been approved by the U.S. Food and Drug Administration (FDA) and are safe to consume. The nutritional guidelines of the American Diabetes Association (2006) stress individualization of the diet in accordance with blood glucose and lipid goals and emphasize the importance of weight loss.

Many elderly adults, however, may be undernourished due to a variety of physiological, psychological, social, and economic factors such as changes in smell, taste, and thirst; side effects of medications; inability to shop for food or prepare meals; cognitive impairment, depression, isolation, and loneliness; and inadequate income to purchase food (Gilden, 1999). For older adults who are unable to meet their nutritional needs through a regular meal plan (Holler & Pastors, 1997), it may be necessary to modify their usual food intake by changing the nutrient content or density, modify food consistency, use medical nutritional supplements, and consider enteral and parenteral nutritional support. Malnourished elders may require increased calories and upward adjustment of oral medications or insulin to maintain normal blood glucose levels.

Exercise

Routine exercise is an essential component of the treatment plan. It has been shown to enhance weight loss and improve glycemic control, insulin sensitivity, plasma lipids, quality of life, and psychological well-being in individuals with diabetes (American Diabetes Association, 2006). Adding an exercise program to the diabetes treatment plan may decrease the need for insulin or oral medications, but the benefits of exercise must be weighed against the risks and presence of complications in elderly adults with type 2 diabetes. Most older adults can undertake walking programs and should be encouraged to contact local senior citizen centers for physical activity programs. Adults with limited mobility or those confined to chairs can participate in arm or chair exercises. Older adults without significant complications can participate in jogging and swimming programs. Swimming, biking, and water aerobics may be most appropriate for individuals with neuropathy to avoid injury to the feet. Patients with retinopathy may need to avoid exercises such as jogging that may cause retinal bleeding.

Oral Medications

Oral diabetes medications are generally recommended when diet and exercise have failed to achieve optimal glucose control in patients with type 2 diabetes. With the current knowledge regarding the relationship between hyperglycemia and chronic complications, many patients are beginning oral diabetes medications at diagnosis, in combination with diet and exercise. There are currently five classes of oral diabetes medications available in the United States: sulfonylureas, meglitinides, biguanides, thiazolidinediones, and alpha-glucosidase inhibitors (Burant & American Diabetes Association, 2004). Individuals with type 1 diabetes are *not* candidates for oral medications.

Sulfonylureas stimulate insulin secretion from the pancreatic β-cell. The most frequent side effect of sulfonylureas is hypoglycemia (Burant & American Diabetes Association, 2004).

Meglitinides stimulate insulin secretion from the pancreatic β-cell more rapidly than sulfonylureas (Burant & American Diabetes Association, 2004). Meglitinides are taken before meals to reduce postprandial hyperglycemia.

Biguanides decrease hepatic gluconeogenesis and glycogenolysis and increase insulin sensitivity (Burant & American Diabetes Association, 2004). Gastrointestinal problems, including abdominal discomfort, are the most common side effects of metformin, the only biguanide currently available in the United States (Burant & American Diabetes Association, 2004). An infrequent side effect of metformin is lactic acidosis. Metformin is therefore contraindicated in any condition that causes hypoperfusion, such as severe hepatic, renal, and cardiopulmonary disease.

Thiazolidinediones increase insulin sensitivity (Burant & American Diabetes Association, 2004). Because the first thiazolidinedione (troglitazone) was associated with hepatic dysfunction, there are general guidelines for liver-function testing in patients using these drugs; however, due to the continued safety profile of these medications, the guidelines have been relaxed over the past 2 years. Recent research has cast some doubt on the cardiovascular side effects of rosglitazone (Lancet, 2007)

Alpha-glucosidase inhibitors interfere with the ability of enzymes in the small intestinal brush border to break down oligosaccharides and disaccharides into monosaccharides, thus retarding glucose entry into the systemic circulation (Burant & American Diabetes Association, 2004). Alpha-glucosidase enzyme inhibitors are associated with a number of gastrointestinal side effects, including bloating, abdominal discomfort, diarrhea, and flatulence. These side effects can usually be minimized by slow titration of the daily dosage.

Alpha-glucosidase inhibitors are contraindicated in individuals with inflammatory bowel disease, cirrhosis, or plasma creatinine greater than 2 mg/dL.

Insulin

Insulin is indicated as initial therapy in the following situations (DeFronzo, 1999): (1) patients who have type 2 diabetes, a markedly elevated fasting plasma glucose levels (greater than 280 to 300 mg/dL), and *ketonuria* or *ketonemia*; (2) symptomatic patients who have markedly elevated fasting plasma glucose levels (greater than 280 to 300 mg/dL) (these patients may remain on oral agents or be switched to oral agents after 6 to 8 weeks of good glycemic control); and (3) patients with type 2 diabetes who, after consultation with their health care providers, wish to receive insulin as initial therapy.

There are a number of insulin preparations currently available in the United States. Long- and intermediate-acting insulin preparations can be combined with short- and ultrashort-acting insulin preparations to provide sufficient daily insulin coverage for optimal glycemic control (Burant & American Diabetes Association, 2004). An example of such a combination is a split/mixed twice-a-day insulin regimen. In such a regimen, 70% of the daily insulin dose (approximately 0.5 to 1.0 unit/g/kg) is administered before breakfast and 30% is administered before dinner. The pre-breakfast and pre-dinner insulin doses are divided into 70% intermediate-acting and 30% short- and ultrashort-acting insulin. Another example is the use of a long-acting insulin preparation (e.g., insulin glargine) at bedtime with an ultrashort-acting insulin (e.g., insulin lispro) prior to each meal. The dose of rapid-acting insulin is based on the carbohydrate content of each meal.

There has been a variety of new products recently introduced for the treatment of type 2 diabetes. Byetta® (exenatide injection) is an injectable medication used as adjunctive mealtime therapy to improve glycemic control in patients with type 2 diabetes mellitus who are taking Metformin, sulfonylureas, or a combination of Metformin and sulfonylureas. This medication belongs to a class of medications called incretin mimetics. An incretin mimetic enhances glucose-dependent insulin secretion from the pancreatic β-cell. In addition, the incretins suppress elevated glucagon levels, promoting satiety, decreasing food intake, and slowing gastric emptying. Symlin® (pramlintide acetate injection) is a synthetic analog of human amylin, a hormone secreted by the pancreatic β-cell. Symlin is also injected at mealtimes and is indicated for improving glycemic control in type 2 diabetes. Symlin® can also be used as adjuvant mealtime therapy for the treatment of type 1 diabetes.

Patients and their family members must be taught to draw up and administer insulin correctly. The loss of fine motor skills and visual impairments associated with both diabetes and aging may necessitate the use of adaptive devices, such as magnifiers and insulin dose counters. A list of such devices is available from the National Federation of the Blind. Elderly patients may need the assistance of home health nurses and family members to draw and administer insulin. Premixed insulin preparations such as 70/30 (i.e., 70% intermediate insulin/30% regular insulin) and pen devices may be helpful.

Side Effects—Hypoglycemia

Biguanides, thiazolidinediones, and alpha-glucosidase enzyme inhibitors generally do not cause hypoglycemia when used alone. However, these medications may cause hypoglycemia when combined with sulfonylureas or insulin. The intensity of the insulin regimen must be balanced between glycemic control and the risk posed by hypoglycemia for a particular patient. For example, the risk of hip fracture from falling in an 80-year-old woman with severe osteoporosis may outweigh the benefits of excellent glucose control. In this case, blood glucose may be maintained at a slightly higher level. An elderly patient with diabetes is more vulnerable to hypoglycemia if he or she reduces overall caloric intake, skips meals, and exercises more intensely than usual. Hypoglycemia may be potentiated when gastrointestinal symptoms, such as those associated with alpha-glucosidase inhibitors and biguanides, are present.

If hypoglycemia occurs when alpha-glucosidase inhibitors and sulfonylureas or insulin are given simultaneously, glucose tablets or gels provide the fastest recovery from hypoglycemia. In elderly subjects, the symptoms of hypoglycemia can be confused with cognitive dysfunction. Therefore, patients and their families must understand how to prevent, recognize, and treat hypoglycemia.

Blood Glucose Monitoring

Self–blood glucose monitoring (SBGM) meters that measure capillary blood glucose levels provide immediate feedback, allow individuals to determine patterns of hyperglycemia and hypoglycemia, and facilitate appropriate decisions about insulin doses. Using SBGM may be a problem for elders with diminished visual acuity and fine motor skills. For these individuals, a meter that has easily readable results and requires the least technical skill is recommended. The most appropriate times to monitor blood glucose levels are before breakfast, lunch, dinner, and bedtime snack. These times should be modified, based on each individual's medication regimen.

Medicare and private insurance coverage for home glucose monitoring more than once a day may be unavailable. Clinicians should try to impress upon patients the importance of tight glucose control and work with patients with limited financial resources. Financial support for equipment and materials may be available from community programs or other resources.

LAURETTA QUINN

See also
Diabetes: Overview

Internet Resources
American Association of Diabetes Educators
http://www.aadenet.org

American Diabetes Association
http://www.diabetes.org

American Dietetic Association
http://www.eatright.org

National Center on Physical Activity and Disability
http://www.uic.edu/orgs/ncpad

National Diabetes Education Initiative
www.ndei.org

National Federation of the Blind
http://www.nfb.org/diabetes.htm

REFERENCES

American Diabetes Association (2006). Standards of medical care in diabetes–2006. *Diabetes Care*, *29* (Supplement 1) S4–S42.

Burant, C. F., & American Diabetes Association. (2004). *Medical management of type 2 diabetes (5th ed.).* Alexandria, VA: American Diabetes Association.

DeFronzo, R. A. (1999). Pharmacology therapy for type 2 diabetes mellitus. *Annals of Internal Medicine*, *131*(4), 281–303.

Gilden, J. L. (1999). Nutrition and the older diabetic. *Clinics in Geriatric Medicine*, *15*(2), 371–390.

Holler, H. H., & Pastors, J. G. (1997). *Diabetes medical nutrition therapy*. Alexandria, VA: American Diabetes Association.

The Lancet Rosiglitazone: Seeking a balanced perspective *The Lancet - Vol. 369, Issue 9576*, 02 June 2007 Page 1834

DIABETES: OVERVIEW

Diabetes mellitus, a major public health problem that affects approximately 20.8 million individuals in the United States, is increasing in epidemic proportions (American Diabetes Association, 2005). This epidemic of diabetes is not limited to the United States alone. The global prevalence of diabetes is expected to increase from 171 million in 2000 to 366 million in 2030 (Wild, Roglic, Green, Sicree, & King, 2004). Among those born in the United States in 2000, the lifetime probability of developing diabetes is 32.8% for males and 38.5% for females (Narayan, Boyle, Thompson, Sorensen, & Williamson, 2003). More than one-fifth, or 10.3 million, of the population 60 years and older has diabetes. Obesity, population growth, aging, urbanization, and physical inactivity are primary factors accounting for this epidemic.

Diabetes-Related Complications in the Elderly

The acute complications of diabetes include diabetic ketoacidosis (DKA), hyperosmolar hyperglycemic nonketotic syndrome (HHNS), and hypoglycemia. Chronic complications include retinopathy, neuropathy, nephropathy, and cardiovascular, cerebrovascular, and peripheral vascular disease. The interplay between these complications and age-related co-morbidities contributes to increased mortality in elderly patients with diabetes. The Diabetes Control and Complications Trial (DCCT) and the United Kingdom Prospective Diabetes Study (UKPDS) demonstrated that sustained hyperglycemia is associated with the development of chronic complications. In addition, the UKPDS demonstrated that the severity of type 2 diabetes increases with longer duration of the disease. Diabetes in the elderly is a clinically complex disorder and is no longer considered a "mild" disease. The maintenance of normoglycemia in elderly patients with diabetes not only ameliorates the side effects of hyperglycemia but also decreases the occurrence and progression of diabetes-related complications.

Classification of Diabetes and Other Forms of Glucose Intolerance

In 1997, the American Diabetes Association (ADA) introduced new diagnostic and classification criteria for diabetes and other forms of glucose intolerance: type 1 diabetes, type 2 diabetes, other specific types of diabetes, and gestational diabetes. Categories of glucose intolerance include impaired fasting glucose (IFG) and impaired glucose tolerance (IGT); IFG and IGT comprise a category called prediabetes (ADA, 2006).

Type 1 Diabetes

Although type 1 diabetes affects less than 10% of the elderly diabetic population (Harris et al., 1998), it is being diagnosed with greater frequency in adults. Evidence suggests that an increasing number of adults older than 35 years are developing slowly evolving type 1 diabetes, known as latent autoimmune diabetes in adults (LADA). The primary physiological defect in the development of type 1 diabetes is the destruction of the pancreatic β-cell, resulting in an absolute deficiency of insulin secretion. In most individuals with type 1 diabetes, this insulin deficiency results from an autoimmune destruction of the pancreatic β-cell. At the time of diagnosis, 90% to 95% of individuals with type 1 diabetes have circulating antibodies directed against the pancreatic β-cell. In a small number of patients, however, the cause of this pancreatic β-cell dysfunction is unknown. The inability of the pancreas to secrete insulin, regardless of the cause, results in classic symptoms of type 1 diabetes, including polyuria, polydipsia, weight loss, electrolyte imbalances, and diabetic ketoacidosis.

Type 2 Diabetes

Type 2 diabetes affects more than 90% of the elderly diabetic population and increases in prevalence with age-related alterations in insulin sensitivity and secretion, altered glucose metabolism, dietary changes, obesity, and decreased physical activity. Type 2 diabetes is characterized by decreased liver, muscle, and adipose sensitivity to insulin and a defect in pancreatic β-cell insulin secretion. The development of type 2 diabetes follows a typical course. There is an initial period of hyperinsulinemia in which the pancreatic β-cell is able to overcome resistance and maintain normal glucose tolerance. This is followed by a period of postprandial hyperglycemia and increased insulin resistance because hyperinsulinemia is insufficient to maintain normal postprandial glucose tolerance. In the final stage, fasting hyperglycemia is present due to increased insulin resistance, unrestrained hepatic glucose production, and the toxic effects of hyperglycemia on the β-cell. At this time, the patient usually develops clinical symptoms of type 2 diabetes ranging from polyuria to hyperglycemic nonketotic syndrome, a life-threatening state characterized by severe dehydration, increased serum osmolality, and hyperglycemia.

Other specific types of diabetes

Other specific types of diabetes affect less than 3% of the diabetic population. However, some of the secondary causes of diabetes in this category are more likely to occur in aging populations, such as pancreatic disease, hormonal disease, and medications that cause insulin resistance or decreased insulin secretion (e.g., glucocorticoids).

Pre-diabetes

IFG and IGT comprise the category of pre-diabetes and are terms used to describe individuals whose plasma glucose levels are higher than normal but are not diagnostic for diabetes. Nevertheless, this classification is a major risk factor for the development of both diabetes and cardiovascular disease. IFG is diagnosed as a fasting plasma glucose between 110 and 126 mg/dL. IGT is diagnosed as a 2-hour oral glucose tolerance test (OGTT) with plasma glucose between 140 and 200 mg/dL.

Risk Factors for the Development of Diabetes

Risk factors in the development of diabetes include ethnicity (i.e., Native Americans, Hispanics, African Americans, and Asian Americans), age older than 45 years, having a first-degree relative with diabetes, obesity, other medical disorders (e.g., hypertension, dyslipidemias), and history of glucose intolerance.

Complications

Diabetic ketoacidosis

DKA is a life-threatening condition in which severe abnormalities in protein, fat, and lipid metabolism occur as a result of an absolute or relative deficiency in insulin secretion. DKA usually occurs in patients with type 1 diabetes but may occur in patients with type 2 diabetes during times of severe stress, such as trauma, infection, myocardial infarction, or surgery. Mortality from DKA increases with advancing age. DKA is characterized by hyperglycemia due to increased glucose production and decreased glucose utilization, dehydration related to an osmotic diuresis, and metabolic acidosis related to increased production and decreased utilization of acetoacetic acid and 3-β-hydroxybutyric acid.

Hyperosmolar hyperglycemic nonketotic syndrome

HHNS usually presents in middle-aged to older individuals with type 2 diabetes or IGT in whom physiological stress results in increased hyperglycemia, severe dehydration, and increased serum osmolality. Elderly patients who cannot compensate for fluid losses induced by hyperosmolar hyperglycemia (e.g., stroke patients who cannot swallow or articulate their need for fluid) are particularly vulnerable to HHNS. Often the patient is unaware of any impairment in glucose tolerance. HHNS differs from DKA in that there is no metabolic acidosis caused by an accumulation of serum ketone bodies. Precipitating factors include medications that cause glucose intolerance, such as glucocorticoids; therapeutic procedures, such as peritoneal dialysis; chronic disease, such as renal failure; and acute situations, such as infection. HHNS is characterized by severe dehydration and serum hyperosmolality. Patients may exhibit neurological manifestations due to intercerebral dehydration and renal insufficiency or failure due to the profound dehydration and hyperosmolality. Mortality rates for HHNS range from 10% to 50% and are usually attributed to underlying causes of or precipitating factors for HHNS.

Hypoglycemia

Hypoglycemia is caused by an imbalance that occurs when glucose utilization exceeds glucose production. The low blood glucose level (usually less than 60 mg/dL) can cause a variety of adrenergic and neuroglycopenic symptoms. Precipitating factors in the development of hypoglycemia include excess exogenous insulin, excess oral hypoglycemic medications, and a decrease in food intake and increase in physical activity in patients using oral hypoglycemic medications. Several abnormalities in the counterregulatory feedback symptoms of type 1 diabetes can result in frequent hypoglycemia. In type 1 diabetes, glucagon secretion becomes deficient 2 to 5 years after diagnosis. With prolonged duration of the disease, the epinephrine response is also impaired due to subclinical autonomic neuropathy. Thus, patients with long-standing type 1 diabetes have difficulty both recognizing hypoglycemic symptoms and recovering from hypoglycemia. In elderly patients, the symptoms of hypoglycemia can be mistaken for changes in cognitive function or symptoms of coexisting diseases. Therefore, elderly patients with diabetes treated with insulin or oral sulfonylureas are at risk for increased morbidity and mortality from hypoglycemic episodes.

Chronic complications

The DCCT and UKPDS demonstrated that chronic hyperglycemia mediates the occurrence and progression of microvascular complications (retinopathy, neuropathy, and nephropathy) and is also a major contributor to the development of macrovascular complications (cardiovascular, cerebrovascular, and peripheral vascular disease). Although the exact physiological mechanism by which hyperglycemia mediates these complications are unclear, there are four general theories regarding their pathogenesis: the polyol pathway, the protein kinase C pathway, the glycosylation pathway, and the free-radical pathway (Brownlee, 2001). Regardless of the physiological cause, hyperglycemia is the primary contributor to the development of diabetes-related complications, but hypertension and lipid abnormalities are also major contributors to the development of macrovascular disease, in particular.

LAURETTA QUINN

See also

Diabetes: Management

Internet Resources

American Association of Diabetes Educators
http://www.aadenet.org

American Diabetes Association
http://www.diabetes.org

REFERENCES

American Diabetes Association. (2005). *National diabetes fact sheet*. Retrieved September 11, 2006, from http://www.diabetes.org/diabetes-statistics/national-diabetes-fact-sheet.jsp.

American Diabetes Association (2006). Standards of medical care in diabetes–2006. *Diabetes Care*, *29* (Supplement 1), S4–S42.

Brownlee, M. (2001). Biochemistry and molecular cell biology of diabetic complications. *Nature*, *414* (6865), 813–820.

Harris, M. I., Flegal, K. M., Cowie, C. C., Eberhardt, M. S., Goldstein, D. E., Little, R. R., et al. (1998). Prevalence of diabetes, impaired fasting glucose, and impaired glucose tolerance in U.S. adults. *Diabetes Care*, *21*(4), 518–524.

Narayan, K. M., Boyle, J. P., Thompson, T. J., Sorensen, S. W., & Williamson, D. F. (2003). Lifetime risk for diabetes mellitus in the United States. *Journal of the American Medical Association*, *290*(14), 1884–1890.

Wild, S., Roglic, G., Green, A., Sicree, R., & King, H. (2004). Global prevalence of diabetes: Estimates for the year 2000 and projections for 2030. *Diabetes Care*, *27*(5), 1047–1053.

DISCHARGE PLANNING

Every day, elders transition between health care settings, most often between hospitals and home. Discharge planning assists patients and their caregivers in these transitions while supporting continuity of care and achieving positive discharge outcomes. The complex decision-making process of discharge planning requires careful, comprehensive assessment to adequately determine patients' needs and coordinate follow-up services.

Discharge planning is a dynamic process used to identify patients' needs and develop plans of care following formal health care or transfer from one type of care setting to another. Most literature on discharge planning describes it as occurring during hospitalization, but it applies to any health care setting that requires care coordination at the next level. Several regulatory agencies, including the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and federal regulations, such as Medicare's Conditions of Participation and the Balanced Budget Act of 1997, mandate screening for needs following discharge.

Discharge planning usually consists of six steps: (1) screening for discharge planning needs, (2) assessing individual health needs, (3) deciding on the referral modality, (4) choosing vendors, (5) implementing the plan, and (6) evaluation (Pottoff, Kane, & Franco, 1997).

Screening for Needs

Patients older than age 65 account for 44.3% of all days of care in hospitals (Kozak, DeFrances, & Hall, 2006). Since the mid-1980s, the Medicare prospective payment system (PPS) and the increase in managed care have created incentives to shorten the length of hospital stays. Consequently, the average length of stay for those 65 and older has steadily decreased from 6.8 days in 1995 to 5.6 days in 2004 (Kozak, DeFrances, & Hall, 2006). With shorter stays, discharge plans occur with limited observational data, which is not ideal for such complex patients. Better decisions are made with higher quality information (Bowles, Naylor, & Foust, 2002). As hospitals adopt electronic patient record systems and invest in algorithmic decision-making programs, the discharge screening process will likely improve (Potthoff, Kane, & Franco, 1997). Meanwhile, health care providers need to be vigilant in identifying elderly patients' unique needs. Valid and reliable screening tools may help clinicians identify patients in need of specialized discharge-planning services. To empower patients and encourage participation, health care staff should fully discuss discharge plans with patients and their caregivers.

Assessing Needs

Assessing a patient's discharge needs requires multidisciplinary collaboration. To streamline and formalize this comprehensive assessment, the National Guideline Clearinghouse (NCG) published recommendations for Discharge Planning for the Older Adult. The guidelines recommend that assessments include functional, cognitive, and psychological status; patient's perception of self-care ability; physical and psychological capabilities of family/caregiver; knowledge deficits regarding health care needs postdischarge; environmental factors of postdischarge setting; caregiver formal and informal support needs; nine core caregiving processes; review and simplification of the medication regimen; and links to community services (http://www.guideline.gov/summary/summary.aspx?doc_id=3517&nbr=002743&string=discharge+AND+planningNGC, 2003). Upon completion of the assessment, the health care team can identify which modality is most appropriate and which type of vendor will best meet these needs.

Choosing a Care Modality

Identified needs must be paired with potential options. Posthospital referrals include transfer to a nursing home or rehabilitation center, skilled-nursing home-care visits, or discharge to informal family caregivers.

Caregivers should discuss each option and its implications with both patients and their families during planning. This is particularly challenging because there is no empirical evidence that compares posthospital options among similar patients. To complicate matters further, patients have differing values, and ethical dilemmas often arise when these values are not shared. Typically, elders' values and priorities focus on self-identity and relationships, family members emphasize care and security, and providers prioritize care and health (McCullough et al., 1993). Discharge planners must develop creative alternatives or strategies to accommodate both patient and families preferences while considering quality of care, policies regarding privacy and patient autonomy, flexibility, geographic convenience, cultural stigmas, and financial qualifications.

Choosing a Vendor

Medicare regulations require that all patients have a choice of vendors. The Medicare Web site helps patients and caregivers identify and compare home-health agencies and nursing homes according to geographical regions and/or services provided. In addition, this Web site provides information about quality measures such as changes in activities of daily living, mobility, percent of patients who remain at home, and other comparative data (http://www.medicare.gov/default.asp).

To properly support patients and caregivers, discharge planners must be familiar with the services offered by various vendors; their philosophy, location, costs, admission criteria, and policies; and quality of their care. Factors such as ownership, operational structure, insurance limitations, and financial incentives may influence the options. Nevertheless, the patient and family are the ultimate decision makers.

Implementing the Discharge Plan

The NCG offers general principles for implementation, which lists strategies to ensure continuity of care. These strategies are the four C's, which include communication, coordination, collaboration, and continual reassessment (NGC, 2003). Communication should be multidirectional and involve the multidisciplinary team, the patient, and family/caregiver, as well as the receiving vendor. An interdisciplinary record, including assessment findings and interventions, should accompany the patient to coordinate services and assist with continuity of care. An example of this type of record is in development (Medical Records Institute, 2006).

The two main challenges associated with implementing discharge plans are contacting appropriate personnel at the receiving agency and completing the paperwork requirements. Another challenge is the lack of feedback within the health care system to ensure that ordered discharge services were actually delivered and understood by the patient. Studies suggest that the elderly receive little information about their medications and condition, have difficulty managing special diets, and often do not understand activity recommendations and restrictions (Bull & Kane, 1996). Therefore, while discharged patients are receiving instructions for the management of medications, diet, and activity; care providers should consider (1) the quality of counseling given at the time of discharge, and (2) the level of patient comprehension. It is also strongly suggested that family be involved in medication counseling (Kerzman, Baron-Epel, and Toren, 2005). Involving the pharmacist may help to reconcile, streamline, and simplify the medication regime.

Evaluating the Discharge Plan

The goals of successful discharge planning include making appropriate discharge referrals, avoiding rehospitalization and adverse events, accurately communicating patients' needs, maintaining continuity of care, and achieving patient and caregiver satisfaction. Despite a long-standing need, there is still no uniformity for gathering and analyzing information on patients at set intervals postdischarge. Standardizing an evaluation of discharge plans can be as effortless as setting computerized alerts to prompt discharge planners to make follow-up calls or using information feedback systems to track patient outcomes. When properly executed, discharge planning occurs in a timely manner, after multidisciplinary input, with effective communication and collaboration between settings, entail routine evaluations, and result in high quality care with content patients and family members.

KATHRYN H. BOWLES
KIMBERLEE A. CLARK

See also
Transitional Care

Internet Resources
Administration on Aging
http://www.aoa.dhhs.gov

The National Center for Health Statistics
http://www.cdc.gov/nchs/data/ad/ad359.pdf

National Guidelines Clearinghouse
http://www.guideline.gov

2003 National Hospital Discharge Survey
http://www.cdc.gov/nchs/about/major/hdasd/listpubs.htm

U.S. Department of Health and Human Services
http://www.aspe.hhs.gov

The U.S. Department Office of the Assistant Secretary for Planning and Evaluation
http://www./aspe.hhs.gov/daltc

REFERENCES

Baker, E. B., & Wellman, N. S. (2005). Nutrition concerns in discharge planning of older adults: A need for multidisciplinary collaboration. *Journal of the American Dietetic Association*, *105*, 603–607.

Bowles, K. H., Naylor, M. D., & Foust, J. B. (2002). Patient characteristics at hospital discharge and a comparison of home care referral decisions. *Journal of the American Geriatrics Society*, *50*, 336–342.

Bull, M. J., & Kane, R. L. (1996). Gaps in discharge planning. *Journal of Applied Gerontology*, *15*, 486–500.

Kerzman, H., Baron-Epel, O., & Toren, O. (2005). What do discharged patients know about their medication? *Patient Education and Counseling*, *56*, 276–282.

Kozak L. J., DeFrances C. J., Hall M. J. (2006) National hospital discharge survey: 2004 annual summary with detailed diagnosis and procedure data. National Center for Health Statistics. *Vital Health Statistics, 13*(162).

McCullough L. B., Wilson N. L., Teasdale T. A., Kolpakchi A. L., Skelly J. R. (1993). Mapping personal, familial, and professional values in long-term care decisions. *The Gerontologist*, *33*(3), 324–332.

Medical Records Institute (2006). The continuity of care record. Available at http://www.medrecinst.com/pages/about.asp?id=54.

Potthoff, S. J., Kane, R. L., & Franco, S. J. (1997). Improving discharge planning for elderly patients. *Health Care Financing Review*, *19*(2), 47–73.

DIZZINESS

Dizziness is the fourth most common complaint of geriatric patients and the most common complaint of persons age 85 and older (Sloane, Blazer, & George, 1989). It accounts for more than 7 million clinic visits each year in the United States and has a prevalence of 13% to 38%. By age 65, 30% of people have had dizziness and by age 80 this increases to 66% of women and 33% of men. Dizziness has not been shown to predict mortality, hospitalization, or severe disability but is associated with an increased risk of falls, psychological distress, and diminished social activities.

The term *dizziness* applies to various subjective sensory experiences. Patients use this term to refer to lightheadedness, faintness, disequilibrium, vertigo, blurred vision, and giddiness. Therefore, the clinician must first determine what the patient means by the word. *The most useful part of the evaluation is the history.* The clinician should elicit the patient's own description of the event without prompting, determine character of symptoms (e.g., spinning, fainting, or falling) and any positional effects, and ask about associated complaints. Physical examination should include blood pressure and pulse (while supine and after standing for 1 to 2 minutes), cardiac exam, a check for nystagmus, and a thorough cerebellar and gait evaluation. The Dix–Hallpike and head thrust maneuvers are also important (Dix & Hallpike, 1952).

Types of Dizziness

Dizziness is classically divided into five types: (1) vertigo—a false sense of movement or spinning, usually due to problems in the vestibular system; (2) presyncope—a feeling of being about to faint, due to reduced blood flow to the brain; (3) imbalance—a sensation of unsteadiness in the lower extremities, usually due to neurological disease; (4) motion sickness—movement (e.g., amusement rides, automobiles, and airplanes), visual, or odor-induced (e.g., industrial pollutants); and (5) other—vague sensations often associated with anxiety or depression.

Determining whether dizziness is due to a central (e.g., brain tumor, cerebrovascular disease, multiple sclerosis) or peripheral (e.g., benign positional vertigo, labyrinthitis, Ménière's disease) cause is key. The sudden onset of dizziness in older persons generally has a single cause, such as an acute illness, new medication, or stroke. Chronic dizziness generally has multiple causes, although one factor is usually most important. Physicians should search for treatable causes and contributing factors, including anxiety or depression, decreased vision, and medication side effects.

Vertigo

Benign positional vertigo (BPV) is one of the most common causes of dizziness in elderly persons (Furman & Cass, 1999). Patients usually have a spinning sensation that accompanies changing the position of the head. The sensation is caused by small, dense, calcific particles (otoliths) from the saccule or utricle of the inner ear that break loose and migrate into the posterior semicircular canal. Once positioned in the canal or in its receptor, the particles amplify rotational movements in the plane of the canal. Thus, whenever the patient moves in the plane of the posterior semicircular canal, a short burst of intense vertigo occurs. With time, particles are either absorbed or scarred down and symptoms abate.

Clinically, BPV is characterized by episodes of intense vertigo lasting less than 1 minute (usually 5 to15 seconds). It is triggered by rolling over in bed, getting in and out of bed, and bending over and straightening up. Typically, patients have vertigo attacks with even slight rotatory movement. After the intense vertigo, a sensation of lightheadedness or mild vertigo can wax and wane for hours to days. Symptoms improve quite rapidly and typically resolve in days to weeks.

A simple clinical test, named the Dix–Hallpike or Barany maneuver, can help diagnose this condition. The patient is brought from a sitting to a supine position, with the head over the edge and tilted 30 degrees backward and turned 45 degrees to the side. This produces rotatory nystagmus (i.e., to-and-fro movement of the eyeballs) when the head is turned toward the affected side and reproduces the patient's vertigo. The symptoms often diminish with repeated testing.

Medication is generally not helpful for BPV, but physical exercises appear to help many patients and should be recommended. Determine the exact maneuver that most stimulates the vertigo and instruct the patient to repeat the maneuver several times a day. The exercises should be performed about every 3 hours, repeating them enough times during each session to fatigue the vertigo response (usually three to five repetitions). After being completely symptom free for several days, patients can stop the exercises (Herdman, 1990).

Labyrinthitis (i.e., inflammation of the inner ear; also known as vestibular neuronitis) is characterized by abrupt onset of severe vertigo and sparing of other neurological functions (Baloh, 2003). The most common cause is viral. Meclizine and promethazine may be helpful; low-dose benzodiazepines may provide some relief but must be used with caution. The condition usually occurs acutely, is self-limited, and typically begins to resolve in 24 to 36 hours.

Meniere's disease is a triad of recurrent vertigo, tinnitus, and hearing loss. At first, hearing loss is noted only during vertigo attacks; later, a fixed low-frequency loss can be demonstrated. Attacks of dizziness typically last between 2 and 12 hours. Often, patients complain of "fullness" or "pressure" within the ear but no pain. The frequency and severity of vertigo may improve as hearing impairment progressively worsens. Approximately 80% of patients respond favorably to medical management (e.g., low-salt diet, diuretics, meclizine). Surgical treatment is reserved for patients with severe symptoms who do not respond to medical management.

Presyncope

Presyncopal dizziness is distinctive and caused by diminished cerebral oxygenation. It leads to a feeling that one is about to pass out. Patients describe a need to sit or lie down, with darkening of the vision (both eyes) or simply as intense lightheadedness. Nausea and weakness often accompany the dizziness. Patients who actually lose consciousness are said to experience syncope. Some causes of presyncope and syncope are transient conditions that affect systems involved with postural control (e.g., cerebral cortex, brain stem/cerebellum, vestibular portion of inner ear/eighth nerve, proprioceptive pathways in the neck or lower extremities, peripheral nerves, skeletal muscle, autonomic nervous system). Also, abnormalities of the cardiovascular system (e.g., arrhythmias, myocardial infarction, aortic stenosis) as well as medical conditions including anemia, excessive diuresis, diabetes mellitus, and adrenal insufficiency are other causes.

Imbalance

Chronic dysequilibrium in older persons, especially in those age 85 and older, is commonly associated with either cervical spondylosis (i.e., neck arthritis) or cerebral ischemia/infarction, often involving small vessels. Persons with ischemic disease generally report a sudden or stepwise onset, have gait abnormalities on physical examination, and demonstrate subcortical white-matter lesions on magnetic resonance imaging (MRI) of the brain. Other factors that may contribute to imbalance include chronic vestibulopathies, visual problems, musculoskeletal disorders, and somatosensory or gait deficits.

Motion sickness

This is usually easily determined from the history.

Anxiety and depression

These are the most common causes of chronic, continual dizziness in younger populations. In older persons with chronic dizziness, psychiatric dysfunction is quite common as well but is rarely the primary cause. Treatment of these secondary psychiatric conditions, however, can reduce disability and improve function.

Many other conditions may cause chronic dizziness. Cerebellar atrophy, which may be idiopathic or secondary to degenerative conditions such as alcoholism, leads to a continuous feeling of dysequilibrium. Middle-ear disease or sinusitis can produce vertigo or more vague sensations of continual dizziness. Bilateral vestibular hypofunction is another cause (e.g., aminoglycoside toxicity). Other causes include sarcoidosis, carcinomatous meningitis, and syphilis. Brain tumors account for less than 1% of cases, the most common being an acoustic neuroma (i.e., tinnitus and hearing loss). In older adults, prescription-drug toxicity is an important contributing factor especially when taking five or more medications. High-risk drugs include any that cause orthostatic hypotension (e.g., cardiovascular, antihypertensive, psychotropic, and diuretic medications).

Diagnostic Testing

Diagnostic testing with audiometry may help if cochlear symptoms are present (e.g., tinnitus, asymmetric hearing loss) and abnormal results may indicate Ménière's disease or acoustic neuroma. Vestibular testing (e.g., electronystagmography, brain-stem auditory-evoked responses, rotatory chair, dynamic posturography) may be helpful. Laboratory tests with lower yield include complete blood count, electrolytes/glucose, creatinine, thyroid function, liver function tests and syphilis testing. Neuroimaging (i.e., CT, MRI) are occasionally needed, especially if there are focal findings on neurologic exam or if stroke is suspected. MRI is more sensitive than CT for evaluation of posterior fossa structures (e.g., brain stem, cerebellum). Magnetic resonance angiography of the posterior circulation will help assess vascular disease in elderly patients with risk factors. Electroencephalography is typically not useful and electrocardiogram is low yield with normal cardiac examination and no syncope.

Studies that are not useful for isolated dizziness include Holter and event monitors, echocardiography, stress-testing, tilt-table, and electrophysiologic studies.

Amiel Levin
Richard S. Isaacson

See also
Falls Prevention
Hearing Impairment

Internet Resources
Chicago Dizziness and Hearing
http://www.dizziness-and-balance.com/disorders

Coping with Dizziness
http://www.conciliocreative.com/dizzy

Medline Plus
http://www.nlm.nih.gov/medlineplus/dizzinessandvertigo.html

Vestibular Disorders Association
http://www.vestibular.org

REFERENCES

Baloh, R. W. (2003). Vestibular neuronitis. *New England Journal of Medicine*, *348*(11), 1027–1032.

Dix, M. R., & Hallpike, C. S., (1952). The pathology, symptomatology and diagnosis of certain common disorders of the vestibular system. *Proceedings of the Royal Society of Medicine*, *45*(6), 341–354.

Furman, J. M., & Cass, S. P. (1999). Benign Paroxysmal Positional Vertigo. *New England Journal of Medicine*, *341*(21), 1590–1596.

Herdman, S. J. (1990) Treatment of benign paroxysmal vertigo. *Physical Therapy*, *70*(6), 381–388.

Sloane, P., Blazer, D., & George, L. K., (1989) Dizziness in a community elderly population. *Journal of the American Geriatrics Society*, *37*(2), 101–108.

DRIVING

Among the driving population, older drivers are the fastest growing group in the United States and Canada (Dobbs & Carr, 2005). Because the majority of older adults prefer the use of a private automobile for mobility, they are driving more frequently and for a greater number of years. Consequently, older drivers, especially those older than age 75, are involved in a disproportionately high number of motor vehicle accidents; 75% of the crashes involve multiple vehicles and result in a higher fatality rate for the number of miles driven than for any other age group except teenagers (National Highway Transportation Safety Administration, 2003).

In recent years, the death rate due to crashes among older drivers has risen by 39% and is greater for men and people of color. The majority of deaths occur during the day (81%) and on weekdays (72%). Accidents not resulting in death usually involve injury and have increased by 19% in the last decade (Dobbs & Carr, 2005). The majority of them require hospitalization with an extended recovery period as compared to younger people. As the population continues to age, there will be a sizable increase in the number of older drivers, many of whom will be unsafe. It is projected that by 2020 more than 15% of older drivers will be 65 years of age or older, and by 2030 the number of traffic fatalities among elders will triple, making driving safety a priority for health professionals, policy makers, family members, and the public (National Highway Transportation Safety Administration, 2003).

Age alone is a poor predictor of motor vehicle accidents (Dobbs & Carr, 2005). It is more likely that older drivers are "medically at risk" due to conditions such as arthritis, cardiac disease, stroke, Parkinson's disease, diabetes, depression, sleep apnea, dementia, hearing loss, and/or visual impairment. Of these, diabetes has been shown to have the highest correlation to impaired driving ability.

Changes in posture, loss of coordination, reduced muscle strength, decreased joint flexibility, and the presence of foot abnormalities can adversely affect an older adult's driving competence (Carr, 2000). The ability to walk 1/2 mile, climb stairs, and engage in heavy housework is also highly associated with driving proficiency. Elders should be assessed for these changes and activities. Depending on the condition affecting their driving, referral to physical therapy may be useful in treating joint dysfunction and muscle atrophy, thereby increasing driving safety. An occupational therapist may recommend changes to the vehicle that will further enhance driving ability.

Although drinking and driving may occur less often in elders, the possible use and misuse of alcohol should not be discounted (Murden & Unroe, 2005). Certain prescription medications, such as antipsychotics, antihistamines, antidepressants, benzodiazepines, hypoglycemic agents, muscle relaxants, nonsteroidal anti-inflammatories, and opioids, used alone or in conjunction with alcohol, can further jeopardize the ability to make accurate and quick judgments necessary for safe driving (Carr, 2000). Some over-the-counter (OTC) medications will also impair driving ability.

Because vision is the key sensory function related to driving, older adults should be assessed for alterations in vision, such as narrowing of the visual field, decreased sensitivity to light, increased sensitivity to glare, and reduced night vision (Dobbs & Carr, 2005). The presence of cataracts, glaucoma, and macular degeneration should also be determined and treated.

It is important to identify cognitively impaired elders early because they are involved in more motor-vehicle accidents than unimpaired elders. Older adults should be carefully assessed for symptoms indicative of dementia, such as deficits in memory, attention span, judgment, language, orientation, and visual-spatial function. Scores on the Mini-Mental State Exam (MMSE) correlate highly with driving proficiency (Murden & Unroe, 2005). Those who obtain a score of less than 20 should stop driving. Health professionals and family members need to recognize that although many older adults believe that they are safe drivers, they alter their driving habits when their functional abilities decline (Ragland, Satarino, & MacLeod, 2004). Many avoid hazardous weather and heavy congestion, restrict their driving to daylight hours, and take fewer trips of shorter duration. However, these actions may not significantly reduce the older driver's accident risk.

Other older adults may self-screen for driver safety using several available tools, such as the Driving Decisions Workbook (Eby, Molnar, & Shope, 2000) and the American Automobile Association (AAA) Roadwise Review (AAA, 2005). Whether or not these tools are used, older drivers, especially women and those with higher income, may voluntarily stop driving for a number of reasons (Ragland, Satarino, & MacLeod, 2004). These include fear of having an accident, poor eyesight, fear of crime, and having no reason to drive. Those who have no reason to drive may live with a family member, have easy access to public transportation, or be within walking distance of needed services.

An on-road test using an open or closed course and conducted by an occupational therapist should be given when driving safety is a concern (Murden & Unroe, 2005). Although the effectiveness of driver retraining has not been well established, it is an option that can be suggested. Programs designed specifically for older adults focus on driving regulations, traffic signs, and risk reduction.

Health professionals should know whether state laws require them to report unsafe drivers to licensing authorities (Murden & Unroe, 2005). In states where reporting is not mandated, professional responsibility for the safety of older adults, other drivers, and pedestrians suggests the importance of voluntary reporting. A familiarity with driver-license renewal policies, which vary by state, is also essential.

Counseling unsafe older drivers to restrict their driving or to forfeit their licenses is an essential but often difficult task for health professionals (Ragland, Satarino, & MacLeod, 2004). It may be complicated by well-intentioned family members who have made subtle attempts to convince the older adult to stop driving. The health professional should acknowledge the role that driving has played in the individual's independence and self-esteem. Older adults need to be given the opportunity to discuss the impact that restricted or lost driving privileges may have on their lives. These include lack of access to essential services, such as shopping and health care; social isolation and loneliness; limited recreational opportunities; increased risk of falls due to the need to walk under potentially dangerous conditions, such as ice and snow; loss of income if still employed; and diminished quality of life. The possibility of early or forced entry into assisted-living or nursing-home facilities is also a reality that warrants discussion.

Although alternative forms of public transportation should be discussed, elders may find them inconvenient, expensive, inaccessible, or unreliable (Ragland, Satarino, & MacLeod, 2004). Efforts should be made to reduce isolation and help nondriving elders remain engaged in social activities. Friends, family members, and church groups can be queried about their willingness to assist with transportation, particularly when public transportation is unavailable. However, it is important to remember that although family and friends may promise assistance, such commitments are not always honored. Broken promises will add to the frustration and isolation already experienced by nondriving elders.

The events leading to a reduction in driving or the loss of a license and their consequences occur over time. They are not necessarily sequential, and not all older adults experience them. Because many individuals drive safely well into old age, health care providers should not assume that all elders are unsafe drivers.

JULIE E. JOHNSON

See also

Occupational Therapists

Physical Therapists

Internet Resources

Administration on Aging
http://www.aoa.dhhs.gov/research/drivers.html

Centers for Disease Control and Prevention
www.cdc.gov/ncipc/wisqars

Insurance Institute for Highway Safety
http://www.highwaysafety.org/safety_facts/older_people.htm

National Highway Traffic Safety Administration, Department of Transportation
http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2002oldfacts.pdf

REFERENCES

American Automobile Association (2005). *Roadwise Review*. Available at http://www.aaapublicaffairs.com/Main.asp?SectionID=&SubCategoryID=38&CategoryID=3&ContentID=315.

Carr, D. B. (2000). The older adult driver. *American Family Physician*, *61*(1), 141–146,148.

Dobbs, B. M., & Carr, D. (2005). Screening assessment of medically at-risk drivers. *Public Policy and Aging Report*, *15*(2), 6–12.

Eby, D. W., Molnar, J. L., & Shope, J. T. (2000). *Driving decisions workbook* (Report No. UMTRI-2000-14). Ann Arbor, MI: University of Michigan Transportation Research Institute.

Murden, R. A., & Unroe, K. (2005). A primary protocol to evaluate driving safety risk. *Geriatrics*, *60*(8), 20–24.

National Highway Traffic Safety Administration, Department of Transportation (2003). *Traffic safety facts 2002: Older population*. Washington, DC: NHTSA.

Ragland, D. R., Satarino, W. A., & MacLeod, K. E. (2004). Reasons given by older people for limitation or avoidance of driving. *The Gerontologist*, *44*(2), 237–244.

Stutts, J. C., & Wilkins, J. W. (2003). On-road driving evaluations: A potential tool for helping older adults drive safely longer. *Journal of Safety Research*, *34*, 431–439.

DYSPNEA (SHORTNESS OF BREATH)

Dyspnea originates from the Greek “dys,” meaning labored or difficult, and “pnoia,” meaning breath. The American Thoracic Society (1999) defines dyspnea as a “Subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity.” Although it is thought of as a single symptom, dyspnea is multifactorial, subsuming many sensations. It encompasses the discomfort of labored breathing and the individual’s reaction to it.

Prominence of Dyspnea in the Elderly

The work of breathing can increase by as much as 20% between the ages of 20 and 60. Similarly, the proportion of office visits for dyspnea rises with age (Karnani, Reisfield, & Wilson, 2005). The precise incidence of dyspnea is unknown, but it is a frequently reported symptom of pulmonary pathology, heart disease, neuromuscular disease affecting respiratory muscles, obesity, and anxiety. In the general population, dyspnea is one of the most common reasons for emergency-department (ED) visits. In the elderly, a visit to the ED for dyspnea is usually associated with an increase in the likelihood of hospital admission for one of two things: chronic obstructive pulmonary disease (COPD) exacerbation or congestive heart failure.

Elders with chronic cardiac or respiratory disease may have a blunted perception of dyspnea, possibly because of physiological adaptation over time. Some elders may have severe lung impairment yet perceive their dyspnea is not severe. This is the result of adapting over time (Lareau, Meek, Press, Anholm, & Roos, 1999). The reason for the subjective nature of the dyspnea is that this sensation is composed of several afferent sources from the brain stem and motor cortex, as well as from receptors in the upper airway, lungs, and chest wall. Also, situational context and behavioral influences contribute to the variation in reported severity and its unreliable correlation with pulse oximetry measurements.

Variations of Dyspnea

Dyspnea may occur at different times of the day or be associated with a position or phase of the respiratory cycle. *Difficulty inspiring* is associated with upper-airway obstruction, such as aspiration or epiglottitis. *Expiratory flow limitation* occurs with obstruction of smaller bronchioles, as in asthma. *Paroxysmal nocturnal dyspnea* (PND), usually associated with heart failure, is the sudden onset of difficult breathing and coughing when sleeping in the recumbent position. It occurs 1 to 2 hours after lying down and is relieved after assuming an upright position. *Orthopnea* is the inability to breathe lying down; to obtain relief, several pillows are usually needed to elevate the upper body. Orthopnea is very common in end-stage COPD but also occurs in other pulmonary diseases and left-sided heart failure. *Dyspnea on exertion* (DOE) is also very common in obstructive diseases, especially emphysema, and in restrictive diseases, specifically interstitial lung disease. An intermittent pattern of dyspnea suggests asthma or hyperventilation. Painful dyspnea suggests other causes, such as pleural or pulmonary inflammation, traumatized or inflamed intercostal muscles or thoracic cage, or even subdiaphragmatic inflammation, as seen in acute cholecystitis (Shepard & Geraci, 1999).

Evaluation of Dyspnea

A thorough interview to evaluate dyspnea severity is an important first step in assessment. Qualitative descriptions of chest discomfort help pinpoint the underlying etiology. Dyspneic persons often complain of difficulty moving air, inability to get enough air, chest tightness, poor exercise tolerance, aggravated breathing discomfort during social stress, and, in some cases, relief by using alcohol and sedatives. Mouth breathing, puffing, use of the accessory muscles of breathing, and inability to finish a sentence without pausing to breathe are frequent signs of true dyspnea from air hunger.

Asking the person about the amount of exertion that causes dyspnea can indicate its severity. However, some people adjust their physical activities in order not to experience dyspnea; hence, this type of inquiry may not be helpful. Severity of dyspnea on exertion can be gauged more objectively by distance covered and the pulse-oximetry results during a 6-minute walk test (6MWT) or the number of stairs completed in 2 minutes (2MST). There are also several scales that assess dyspnea. The visual analogue scale for elderly persons with COPD provides a quick and reliable measure of dyspnea. The Pulmonary Functional Status and Dyspnea Questionnaire (Lareau, Carrieri-Kohlmann, Janson-Bjerklie, & Roos, 1994) is another reliable scale that measures dyspnea intensity and changes in functional ability in elders.

Pulmonary-function tests (PFTs), exercise testing, and arterial-blood-gas sampling or pulse oximetry all provide information for differential diagnosis. Spirometry is essential in evaluating dyspnea because self-reporting of dyspnea does not always correlate with objective PFTs. A chest x-ray is not diagnostic but can provide information about heart size, lung parenchyma, pulmonary vasculature, pleural space, and diaphragm position. Wheezing usually indicates narrowing of the bronchi, as in asthma. Crackles indicate either areas of atelectasis from underventilation or mucus plugging or generalized pulmonary edema. Rhonchi may be heard in persons with increased sputum production. Inflammation in the pleura or pericardium may cause a friction rub.

Clinicians should also evaluate for nonpulmonary causes of dyspnea such as heart failure, anemia, fluid overload associated with renal failure, or severe anxiety disorders. Because cough and dyspnea can be the major or presenting symptom, a substantial time lag can exist before the correct diagnosis is made. Diagnostic tests aimed at confirming respiratory disorders do not provide clues to help in the diagnosing of these uncommon causes of dyspnea (Prakash, 2006).

New research has shown that a venipuncture finding of positive B-type natriuretic peptide (BNP) is related to cardiac ventricle pressure overload in patients with dyspnea, thus helping to differentiate CHF from a pulmonary cause of dyspnea (Belovicova, Kinova, & Hrusovsky, 2005). Another useful adjunct to the emergency assessment of the acutely breathless patient is to measure the difference between tympanic temperature and temperature at the tip of the nose. A gradient greater than 8° Celsius correlates to a cardiovascular cause whereas a gradient less than 5° Celsius rules it out (92% to 100% sensitivity) (Clarke, Parris, & Reynard, 2005).

Treatment of Dyspnea

One approach to the treatment of dyspnea is to help individuals self-regulate their breathing. Accurately assessing their perception of sensations and symptoms is an important component of biofeedback. Therefore, dyspnea rating scales such as the Borg Scale can be used not only to classify the severity of dyspnea for purposes of monitoring but also to desensitize high dyspnea responders (Mahler, Fierro-Carrion, & Baird, 2003). With repeated use of dyspnea scales, elders who panic and aggravate their condition can learn to control their responses more effectively. Any dyspnea lasting longer than 1 month is considered chronic dyspnea.

Dyspnea calls for an interdisciplinary approach. Nurses, physicians, respiratory therapists, social workers, and occupational and physical therapists can assist individuals by offering interventions and self-help strategies, including smoking cessation, pulmonary rehabilitation, avoidance of infection and environmental stressors, disease management, increased adherence, minimization of social isolation, and coping with uncertainty.

Extreme weather often worsens dyspnea. Hot and humid weather causes a higher concentration of airborne irritants and pollutants. Cold and dry air may contribute to bronchoconstriction. Covering the mouth with a scarf during cold weather can help minimize bronchospasm and related dyspnea. Remaining indoors may reduce breathing discomfort, especially on days of poor air quality from pollution.

Pulmonary rehabilitation improves functional capacity in chronically dyspneic lung patients 80 years of age or older (Baltzan, Kamel, Alter, Rotaple, & Wolkove, 2004). Pursed-lip breathing is a breathing retraining strategy some individuals must be taught, although others often adopt it naturally to reduce the severity of dyspnea. External resistance to expiration through pursed lips increases airway pressure and prevents airway collapse. Other techniques include moving at a slower pace with paced breathing, diaphragmatic breathing, use of an inspiratory-muscle training device, and relaxation to decrease anxiety. Upper-body movements such as hair combing are especially demanding, but elders can learn energy-conservation techniques through such programs as the Better Breathers Club offered by the American Lung Association.

Dyspnea can also be a sign of pulmonary infection. Elders have a decreased ability to fight infections. The clinical presentation of an elder in the face of infection is unusual with a diminished febrile response and lack of increase of white cells on the complete blood count (CBC). Lymphocytes and antibodies are not produced as well. Reduced mucociliary clearance and loss of effective cough diminish their pulmonary defense mechanism. Aspiration pneumonia is common due to dysphasia, impaired esophageal motility, and gastro-reflux disease. An age-related increase in reactivation of secondary tuberculosis has been found as well. A 90-year-old has half the pulmonary function of a 30-year-old. When lung infection occurs, dyspnea can be exacerbated by increased bronchial secretions. Teaching a person to cough productively can improve the clearance of pulmonary secretions. Taking a deep breath and huffing several times mobilizes secretions and induces a strong spontaneous cough. When necessary, aerosolized bronchodilators and nasotracheal suctioning may relieve dyspnea.

Symptomatic relief has been reported by directing a fan at the face or sitting before an open window. The air movement appears to stimulate facial receptors that alter the perception of breathlessness (Mahler et al., 2003). However, because many elders spend most of their time indoors, it is important to be aware of indoor pollutants that can trigger dyspnea, such as cooking fumes, wood fires, perfume, cleaning agents, dust mites, and dry air.

Obesity and the resulting increased intra-abdominal pressure on the diaphragm and lung can make a dyspneic episode worse. Added pounds increase the workload of the cardiopulmonary system. Diet modifications and graduated exercise are encouraged, keeping in mind age-related changes, financial status, cultural factors, and co-morbid conditions such as joint disease, dementia, and sensory problems. Exercise benefits dyspneic individuals, especially those with chronic respiratory diseases. Those who exercise show improved endurance and a subjective reduction in breathlessness.

Fatigue is often a major accompaniment of dyspnea. Elders and their caregivers need to pace periods of activity and rest. Paying attention to the location of elevators and restrooms and obtaining a handicapped parking permit are helpful ways to decrease fatigue as well as dyspnea.

Although attempts to modify the *perception* of dyspnea, such as aerosolized morphine, have failed, appropriate management of underlying cardiac, pulmonary, or neurological conditions can offer patients significant relief. Thus, adherence to the prescribed medication schedule is vital. In addition to oral and inhaled medications, low-flow oxygen can help to maintain acceptable arterial-oxygen saturation, especially for those with dyspnea on exertion. Some elders are reluctant to go out in public with portable oxygen and need encouragement to do so, as research has shown that continuous oxygen therapy (i.e., 24 hours/day and not as needed) successfully decreases the progression of right-heart failure.

Adequate treatment and reasonable control of dyspnea can improve the quality of life for elders who must deal with it as part of their everyday lives.

CHRISTINE FITZGERALD
ELIZABETH F. MCGANN

See also

Chronic Obstructive Pulmonary Disease
Heart Failure Management
Immunization
Medication Adherence
Social Isolation

Internet Resources

American Association for Respiratory Care
http://www.aarc.org

American Heart Association
http://americanheart.gov

American Lung Association
http://www.lungusa.org/

REFERENCES

American Thoracic Society (1999) http://www.thoracic.org/sections/publications/statements/pages/respiratory-disease-adults/dyspnea1-20.html

Baltzan MA, Kamel H, Alter A, Rotaple M, Wolkove N. (2004) Pulmonary rehabilitation improves functional capacity in patients 80 years of age or older. *Canadian Respiratory Journal, 11*(6):407–413.

Belovicova M, Kinova S, Hrusovsky S. (2005) Brain natriuretic peptide (BNP) in differential diagnosis of dyspnea. *Bratisl Lek Listy, 106*(6–7):203–206.

Clarke, S. F., Parris, R. J., & Reynard, K. (2005). Core-peripheral temperature gradient as a diagnostic test in dyspnea. *Journal of Emergency Medicine*, *22*, (9), 633–635.

Gift, A. (1989). Validation of a vertical visual analogue scale as a measure of clinical dyspnea. *Rehabilitation Nursing*, *14*, 323–325.

Karnani, N. G., Reisfield, G. M., & Wilson, G. R. (2005). Evaluation of chronic dyspnea. *American Family Physician*, *71*(8), 1529–1537.

Lareau, S., Carrieri-Kohlman, V., Janson-Bjerklie, S., & Roos, P. (1994). Development and testing of the pulmonary functional status and dyspnea questionnaire (PFSDQ). *Heart & Lung: Journal of Acute & Critical Care*, *23*, 242–250.

Lareau, S., Meek, P., Press, D., Anholm, J., & Roos, P. (1999). Dyspnea in patients with chronic obstructive pulmonary disease: Does dyspnea worsen longitudinally in the presence of declining lung function? *Heart & Lung: Journal of Acute & Critical Care*, *28*, 65–73.

Mahler, D. A., Fierro-Carrion, G., & Baird, J. C. (2003). Evaluation of dyspnea in the elderly. *Clinics Geriatric Medicine*, *19*(1), 19–33.

Parshall, M. (1999). Adult emergency visits for chronic cardiorespiratory disease: Does dyspnea matter? *Nursing Research*, *48*(2), 62–70.

Prakash U.B. (2006). Uncommon causes of cough: ACCP evidence-based clinical practice guidelines. *Chest, 129*(1 Suppl):206S-219S.

Shepherd, S., & Geraci, S. A. (1999). The differential diagnosis of dyspnea: A pathophysiologic approach. *Clinician Reviews*, *9*(4), 52–74.

DYSURIA

Dysuria is defined as painful urination and is caused mainly by inflammation. The pain is not felt over the suprapubic area but rather at the urethral meatus. Usually, pain is accompanied by urgency and frequency of urination and can have a major impact on quality of life (Koyama et al., 1998). Dysuria is a nonspecific symptom that can occur in different pathological conditions. Possible causes of dysuria include urinary tract infection (UTI), urolithiasis (distal ureteral lithiasis), urethral stricture, prostatic hyperplasia, carcinoma in situ of the bladder, interstitial cystitis, prostatitis, and bladder overactivity. There are no exact data on the incidence of dysuria in these conditions, but the symptom is usually present. Symptomatic treatment without evaluating the underlying disease may lead to postponed diagnosis of bladder cancer or other diseases, such as a sexually transmitted disease or interstitial cystitis.

A careful history should focus on hematuria, chronic UTI, use of indwelling catheters, urolithiasis, or urinary incontinence. Concurrent symptoms such as fevers and chills suggest an infectious cause. Painless hematuria may be caused by carcinoma in situ of the bladder or chronic infection. Dysuria might be the only symptom of chronic UTI in the elderly. In males, other irritative symptoms such as urgency, frequency, and nocturia, together with obstructive symptoms such as hesitancy, intermittency, and decreased urinary stream, may suggest benign prostatic hyperplasia. In females, these symptoms may suggest vaginal and vulvar atrophy with scarring of the external meatus due to menopausal changes.

Clinical examination should include a thorough examination of the external genitalia, a rectal examination in males to evaluate the prostate, and a vaginal examination in females. The minimal technical investigation should include urine microscopy, urine cytology, urine culture, and residual urine measurement; this will prove or rule out the presence of infection, hematuria, and voiding dysfunction. Because of the lack of specificity and sensitivity of urine cytology, a cystoscopic examination and possible biopsy might be indicated when carcinoma in situ has to be ruled out. Kidney and bladder ultrasound or x-ray will exclude or prove lithiasis. The presence of postvoid residual urine must be assessed because this can be a factor in recurrent infections. Abnormal urine cytology warrants cystoscopy, biopsy, and evaluation of the upper urinary tract (Bremnor & Sadovsky, 2002).

If no underlying disease can be detected, symptomatic therapy may be indicated. This can consist of increased diuresis, low-dose anticholinergics or antispasmodics, and pelvic floor rehabilitation. Empiric treatment of UTI can be considered in the case of suggestive symptoms and if microscopical or dipstick examination of the urine reveals leucocyturia of nitrates.

The treatment of dysuria is related to the cause (Rothberg & Wong, 2004). Low-potency estrogens given topically or orally are an effective treatment for urogenital symptoms in postmenopausal women (Milisom, 1996). If dysuria is persistent or if meatal scarring is present, urethral dilatation or urethrotomy may be indicated. In males, prostatic hyperplasia can be addressed medically or surgically.

Dirk De Ridder

See also

Benign Prostatic Hyperplasia
Urinary Tract Infections

Internet Resources

American Urological Association
http://www.urologyhealth.org

European Association of Urology
http://www.uroweb.org

National Institute of Diabetes & Digestive & Kidney Diseases (NIDDK)
http://www.niddk.nih.gov

REFERENCES

Bremnor, J. D., & Sadovsky, R. (2002) Evaluation of Dysuria in Adults. *American Family Physician*, *6*, 1589–97.

Koyama, W., Koyangi, A., Mihara, S., Kawazu, S., Uemura, T., Nakano, H., et al. (1998). Prevalence and conditions of urinary incontinence among the elderly. *Methods of Information in Medicine*, *37*(2), 151–155.

Milisom, I. (1996). Rational prescribing for postmenopausal urogenital complaints. *Drugs & Aging*, *9*(2), 78–86.

Rothberg, M. B., & Wong, J. B. (2004) All dysuria is local: A cost-effectiveness model for designing site-specific management algorithms. *Journal of General Internal Medicine*, *19*(5):433–443.

E

EATING AND FEEDING BEHAVIORS

Age does not affect the ability of older adults to ingest adequate amounts of nutrients. However, for some disabled older adults, the ability to ingest food may be hampered by the inability to transport food to the mouth, recognize food, perform the voluntary and involuntary stages of swallowing, or to remember to eat or stop eating (Amella, 2004). This special group of individuals needs assistance at meals or they will eat inadequate or inappropriate amounts of food, choke, and may experience premature mortality due to malnutrition. Therefore, when an older individual has an unplanned weight loss or gain, or a change in a nutritional health parameter, many health issues must be explored, including eating, feeding, and mealtime behaviors.

An older person with food-intake problems must be examined for visual problems (e.g., cannot see food or utensils); coordination problems due to neuromuscular conditions (e.g., cannot coordinate the act of bringing food to the mouth, cannot coordinate the voluntary phases of swallowing, or has impaired neurological pathways used to coordinate involuntary phases of swallowing); mechanical or obstruction problems (e.g., lacks the oral-pharyngeal structures needed to effectively perform the stages of swallowing, has barriers to the completion of successful ingestion, or has poor dentition); psychogenic problems (e.g., has depression or a condition with psychotic components, causing an unwillingness to eat or overeating); memory problems or dementia (e.g., does not recognize food, does not remember having eaten, does not recall how to use utensils, or forgets the voluntary components of swallowing, such as keeping the mouth closed, chewing food, forming a bolus, and moving food into the pharynx); and deconditioning (e.g., is frail and has loss of muscle mass [sarcopenia], producing severe fatigue that inhibits the ability to self-feed or produces an ineffective swallow). Thus, the act of taking in and ingesting food is a multifaceted process and when that process is impaired, it may require assessment and management by several health professionals: the primary care provider, dietician, nurse, dentist, speech pathologist, occupational therapist, and neurologist, as well as the direct caregiver and family.

Weight loss is a complex process that may be organic or nonorganic in origin. Chronic illnesses that predispose an older adult to weight loss include cancer and other wasting disorders such as end-stage heart and pulmonary disease, infection (especially AIDS), endocrine disorders, and organ failure. Oral health is a strong predictor of nutritional health. Older adults should receive preventive dental services as well as prompt treatment for all oral problems. Dysphagia, the inability to swallow food, is an important but frequently overlooked factor that causes unwillingness or inability to ingest foods. In older persons, disorders of the esophageal mobility are fairly common and require systematic investigation. In a study of 2,114 Finnish nursing-home residents, Suominen and colleagues (2005) used the Mini-Nutritional Assessment parameters to find that 29% were malnourished, with the following issues as greatest predictors: impaired functioning (OR 3.71), swallowing difficulties (OR 3.03), dementia (OR 2.06), constipation (OR 1.84), and eating less than half of the offered food portion (OR 3.03). Apraxias of speech and other motor movements affect persons with neurological impairment, especially stroke, supranuclear palsy, and several types of dementia, thus causing difficulty performing and sequencing complex gestures, such as manipulating items to self-feed and stating preferences (Kangas & Tate, 2006). Digoxin, benzodiapezines, opiates, serotonin reuptake inhibitors, laxatives, thyroxine, corticosteroids, chemotherapeutic agents, antihistamines, anticholinergics, and antibiotics are associated with anorexia, increased metabolism, or disturbed functioning of the gastrointestinal tract (Chau & Ratnaike, 2003) and thus may directly affect eating.

Cultural traditions or religious prescriptions regarding the healing qualities of food may result in food avoidance to keep from violating taboos or risking illness. With the growing diversity of ethnicity in the United States, health care professionals need to be aware of cultural preferences of older adults. For example, Hindus, Sikhs, and some Muslims practice Ayurvedic medicine, in which food may have healing or toxic qualities depending who eats them when. A complex and ancient science in which all living and nonliving matter is linked, such as humans and food, the gastrointestinal tract is seen as integral to health of all other systems (Chopra & Doiphode, 2002); thus, food ingested and eliminated must remain in a balance to achieve health.

The context and presentation of meals may have a powerful influence on the willingness to eat. Mechanically altered foods are sometimes unpalatable, and people placed on these diets are often relegated to eating them forever. However, these diets may be reversed if the individual receives swallowing rehabilitation or less dramatic diet modification. It may be possible to move a patient from tube feeding to oral feeding or from a puree diet to a mechanically soft diet, thus preserving the aesthetics of meals. The ability to focus on the process of eating may be hindered by an overly stimulating or distracting environment, such as a communal dining room or a room in the home where the TV is playing loudly. Caregivers unable to attend to the individualized needs of older persons due to understaffing, inadequate training, or lack of cultural sensitivity may resort to an approach that is not based on each person's tempo, food preferences, or needs.

Mealtime is more than a time to ingest food. In every culture, the sharing of food has ritualized social and even religious connotations. The relationship among people who share meals has profound significance, regardless of where the meal occurs. Thus, whether in a nursing-home dining room or the kitchen of a home, when one person helps another complete a meal, a fundamental social interaction occurs. The quality of that interaction may influence the meal and even the amount of food consumed. Attention must be paid not only to the perspective of the health professional but to those of the direct caregiver and the affected persons/patients themselves in order to determine strategies that are "ethical, socially inclusive and acknowledge the importance of food to well-being" (Manthorpe & Watson, 2003, p. 162). As long as mealtimes are medicalized, bereft of cultural and societal context and cues, persons are less likely to find in them the appealing life-long pastime that promotes exchange (Amella, 2004).

Failure to thrive (FTT), a syndrome marked by impaired physical function, malnutrition, depression, and cognitive impairment, must be considered in frail older adults (Robertson & Montagnini, 2004). FTT has contextual and interpersonal components that influence the individual's ability to eat or be fed. Two models have been suggested to address issues with FTT. Resnick (2001), using the Wheel of Motivation, addresses the issue of motivation as key to facilitating interest in eating and enabling other biopsychosocial factors that facilitate recovery from weight loss and stop the cycle of FTT. Newbern and Krowchuk (1994) suggest a model of a failed human–environmental interaction as part of a holistic approach to FTT. This model suggests that when assessing an individual with weight loss, the professional consider not only physiological components of wasting but also decline in cognitive function, signs of depression, an inability to give of oneself, and an inability to find meaning in life or attach to others. Both models address more than inadequate food intake and direct the professional to perform a comprehensive assessment that takes social, cultural, and psychological factors into consideration.

Elaine J. Amella

See also

Caloric Intake
Deconditioning Prevention
Dehydration

Meals on Wheels
Feeding: Non-Oral
Oral Health Assessment

Internet Resources

Best Practice: Geriatric Oral Health Training (University of Iowa)
http://www.medicine.uiowa.edu/igec/e_learning/dentistry/default.asp

Human Nutrition Research Center on Aging at Tufts
http://www.hnrc.tufts.edu/

MNA©: Mini-Nutritional Assessment
http://www.mna-elderly.com/

National Resource Center on Nutrition, Physical Activity and Aging (Florida International University)
http://nutritionandaging.fiu.edu/

REFERENCES

Amella, E. J. (2004). Feeding and hydration issues for older adults with dementia. *Nursing Clinics of North America*, *39*(3), 607–623.

Chau, L., & Ratnaike, R. N. (2003). Drug-associated nutritional problems in older persons. *Reviews in Clinical Gerontology*, *13*(3), 183–193.

Chopra, A., & Doiphode, V. V. (2002). Ayurvedic medicine. Core concept, therapeutic principles, and current relevance. *Medical Clinics of North America*, *86*(1), 75–89.

Kangas, M., & Tate, R. L. (2006). The significance of clumsy gestures in apraxia following a left hemisphere stroke. *Neuropsychological Rehabilitation*, *16*(1), 38–65.

Manthorpe, J., & Watson, R. (2003). Poorly served? Eating and dementia. *Journal of Advanced Nursing*, *41*(2), 162–169.

Newbern & Krowchuk (1994) Failure to thrive in elderly people: A conceptual analysis. Journal of Advanced Nursing, 19, 840–849.

Resnick, B. (2001). Weight loss and failure to thrive: Evaluating and motivating older adults toward recovery. *Annals of Long-Term Care*, *9*(7), 21–31.

Robertson, R. G., & Montagnini, M. (2004). Geriatric failure to thrive. *American Family Physician*, *70*(2), 343–350, 243–245.

Suominen, M., Muurinen, S., Routasalo, P., Soini, H., Suur-Uski, I., Peiponen, A., et al. (2005). Malnutrition and associated factors among aged residents in all nursing homes in Helsinki. *European Journal of Clinical Nutrition*, *59*(4), 578–583.

ELDER MISTREATMENT: OVERVIEW

The term *elder mistreatmen* describes a group of behaviors that cause harm or injury to older adults. Actions usually included in this category are abuse, neglect, and financial exploitation of those who are in a trusting relationship to an older adult (National Research Council, 2003). Many professionals also include self-neglect as a type of elder mistreatment. Elder mistreatment can take place in the home, referred to as domestic elder mistreatment, or in institutional settings such as hospitals, long-term-care facilities, assisted-living facilities, and nursing homes and referred to as institutional elder mistreatment (Fulmer & Paveza, 1998).

The exact number of older adults affected by elder mistreatment is unknown. The National Incidence Study on Elder Abuse (The National Center on Elder Abuse, 1998) suggests that almost 500,000 older adults are the victims of some type of elder mistreatment each year. Other studies suggest that the number may be closer to 2.5 million (Pillemer & Finkelhor, 1988), and even that number may be low when the various types of financial exploitation and mistreatment in institutional settings are taken into account (Paveza & Hughes-Harrison, 1997). Regardless of the actual number, it is clear that many vulnerable older adults are the victims of behaviors intended to hurt them physically, emotionally, or both.

The reporting of elder mistreatment is an important aspect of elder care in the United States. All 50 states have laws addressing this issue. In many states, doctors, nurses, social workers, other types of health care and home-care workers, and law-enforcement officers who suspect that an older person is being mistreated must report this to the appropriate state agency. For these persons, there is often a penalty for failing to report suspected abuse. Penalties range from loss of the right to practice professionally in that state to criminal prosecution, with a fine and/or imprisonment if convicted (National Research Council, 2003). In a few states, mandated reporting has been extended to all adults, meaning that any adult who suspects elder mistreatment is expected to report it to the responsible agency.

In many but not all states, the name of the person reporting the suspected mistreatment is confidential. In addition, all states have included a Good Samaritan clause in their legislation. This protects the person reporting the suspected mistreatment from a civil lawsuit should the investigating agency decide that no mistreatment has occurred, as long as the reporting person can show that there was no malicious intent.

Definitions of the types of elder mistreatment vary from state to state and across countries, but general concepts apply. *Elder abuse*, for example, is usually defined as deliberate behavior meant to cause physical pain and harm and usually includes such actions as hitting, punching, kicking, and biting, as well as threatening the person with a weapon or using a weapon. *Sexual abuse* of older adults involves unwanted sexual conduct and may occur in the older person's home or in institutional settings. *Elder neglect* is generally defined as failure to provide for the adequate care of an older adult in terms of housing, food, clothing, personal hygiene, medical care and medications, and other things needed to maintain health and well-being. Neglect can be divided into self-neglect, which occurs when older adults fail to provide these essentials for themselves; active neglect, when caregivers deliberately withhold food, clothing, money, and so forth; and passive neglect, when caregivers do not deliberately withhold necessities but may be unaware of what is needed. *Emotional abuse* is generally described as any physical or verbal action with the deliberate intention of causing emotional, psychological, or mental pain or distress. *Financial exploitation* is the willful obtaining of an older person's money or assets by someone with no legal right to that money for his or her own use or benefit. This can include fraud, embezzlement, or undue influence (National Research Council, 2003).

The individuals protected by elder mistreatment legislation vary across the country. In some states, the only requirement for protection under the law is achievement of a certain age, often 60 or 65. In other states, the person must be a certain age and also must be considered "vulnerable"—meaning that the person has some physical, cognitive, or mental impairment. Other states use a combination of these two concepts. The legal restrictions can sometimes frustrate attempts to report suspected elder mistreatment because, in the judgment of the investigator, the alleged victim may not meet the requirements for being a vulnerable adult.

The locations where elder mistreatment occurs are as varied as the places where older adults live. Much of the early work on elder mistreatment focused on those who were mistreated in the community and lived independently or with family. This focus was and is appropriate, because most older adults, healthy or frail, live in the community. Interest in elder mistreatment in institutional settings has increased with the realization that older adults residing in these facilities are among the most vulnerable. For those in caring roles, it is important to recognize that statements of fear or concern about being taken advantage of may be more than a paranoid or delusional response; they may be indications that the older adult is being mistreated.

Providing a general profile of mistreaters is difficult and somewhat less accurate than previously thought. With that caution in mind, it is still possible to make some general comments about persons who are likely to mistreat older adults. Men are more likely than women to engage in elder mistreatment when all forms of mistreatment are taken into account (Reis & Nahmiash, 1997). Some data indicate that mistreaters often have problems with substance abuse or other emotional or psychological problems that contribute to their propensity to mistreat older adults (Paveza & Hughes-Harrison, 1997). The age of the person who commits the mistreatment varies, depending on the relationship between the person who is mistreated and the mistreater. In the case of spouses, the age difference may be only a year or 2; with other family members, friends, or strangers, the age span may be 10 or more years. Mistreatment can occur between spouses, adult children and parents, grandchildren and grandparents, other relatives, friends, and complete strangers (Fulmer et al., 2004; Fulmer et al., 2005; Paveza & Hughes-Harrison, 1997; The National Center on Elder Abuse, 1998).

Similarly, a profile of the mistreated older adult is difficult to provide and varies with the type of elder mistreatment. Some general trends do emerge, however. Women are more likely to be mistreated than men, and the age of mistreated persons may range from the early 60s to well into the 80s, although the age range is somewhat higher for institutional abuse (Fulmer et al., 2005; The National Center on Elder Abuse, 1998). Finally, much of the research suggests that the person who is mistreated may have some physical frailty that makes him or her vulnerable (The National Center on Elder Abuse, 1998).

Although an understanding of who is mistreated and who mistreats is useful, in the end, what matters most is what we can do about it and how we can help those who have been mistreated. Intervention programs generally focus on providing both the mistreated and the mistreater with medical and social services. However, recent discussions have recommended that intervention take the form of law-enforcement involvement and criminal prosecution, suggesting that this may be the only way to protect vulnerable older adults. The most critical intervention that individual caregivers or older adults can engage in is making that initial report of suspected mistreatment.

Gregory J. Paveza

See also

Adult Protective Services
Crime Victimization
Elder Neglect
Financial Abuse
Institutional Mistreatment: Abuse and Neglect
Money Management
Self-Neglect

Internet Resources

National Adult Protective Services Association (NAPSA)
http://www.apsnetwork.org

National Aging Information Center
http://www.aoa.dhhs.gov/naic

National Center on Elder Abuse
http://www.elderabusecenter.org

National Committee for the Prevention of Elder Abuse
http://www.preventelderabuse.org

REFERENCES

Fulmer, T., Guadagno, L., Paveza, G. J., VandeWeerd, C., Baglioni, J., Anthony, J., et al. (2004). Profiles of older adults who screen positive for neglect during an emergency department visit. *Journal of Elder Abuse and Neglect*, *14*(1), 49–60.

Fulmer, T., & Paveza, G. (1998). Neglect in the elderly patient. *Nursing Clinics of North America*, *33*(3), 457–466.

Fulmer, T., Paveza, G., VandeWeerd, C., Guadagno, L., Fairchild, S., Norman, R., et al. (2005). Neglect assessment in urban emergency departments and confirmation by an expert clinical team. *Journals of Gerontology: Medical Sciences*, *60A*(8), 1002–1006.

National Research Council (2003). *Elder mistreatment: Abuse, neglect and exploitation in an aging America. Washington, DC*: The National Academies Press.

Paveza, G. J., & Hughes-Harrison, V. (1997). Financial exploitation of the elderly: A descriptive study of victims and abusers in an urban area. *The Gerontologist*, *37* (Special Issue I), 101.

Pillemer, K., & Finkelhor, D. (1988). The prevalence of elder abuse: A random sample survey. *The Gerontologist*, *28*, 51–57.

Reis, M., & Nahmiash, D. (1997). Abuse of seniors: Personality, stress and other indicators. *Journal of Mental Health and Aging*, *3*(3), 337–356.

The National Center on Elder Abuse (1998). *The National Elder Abuse Incidence Study* (Final Report). Washington, DC: The Administration on Aging (DHHS).

ELDER NEGLECT

Neglect is considered the most common form of elder mistreatment substantiated by Adult Protective Services (APS), and data demonstrate that underreporting may be as serious as five times the number reported (National Center on Elder Abuse, 1998). In 2003, the National Research Council published *Elder Mistreatment: Abuse, Neglect, and*

Exploitation in an Aging America, in which it defined neglect as "an omission by responsible caregivers that constitutes 'neglect' under applicable federal law" (National Research Council, 2003). Another definition of neglect is "the failure to provide the goods or services necessary for functioning or to avoid harm" (Dyer, Connolly, & McFeeley, 2003). A commonly utilized and accepted definition is essential for case reporting and determining prevalence (Lachs & Pillemer, 2004). Although neglect is the most common form of elder mistreatment, it is the most underreported and least understood (Fulmer et al., 2005). Because of the lack of understanding of what causes neglect and what the symptoms are, various legal standards are used in each state to determine elder neglect. In some states, such as Massachusetts, an instance of neglect must transpire at the hands of another; in others, such as Connecticut, self-neglect is a reportable subcategory of elder neglect.

Neglect can be psychological or physical and intentional or unintentional. Psychological neglect is the failure to provide dependent elderly individuals with social stimulation, whereas physical neglect is the failure to provide the goods and services necessary for optimal functioning. Forms of psychological abuse include verbal harassment or intimidation, threats, treating the older adult person like an infant (i.e., infantalization), and isolating the older adult from family, friends, or activities. Forms of physical neglect include withholding food, water, appropriate amenities for weather extremes, or health care; failing to provide eyeglasses, hearing aids, dentures, or other physical aids; and failing to provide safety precautions (Aravanis et al., 1993). Physical neglect is often easier to identify than psychological neglect; however, both forms are difficult to diagnose and may be misdiagnosed.

An additional form of neglect, self-neglect, is increasingly becoming a clinical and social problem. Self-neglect is difficult to diagnose because clinicians rarely enter the home setting and, if diagnosed, is difficult to intervene upon and treat. Self-neglect can be caused by a multitude of factors, including those common in other forms of neglect (discussed herein) and in elders with depression, cognitive impairment, and co-morbid health conditions (Abrams, Lachs, McAvay, Keohane, & Bruce, 2002). Self-neglect can cause worsening of chronic disease, creation of new possibly life-threatening conditions (e.g., hip fracture), and can even cause hazards for others (e.g., hoarding and cluttering behaviors).

TABLE E.1 Indicators of Elder Neglect

Inadequate/inappropriate clothing
Poor hygiene
Poor nutrition
Poor skin integrity
Contractures
Pressure ulcers
Dehydration
Impaction
Malnutrition
Urine burns/excoriation
Duplication of similar medications
Unusual doses of medications
Dehydration > 15%
Failure of caregiver to respond to warning of obvious disease
Repetition of admissions due to probable failure of health care surveillance

Certain risk factors significantly increase the occurrence of neglect. Studies have found that age is a major factor in elder neglect. Persons older than 75 years of age have a significantly increased chance of becoming neglected and, as the age of the patient increases, the chance of neglect becomes even greater (Lachs, Williams, O'Brien, Hurst, & Horwitz, 1997). In addition, minorities and elders with small social networks have an increased chance of becoming neglected (Lachs & Pillemer, 2004).

When examining older adult patients, health care professionals should assess for neglect (Fulmer, Guadagno, Dyer, & Connolly, 2004; Fulmer et al., 2005). The accompanying table presents indicators of neglect that can be found during the physical examination. Although clinical assessment scales are available, misdiagnosis and underreporting are still quite high. Both ageism, which creates stereotypical prejudices, and cognitive impairment impair self-report, contributing to underreporting and misdiagnosis.

Elder neglect, although often thought of as being associated with nursing homes, is just as prevalent in the community setting. Neglect occurring in the community can stem from self-neglect, caregiver neglect, or family neglect. In a study of 2,812 community-dwelling older adults followed during a 9-year period, the most common perpetrators of elder mistreatment were the adult children of the older adult (45%), followed by spouses (26%) (Lachs et al., 1997).

Intervention in cases in which neglect is suspected must be handled carefully. The first step is to obtain a thorough history and a physical examination, away from the caregiver or suspected abuser, because the patient may be intimidated and not respond directly to questions. If neglect is still suspected or has been substantiated, the state's APS department should be notified. An interdisciplinary team consisting of nurses, geriatricians, social workers, case managers, and representatives from legal, financial, and adult protective services can be very effective in critical thinking to manage these challenges.

Overall, neglect of elders is a serious and prevalent form of elder mistreatment that can occur in any setting. Risk factors and indicators must be closely watched by clinicians and other caregivers, and intervention must be performed expediently to avoid further suffering.

Terry T. Fulmer
Kristin Lemko
Gregory J. Paveza
Abraham A. Brody

See also

Adult Protective Services
Elder Mistreatment: Overview
Financial Abuse
Institutional Mistreatment: Abuse and Neglect
Self-Neglect

Internet Resources

International Network for the Prevention of Elder Abuse
www.inpea.net

National Adult Protective Services Association
http://www.apsnetwork.org

National Center on Elder Abuse
http://www.gwjapan.com/NCEA

REFERENCES

Abrams, R. C., Lachs, M., McAvay, G., Keohane, D. J., & Bruce, M. L. (2002). Predictors of self-neglect in community-dwelling elders. *American Journal of Psychiatry*, *159*(10), 1724–1730.

Aravanis, S. C., Adelman, R. D., Breckman, R., Fulmer, T., Holder, E., Lachs, M. S., et al. (1993). Diagnostic and treatment guidelines on elder abuse and neglect. *Archives of Family Medicine*, *2*(4), 371–388.

Dyer, C. B., Connolly, M-T., & McFeeley, P. (2003). The Clinical and Medical Forensics of Elder Abuse and Neglect. In R. J. Bonnie & R. B. Wallace (Eds.), *Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America. Panel to Review Risk and Prevalence of Elder Abuse and Neglect*. Committee on National Statistics and Committee on Law and Justice, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academies Press.

Fulmer, T., Guadagno, L., Dyer, C., & Connolly, M. (2004). Progress in elder abuse screening and assessment instruments. *Journal of American Geriatrics Society*, *52*(2), 297–304.

Fulmer, T., Paveza, G., Vandeweerd, C., Fairchild, S., Guadagno, L., Bolton-Blatt, M., et al. (2005). Dyadic vulnerability and risk profiling for elder neglect. *The Gerontologist*, *45*(4), 525–534.

Lachs, M. S., & Pillemer, K. (2004). Elder abuse. *Lancet*, *364*(9441), 1263–1272.

Lachs, M. S., Williams, C., O'Brien, S., Hurst, L., & Horwitz, R. I. (1997). Risk factors for reported elder abuse and neglect: A nine-year observational cohort study. *The Gerontologist*, *37*(4), 469–474.

National Center on Elder Abuse (1998). *The National Elder Abuse Incidence Study: Final Report*. Washington, DC: National Aging Information Center.

National Research Council. (2003). *Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America*. Panel to Review Risk and Prevalence of Elder Abuse and Neglect (R. J. Bonnie & R. B. Wallace, Eds.). Committee on National Statistics and Committee on Law and Justice, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

EMPLOYMENT

Employment in old age is the exception among both men and women in the United States. In 2005, only 5.3 million of the more than 35 million noninstitutionalized persons age 65 and older—or 15.1% of the total—were in the labor force and working or looking for work. After World War II, enhanced Social Security benefits and the expansion of private pension coverage put a financially comfortable retirement within reach of growing numbers of workers, millions of whom stopped working, often well before age 65. It was, however, largely men who were ending their work careers. The labor force participation for men older than age 55 dropped sharply in the latter half of the 20th century.

The picture has been very different for women ages 55 to 64, whose labor force participation rate has increased dramatically over the past 5 decades. Women age 65 and older have historically had, and continue to have, weak labor force attachment.

The pronounced march of middle-aged women into the labor force has not offset the withdrawal of men; as a result, there are relatively fewer middle-aged and older workers today than in 1950. For example, nearly 41% of the 55-plus population was employed in 1950; by 2005, that was the case for just 36%. The divergent trends in participation have markedly altered the gender composition of the age 55 and older workforce, which has become increasingly female (U.S. Department of Labor, 2006).

Interest in Employment

Older Americans work for various reasons: They enjoy their jobs; work makes them feel useful; employment is a way to help others; but financial reasons are among the most important (AARP, 2003). Very sizable proportions of workers report that they plan to work at least part-time in retirement, although the extent to which workers realize their expectations remains to be seen. Workers who say they will reduce their work hours as they age apparently have difficulty doing that (Abraham & Houseman, 2005). Moreover, workers have reported that they would be retiring considerably later than retirees actually did (Helman, Greenwald & Associates, & Paladino, 2004). Health problems often force workers to retire prematurely.

Older Persons at Work

The majority of older workers are employed full-time, although interest and involvement in part-time work increase with age. Just over 80% of all workers, but only somewhat more than half of workers age 65 and older, worked full-time in 2005. Part-time work often serves as a transition or bridge to full retirement. Nonetheless, full-time employment among older workers has risen in recent years.

Contingent work, or work that is not expected to last, is rare among workers of all ages, including older Americans. Nontraditional employment arrangements—namely, independent contract work—increases with age. Workers age 65 and older are substantially more likely than other workers to be independent contractors, a work arrangement more common among older men than older women (U.S. Department of Labor, 2005). Older workers are also much more likely than their younger counterparts to be self-employed, many because they moved into self-employment later in life.

Older workers can be found in virtually every industry and occupation. Although older workers are disproportionately represented in agriculture, the industry and occupational distributions of older and younger workers are, on the whole, quite comparable. The service industries claim the greatest share of both older and younger workers, whereas older workers are somewhat more likely to be found in business and management positions, where experience is presumed to be an asset. In general, gender differences in occupation and industry are more pronounced than age differences. Older women, for example, are heavily represented in traditionally female occupations, such as clerical and administrative support.

Unemployment

If they are in the labor force, almost all older persons have jobs. Unemployment rates tend to fall with age, in part because older workers are less likely than younger workers to experience job displacement (Farber, 2005) and in part because access to retirement benefits gives many older workers the option of leaving the workforce if they become unemployed. If older workers withdraw from the labor force when they lose their jobs, they are not counted among the unemployed, even if they would prefer to be working.

Lower unemployment rates for older persons obscure the formidable barriers they experience when they do look for work. When older workers are displaced, the consequences tend to be more severe than they are for their younger counterparts. They are unemployed longer, are less likely to find work, and are more likely to experience earnings and benefits losses when they become reemployed.

Very few older persons who are not in the labor force say they would like to be working (U.S. Department of Labor, 2006). One explanation for such disinterest might be the difficulties they confront during the job hunt. Another is the paucity of attractive part-time options. An expansion of employment opportunities for older workers, especially part-time, might generate greater enthusiasm for postretirement employment. Formal phased retirement programs that allow workers to ease into retirement by reducing their work hours seem to hold promise for retaining workers beyond normal retirement age, but such programs remain rare.

Public Policy and Older Workers

As the 76 million or more baby boomers reach retirement, concern about possible labor shortages has risen, as has interest in the role that longer worklives might play in alleviating the rising costs of supporting an aging population. Public policy to facilitate longer worklives has involved both retirement disincentives and work incentives. A result of the 1983 amendments to the Social Security Act, the age of eligibility for full Social Security benefits, known as the "normal retirement age," is gradually increasing to age 67. Workers are still eligible to collect benefits at age 62, but any benefits collected before the normal retirement age are lower than they were under prior law. This change may discourage some workers from retiring as early as they might have had the law not been amended. The 1983 amendments also increased the Delayed Retirement Credit, which is paid to workers who delay collecting Social Security benefits after the normal retirement age and up through age 69. The resultant higher benefits are designed to encourage workers to postpone benefit receipt. According to the Congressional Budget Office, workers who wait until age 70 to collect their benefits could receive almost double what they would get at age 62 (U.S. Congress, 2004).

In 2000, Congress voted to eliminate the Social Security earnings cap for beneficiaries over the normal retirement age, many of whom lost benefits due to earnings in excess of the cap. This cap was widely viewed as a work disincentive.

The government has also taken steps to eliminate discrimination against older workers, thereby making it easier for them to find or retain work. Although it persists, age-based discrimination against workers and job seekers age 40 and older is illegal under the provisions of the Age Discrimination in Employment Act (ADEA) of 1967 and its subsequent amendments. Most occupations saw the end of mandatory retirement with the ADEA amendments of 1986.

Public-sector programs that might help older workers keep their skills up to date are relatively limited. One of the most significant is the Senior Community Service Employment Program, which provides minimum-wage community service employment and training to low-income elderly, many of whom are women or minorities. The program now has a goal of placing a proportion (i.e., 30% nationally in Fiscal Year 2006) of the participants in unsubsidized jobs.

Into the Future

After decades of decline, labor force participation rates for older persons in the United States stopped falling in the mid-1980s and then began to rise. The increase has been especially pronounced for the 65- to 69-year-old age group, whose participation rate rose by more than 50% between 1985 and 2005. In recent years, the number of older employed persons has also risen markedly.

According to recent projections by the U.S. Bureau of Labor Statistics (BLS), by 2014, the labor force participation rate of persons age 55 and older will rise to 41.2% (Toossi, 2005), still somewhat below what it was in 1950. Although such projections are speculative, especially in today's rapidly changing global economy, participation rates could be higher than projections if many boomers who say they expect to work in retirement actually do so. Boomers may push up the average age of retirement because financial considerations may keep many in the workforce. Many have not saved enough to maintain their current living standards in retirement. Employers have been freezing pension contributions for their workers, cutting back on retiree health benefits, and shifting from defined benefit to defined contribution pension plans. These developments mean that workers have been forced to assume greater responsibility for ensuring their financial security in retirement. Working longer is one way to promote that security. In addition, boomers are better educated and healthier than their counterparts of generations past, which may contribute to higher employment rates.

Furthermore, as the huge baby-boom cohort retires, employers might experience substantial shortages that encourage them to introduce policies and programs—such as more and better part-time work, phased retirement, and training and retraining programs—that attract and retain older workers and keep their skills up to date. Employers might also face greater employment demands for such policies and programs from older workers themselves who need or wish to postpone retirement.

Sara E. Rix

See also

Poverty
Retirement
Social Security
Tax Policy

Internet Resources

AARP - Job and career information
http://www.aarp.org/money/careers

Age discrimination in employment legislation, regulations, guidance, and statistics
www.eeoc.gov

Labor force statistics
http://www.bls.gov

One-stop career centers
http://www.servicelocator.org/

Workforce information
http://www.doleta.gov/usworkforce

REFERENCES

AARP (2003). *Staying ahead of the curve 2003: The AARP working in retirement study*. Washington, DC: AARP. Available at http://assets.aarp.org/rgcenter/econ/multiwork_2003.pdf

Abraham, K. G., & Houseman, S. N. (2005). Work and retirement plans among older Americans. In R. L. Clark & O. S. Mitchell (Eds.), *Reinventing the Retirement Paradigm* (pp. 70–91). Oxford: Oxford University Press.

Farber, H. S. (2005.) What do we know about job loss in the United States? Evidence from the Displaced Workers Survey, 1984–2002. *Economic Perspectives*, 2Q, 13–28. Available at http://64.233.161.104/search?q=cache:kFXk0aMOF_8J:www.chicagofed.org/publications/economicperspectives/ep_2qtr2005_part2_farber.pdf+Farber+%22job+displacement%22+2005&hl=en

Helman, R., Greenwald & Associates, and Paladino, V. (2004). Will Americans ever become savers? The 14th Retirement Confidence Survey, 2004. *Issue Brief* No. 268. Washington, DC: Employee Benefit Research Institute. Available at http://www.ebri.org/pdf/briefspdf/0404ib.pdf

Toossi, M. (2005). Labor force projections to 2014: Retiring boomers. *Monthly Labor Review*, *128*(11), 25–44. Available at http://www.bls.gov/opub/mlr/2005/11/art3full.pdf

U.S. Congress, Congressional Budget Office (2004). Retirement age and the need for saving. *CBO Economic and Budget Issue Brief*, May. Available at http://www.cbo.gov/showdoc.cfm?index=5419&sequence=0

U.S. Department of Labor (2005). Contingent and alternative employment arrangements. February. *News*, USDL 05–1433.

U.S. Department of Labor, Bureau of Labor Statistics (2006). *Employment and earnings*, *53*(1). Washington, DC: U.S. Government Printing Office.

ENVIRONMENTAL MODIFICATIONS: HOME

Most older persons desire to live at home for as long as possible. Familiar surroundings, control over one's daily activities, and established community bonds are among the many benefits. With the rapid growth of home health services and "smart" technologies that monitor health status, living at home can be a viable long-term-care option. But the very home that offers comfort and control can itself be a barrier to independent living. Most dwellings have not been designed to accommodate the sensory, physical, and cognitive disabilities that often accompany aging, a time when a supportive environment is *most* needed (Lawton, 1980). A ramp, walk-in shower, and other modifications can make the difference between living at home or in a facility. In the last decade, the focus on healthy aging has been on diet, exercise, and access to health care. With the coming age wave and the rapid growth of the older population, the home environment needs to be included in healthy aging *and* chronic disease management.

Benefits of Home Modifications

Research on home modifications (HM), defined as environmental modifications and assistive devices, has taken a back seat to design research in institutional settings, where, until recently, long-term-care services were primarily offered and reimbursed. Additionally, HM research presents several challenges, including the variability of subjects and housing structures. However, in the last decade, HM research has emerged to examine its role in (1) the cost-effectiveness of providing care in the home as opposed to an institution; (2) preventing fall injuries; (3) increasing the ability to perform activities of daily living (ADLs); and (4) decreasing caregiving help and burden. The research findings show that HM can:

- improve ADL performance, including bathing, toileting, and transferring (Gitlin, Miller & Boyce, 1999)
- reduce home care costs for frail elders and help to delay institutionalization (Mann, Ottenbacher, Fraas, Tomita & Granger, 1999)
- as part of a fall reduction program, reduce falls among older adults (American Geriatrics Society, 2001)
- enhance caregiver ability to provide assistance and with reduced burden (Gitlin, Corcoran, Winter, Boyce & Hauck, 2001)

Key Strategies to Address Challenges of Home Modifications

Even though HM are increasingly recognized as a key element in successful aging-in-place, problems to intervention abound. Individuals have insufficient knowledge about how the environment can reduce avoidable disability or how to properly assess for and carry out needed modifications. Understanding the major obstacles can assist stakeholders in developing creative strategies for successful interventions.

Increasing awareness of person/environmental fit

Many people blame decreased functioning on age-related decline, not the dynamic interface between the user's capabilities and the designed environment. For example, a person with age-related arthritis may engage in unsafe bathing transfers, blaming difficulties on "getting old" and a "bad knee" instead of the tub's design. Consequently, safer alternatives are not explored. That same individual, however, may be able to bathe/shower in a safe, independent manner using a transfer bench or walk-in shower. Enlightening seniors that difficulties in ADLs are often due to the youth-oriented design of their homes, not their impairment, can promote constructive interventions.

Engaging in prevention and planning

Obvious environmental hazards are often overlooked until injuries or health crises occur. For example, often it is only after a hip fracture that a senior with a shuffling gait will remove slippery area rugs or install stair handrails. Encouraging seniors to engage in preventive strategies can help them focus on the benefits of HM *before the crisis*. Healthy seniors can be counseled to consider HM that increase comfort while reducing fall risk (e.g., grab bars, supportive seating and bedding, nonslip finishes on floors, increased lighting) and to develop contingency plans if their needs change (e.g., first-floor living). Newly diagnosed individuals with impairments that will severely limit mobility over time can be advised to plan for future needs (e.g., ramps, widened doorways, and roll-in showers).

Conducting assessments and solving problems

Some providers encourage patients to have their home environment assessed, but confusion arises over who conducts the assessment: a nurse, occupational or physical therapist, social worker, or family member? To contain health care costs and raise awareness of the value of HM, cross training of health care professionals and consumers is warranted. Another confusing issue is the assessment tool. Many checklists assess for problems but do not offer potential solutions. In considering interventions, no one size fits all, especially in the older population, where there is greater range of physical and psychological differences than in any other age group. Solutions should be tailored to the functional and personal needs of the individual, the characteristics of the housing structure, and the available funding streams. Web-based resources are available that offer practical guidance in conducting assessments and choosing appropriate interventions for general safety and disability-specific interventions. Taking into account personal preferences and offering choices greatly increase chances for success. In the last decade, there has been an explosive growth in senior-friendly products and furnishings that are also aesthetically pleasing. Decorator-colored grab bars and nighttime commodes that resemble regular chairs can take the stigma out of using a "disability" product and increase usage.

Implementation and service delivery

Locating, purchasing, and installing equipment and furnishings and hiring and supervising contractors can require more stamina than many seniors have. Often it is difficult to locate reliable contractors with the necessary skills and understanding of the older population's needs. Providers can assist caregivers and seniors by creating a list of (1) national organizations with members in local communities, including universal-design homebuilders or aging-in-place contractors; and (2) local resources such as home health and home remodeling stores, Senior Centers (a good source for word-of-mouth handyman referrals), Area Agency on Aging, and Center for Independent Living. The National Resource Center on Supportive Housing and Home Modifications also maintains a national listing of agencies involved in HM.

Funding

Lack of government reimbursement has made access to HM beyond the reach of many low-income individuals with disabilities. Until recently, states primarily funded long-term care within the nursing-home setting. Due to cost containment, consumer demands, and new legislation, state funding is being channeled into HM to provide long-term care "in the most integrated setting appropriate to the needs of qualified individuals with disabilities" (Olmstead

Act 1999). For example, the $10 million *Access to Home* Program (2005) funds organizations to assess, coordinate, and implement HM for income-eligible New Yorkers with disabilities so they can remain at home. Funding includes accessibility features (e.g., lifts, widened doorways, remodeled bathrooms) and assistive devices (e.g., raised toilet seats, listening devices).

Increasing access to education and resources

Universities and nonprofit organizations are actively promoting living environments that promote lifetime usage. A wide variety of resources on aging and design is available to educate consumers and providers, including online courses and tours of homes that have accessibility features as an integral part of the design (i.e., universal design).

The Future Is Now—The “Smart” House

“Smart” monitoring technologies can further help extend independent living for seniors who are frail, have chronic health conditions, or memory disorders. These systems can monitor health status (e.g., glucose or blood pressure changes), ADLs, and environmental conditions, sending data to caregivers via computers (i.e., broadband wiring) or by regular telephone lines. These passive systems allow distant caregivers to assess whether a person is able to live alone or needs additional support, or if emergency attention is required. Most systems use wireless sensors to record activity within the home, sending alerts when there are deviations from the norm—for example, in a person’s getting-up time, medication usage, or meal preparation. Caregivers can then determine if the person is sick, has fallen, or needs an activity reminder. Environmental hazards (e.g., extreme indoor temperature) are also recorded. Although passive monitoring can present ethical issues—for example, if an adult child uses the system without consent in the home of a parent with dementia—these new technologies have tremendous potential to reduce health care costs and extend independent living.

Other smart home systems anticipate a person’s routines and accordingly control environmental features, such as lighting, heating, and cooling systems. On the horizon are new technologies to help persons with dementia live at home with greater efficiency and safety, including ADL prompting and cueing using audio and visual cues, automatic stove turnoffs, and caregiver alerts during nighttime wandering.

Preparing for the Future

The home environment, along with diet, exercise, and health care, is a key factor in quality of life and ability to age in place. Along with addressing the housing needs of the existing senior cohort, baby boomers should be encouraged to plan for their retirement. This techno-savvy cohort will more readily accept and demand accessible, attractive, and smart features that promote independence and well-being. With the coming age wave, we have an exciting opportunity to transform the existing youth-oriented housing model into user-friendly residences that encourage health and independence at all ages.

ROSEMARY BAKKER

See also

Environmental Modifications: Institutional
Ergonomics
Technology

Internet Resources

Center for Inclusive Design and Environmental Access, University of Buffalo
http://www.ap.buffalo.edu/idea

Center for Universal Design, North Carolina State University
http://www.design.ncsu.edu

National Resource Center on Supportive Housing and Home Modification, University of Southern California
http://homemods.org

Rehabilitation Engineering Research Center on Technology for Successful Aging, University of Florida
http://rerc.phhp.ufl.edu

Weill Medical College of Cornell University
http://www.cornelleg.org

REFERENCES

American Geriatrics Society, British Geriatrics Society, American Academy of Orthopedic Surgeons (2001). Guideline for the prevention of falls in older persons. *Journal of American Geriatrics Society*, *49*(5), 664–672.

Gitlin, L. M., Corcoran, M., Winter, L., Boyce, A., & Hauck, W. W. (2001). A randomized, controlled trial of a home environmental intervention: Effect on efficacy and upset in caregivers and on daily function of persons with dementia. *The Gerontologist*, *41*(1), 4–14.

Gitlin, L. M., Miller, K. S., & Boyce, A. (1999). Bathroom modifications for frail elderly renters: Outcomes of a community-based program. *Technology and Disability*, *10*, 141–149.

Lawton, M. P., (1980). Housing the elderly, residential quality and residential satisfaction. *Research on Aging*, 2, 309–328.

Mann, W. C., Ottenbacher, K. J., Fraas, L., Tomita, M., & Granger, C. V. (1999). Effectiveness of assistive technology and environmental interventions in maintaining independence and reducing home care costs for the frail elderly. *Archives of Family Medicine*, 8, 210–217.

ENVIRONMENTAL MODIFICATIONS: INSTITUTIONAL

The field of long-term care, particularly related to nursing homes, is under tremendous pressure to change. Traditional environmental approaches based on staff-centric or medical models are no longer considered appropriate in long-term-care settings such as nursing homes. The new emphasis is on person-centered or self-directed care. This is reflected in settings where people can live comfortably and feel at home, as opposed to feeling like they are in a hospital. Increasingly, nursing homes are working to be more like assisted-living facilities, which emphasize privacy, dignity, and choice. These changes affect all aspects of care from structure of governance to staff training to management structure and facility design. This discussion focuses on the key physical environmental criteria that reflect this new approach.

Many of the design criteria that reflect a resident-centered approach have their antecedents in the special care units for people with dementia movement of the late 1980s and 1990s. This perspective recognizes that individuals with Alzheimer's disease and related dementias often do not need as much focus on medical care but rather need help structuring their life so it has meaning and is not overwhelming. This led to the creation of smaller groups of individuals living together in settings more reflective of a home because it is a familiar setting that these individuals could relate to better than the unfamiliar hospital-like arrangement of most nursing homes. Eventually, designers and providers began to realize that the constructs for what made a good environment for people with dementia were the same for anyone who needed the support of a shared residential setting (e.g., nursing home, assisted living, group home). These key constructs are described herein. Different criteria may apply to short-term rehabilitation units where many people desire a more medically oriented model, possibly because people want to assure themselves they are getting the best medical care before returning home.

Scale

One of the largest, and perhaps most difficult changes to achieve, particularly within existing long-term-care facilities, is the breakdown of the scale of spaces in which residents spend time. Traditionally, nursing units were based on groups of 40 to 60 beds arranged along long, double-loaded corridors, with a single large multipurpose room across from the nursing station that served for group activities and meals. Under the new guidelines, residents are grouped in households of 7 to 24 residents, with all the spaces a typical house has. Research demonstrates more positive outcomes associated with smaller groups of residents and staff interacting together, including decreased anxiety and depression; less usage of antibiotics and psychotropic drugs; higher motor functions; more mobility, social interaction, and friendship-formation; and more supervision and interaction between staff and residents (McAllister & Silverman, 1999).

Unit Configuration and Familiar Spaces

Traditional institutional-care settings were laid out along long, straight corridors to maximize staff's ability to monitor residents while sitting behind the centrally located nursing station. With the breakdown of the scale of spaces, there is a corresponding emphasis on including spaces that are more reflective of the types of spaces people have at home: kitchens with tables where you can comfortably sit and chat with others or read the paper, living rooms with fireplaces and books and games that invite casual interaction, and outside spaces with accessible garden areas for all to enjoy. Increasingly, attention is being given to the arrangement of these spaces so that the "front door" of the household opens onto these shared social spaces, and bedrooms and bathing areas are in more private areas at the back of the household—as they typically are at home. This type of configuration appears to have a positive impact on orientation: cluster facilities (consisting of small units of residents' rooms and associated common spaces) are associated with higher levels of orientation than were more traditional institutional facilities where common spaces, separated from residents' rooms, are shared by larger groups of residents (Day & Calkins, 2002).

Privacy

There is strong evidence linking lack of privacy to myriad negative outcomes (Carboni, 1990). Traditional long-term-care settings provide little in the way of privacy protections: bedrooms are shared with one to three other people, separation between personal space is limited to a curtain, staff routinely enter bedrooms without knocking and waiting to be invited in, and there are no other spaces where one can be alone or share a private visit with family and friends. Provision of privacy is one of the hallmark principles of assisted living. Although the Assisted Living Workgroup could not come to consensus on whether a private room was a necessary component of assisted living (Assisted Living Workgroup, 2003), there is a clear association of positive outcomes associated with private rooms, including fewer nosocomial infections and hospitalizations, decreased staff time spent managing roommate conflicts, and reduced housekeeping and maintenance costs. Nursing homes have also seen the development of some ingenious privacy-enhanced shared rooms, where each individual has each an equally accessible, spatially defined territory that includes his or her own window and access to a shared bathroom. Anecdotal sources suggest that residents find these rooms acceptable, even calling them "private" rooms (Calkins & Cassella, 2006).

Personal Possessions

One of the traumatic aspects of leaving one's home and relocating into a shared residential setting is the loss of personal possessions, which reflect both personality and a life-time of memories, accomplishments, and activities. Lack of personal possessions also make it harder for staff to get to know residents as people, not just diagnoses or bodies that need care and assistance. This is especially true for those with communication difficulties such as persons with dementia or expressive aphasia. Increasingly, both policies and environments are changing to accommodate and actively encourage bringing more personal possessions, from furniture (including larger beds, if state codes allow for this) to art and memorabilia. Placement of these items is not always limited to the individual's bedroom. China cupboards or other large pieces are sometimes placed in the shared spaces, which helps people to feel like the whole household is their home.

Lighting

Although there has been solid research for decades documenting the changes to vision that occur with aging, many traditional long-term-care settings primarily focused on lighting for staff tasks, not resident functioning. There is greater focus on increasing the amount of ambient lighting while decreasing glare from direct sunlight or exposed/visible light bulbs. When spaces are higher than 9 feet, it is possible to use indirect lighting, where the light is bounced up and off the ceiling, to provide an even reflected light. Research has shown that increasing light and contrast at the place-setting can increase both independence in eating and caloric intake by as much as an average of 1,000 calories per day (Brush, Threats, & Calkins, 2003). Low lighting levels are associated with lack of orientation and higher levels of agitation (Elmståhl, Annerstedt, & Åhlund, 1997).

MARGARET P. CALKINS

See also
Environmental Modifications: Home
Ergonomics
Signage
Wandering

Internet Resources
American Institute of Architects
http://www.aia.org/dfa_default

Dementia Design Info
http://www.DementiaDesignInfo.org

Ideas Institute
http://www.IDEASInstitute.org

Innovative Designs in Environments for an Aging Society
http://www.IDEASConsultinginc.com

Society for the Advancement of Gerontological Environments
http://www.SAGEFederation.org

REFERENCES

Assisted Living Workgroup Report to U.S. Senate Special Committee on Aging (2003). Topic Group Recommendations: Definition and Core Principles. Washington, DC. *Assisted Living Workgroup*, 11–22.

Brush, J. A., Threats, Travis T., & Calkins, M. P. (2003). Influences on perceived function of a nursing home resident. *Journal of Communication Disorders*, *3*, 379–393.

Calkins, M., & Cassella, C. (2006). *Exploring the cost and value of private versus shared bedrooms in nursing homes*, 1–48. Kirtland, OH: IDEAS Institute..

Carboni, J. (1990). Homelessness among institutionalized elderly. *Journal of Gerontological Nursing 16*(7), 32–37.

Day, K., & Calkins, M. P. (2002). Design and dementia. In R. B. Bechtel & A. Churchman (Eds.). *Handbook of Environmental Psychology*. New York: John Wiley & Sons.

Elmståhl, S., Annerstedt, L., & Åhlund, O. (1997). How should a group living unit for demented elderly be designed to decrease psychiatric symptoms? *Alzheimer Disease and Associated Disorders*, *11*(1), 47–52.

McAllister, C. L., & Silverman, M. A. (1999). Community formation and community roles among persons with Alzheimer's disease: A comparative study of experiences in a residential Alzheimer's facility and a traditional nursing home. *Qualitative Health Research*, *9*(1), 65–85.

Skea, D., & Lindesay, J. (1996). An evaluation of two models of long-term residential care for elderly people with dementia. *International Journal of Geriatric Psychiatry*, *11*, 233–241.

ERGONOMICS

In general, today's elderly are healthier, more diverse, and better educated than previous generations. People are living longer than ever before and the number of people reporting very good health and improvements in physical functioning, such as the ability to walk a mile or climb stairs, has increased in recent years. Although disability rates among older people are also declining, the likelihood of developing a disability or cognitive impairment increases with age. Many older adults are also disabled in one or more aspects of self-care and, in general, the elderly use more health care services and incur higher health care costs than younger people. As the elderly population increases and people live longer, more people will require help with aspects of daily living or disease management. Thus, there is a clear need for strategies to help healthy older people remain productive and independent and to help those who are frail or disabled receive care and support so that they can live in the community for as long as possible.

Ergonomics (or human factors engineering)—the study of human beings and their interactions with products, equipment, and environments in the performance of tasks and activities—offers great potential in terms of enhancing the independence and quality of life of older people. The overall objectives of ergonomics are to improve the fit between people and the designed environment so that performance, safety, comfort, and user satisfaction are maximized and the likelihood of errors, injury, fatigue, and user dissatisfaction are minimized. To achieve this objective, ergonomics espouses a systems approach to design and a user-centered design approach. With respect to aging, this implies that age-related changes in capabilities, tendencies, and preferences are incorporated into guidelines for design within the contexts of products, tasks, and environments (Rogers & Fisk, 2000).

Essentially, the ergonomic focus on user-centered design can address the problems of older adults and help them retain and enjoy independence in their later years. One area that could benefit tremendously from the application of ergonomics is health care. Ergonomic principles and methods can improve the lives of elders in areas such as e-health applications, medication adherence, health care delivery, warnings and instructions, home safety, and the design of assistive devices.

Medication Adherence

Medication nonadherence, or failure to take medications as prescribed, is a common problem among older adults and is a significant predictor of hospital admissions. Generally, the problem involves failing to take a prescribed medication, taking the incorrect dosage, taking medications at improper times or in the wrong combinations, and failing to comply with special instructions such as dietary restrictions. Noncompliance is particularly problematic for older people because of the high medication use among this age group and their greater susceptibility to side effects and drug interactions.

The problem of medication nonadherence is complex and may be attributable to numerous factors, such as an individual's perceptions or beliefs (e.g., the person does not believe that he or she is ill or that the medication is effective), cognitive problems (e.g., difficulty comprehending or remembering medication instructions), and ineffective strategies to enhance medication compliance. Many of these problems can be ameliorated by ergonomic solutions, such as products and devices that improve the organization of medications, including calendars, electronic pill dispensers, or compartmentalized containers that are congruent with a medication schedule. These devices help offset memory problems associated with comprehending and integrating medication schedules. Voice mail or beepers might also be employed to help individuals remember to take medications. Automated telephone messaging is effective in improving medication adherence and appointment attendance and in monitoring community-dwelling elderly and chronically ill patients. Other solutions include improvements in medication packaging or labeling. Educating individuals about the nature of their illness and the importance of medication in illness management is another potential solution. It is important to understand the cause of nonadherence so that the appropriate intervention can be selected (Park & Jones, 1997).

Health Care Delivery and Health Care Access

Ergonomic applications can also improve health care delivery for those who are frail or have restricted mobility. Ergonomics may also facilitate access to health care information and services and enhance the ability of health care professionals to deliver care. For example, computers and information technologies, such as e-mail and the Internet, can help older people access information about a particular illness, medication, diet, or exercise program. Interactive health communication or "e-health" generally refers to the interaction of an individual with an electronic device or communication technology such as the Internet to access or transmit health information or to receive or provide guidance and support on a health-related issue (Robinson, Eng, & Gustafson, 1998). The scope of e-health applications is fairly broad but mostly encompasses searching for health information, participating in support groups, and consulting with health care professionals. Currently, there are more than 70,000 Web sites that provide health information and in 2003, 77 million American adults searched the Internet for health information (Pew Internet and American Life Project, 2003). The fact that consumers have access to e-health applications has significant implications for both patients and providers. On the positive side, access to health information can empower patients to take a more active role in the health care process. Patient empowerment can result in better informed decision making, better and more tailored treatment decisions, stronger patient–provider relationships, increased patient compliance, and better medical outcomes.

On the negative side, access to this wide array of health information can overload both patient and physicians, disrupt existing relationships, and lead to poor decision making on the part of consumers. The Internet can also help older people communicate with health care providers or other people with similar problems. Several studies have shown that on-line support groups are beneficial for this population. This type of technology may be particularly beneficial for hearing-impaired or aphasic individuals. However, for these technology-based applications to be successful, the technology must be relatively simple to use, readily available, and affordable, and adequate training must be provided. In addition, issues such as credibility of information, privacy, and trust need careful consideration.

Health care providers can use technology to communicate with older patients; remind them of appointments and home health care regimens, such as dietary schedules; and check on a patient's general health status. With telemedicine, physicians can directly assess patients and measure blood pressure, gait, and cognitive status. The term *telemedicine* refers to a wide range of technologies, from simple telephone connections to live two-way video and audio transmissions (i.e., interactive television). For example, with telemedicine, physicians can measure vital signs and ask hypertensive patients about disease manifestations and drug side effects. The cost of the technology varies with the sophistication of the system.

Although studies indicate that older people are receptive to using new technologies, they often encounter difficulty because of poor training or failure on the part of designers to consider their needs and preferences. For example, when using computers, older people often have difficulty locating screen targets or reading screen characters; these types of problems can often be corrected by increasing font size or reducing screen clutter. User testing and user-centered design are critical to the success of technical systems. Guidelines for human-computer interaction suggest how computers and other forms of technology can be useful to and usable by older adults (Czaja & Lee, 2002; Fisk, Rogers, Charness, Czaja, & Sharit, 2004). Examples of these guidelines include highlighting important screen information, maximizing the size of icons, avoiding complex command languages, and providing on-line aid.

Assistive Devices and Labeling

Data indicate that older people spend much of their time performing basic living activities and spend a great deal of time at home. Many have difficulty performing home tasks, and the rate of home accidents is high in this population. Thus, there is a critical need to employ strategies that allow older people to live safely and comfortably at home, especially those with impairments. Often, this requires some type of home modification or the use of an assistive device such as a walker or grab bar.

Task analysis can identify problems in homes or in the performance of home tasks. There are also guidelines for the design of home environments, products, and assistive devices. It is important to recognize the interaction among personal characteristics, environmental conditions, and device characteristics when selecting devices. In addition, given the increasing emphasis on self-care and the growing number of medical devices that will be used at home, knowledge of the aging process is necessary to guide the design and selection of these devices.

Ergonomic input is also important in the design and content of warning labels and instructions in response to age-related changes in sensory and perceptual systems and cognition. Use of ergonomic guidelines can make it easier for older people to perceive and comprehend warning information. These guidelines include using simple and concise language, minimizing the amount of irrelevant information, and using pictures or graphic examples.

Ergonomics is concerned with enhancing the fit among people, tasks, environments, and products. The application of ergonomics to issues associated with aging can improve the health, safety, and quality of life of older people. The basic premise of ergonomics is that improvements in performance result from user-centered design and a fundamental understanding of user capabilities, needs, and preferences. According to this premise, improving the health and quality of life of older people requires that knowledge of aging be applied to the design of products and environments.

Sara J. Czaja

See also

Assistive Technology
Environmental Modifications: Home
Environmental Modifications: Institutional
Medication Adherence
Support Groups

Internet Resource

Center for Research and Education on Aging and Technology Enhancement
www.create-center.org

REFERENCES

Czaja, S. J., & Lee, C. C. (2002). Designing computer system for older adults. In J. Jacko & A. Sears (Eds.), *Handbook of human-computer interaction*. New York: Lawrence Erlbaum and Associates.

Fisk, A. D., Rogers, W., Charness, N., Czaja, S. J., & Sharit, J. (2004). *Designing for older adults: Principles and creative human factors approaches*. London: Taylor and Francis.

Park, D. C., & Jones, T. R. (1997). Medication adherence and aging. In A. D. Fisk & W. A. Rogers (Eds.), *Handbook of human factors and the older adult* (pp. 257–288). San Diego, CA: Academic Press.

Pew Internet & American Life Project (2003). Internet Health Resources. Available on-line at http://www.pewinternet.org/pdfs/PIP_Health_Report_July_2003.pdf

Robinson, T. N., Eng, P. K., & Gustafson, D. (1998). An evidence-based approach to interactive health communication: a challenge to medicine in the information age. *Journal of the American Medical Association, 280*, 1264–1269.

Rogers, W., & Fisk, A. (2000). Human factors, applied cognition, and aging. In F. I. M. Craik & T. A. Salthouse (Eds.), *The handbook of aging and cognition*. Mahwah, NJ: Lawrence Erlbaum Associates.

ETHICS CONSULTATION

Clinical ethics consultation is a service that an individual or group provides to help health care professionals, patients, and families identify and resolve ethical conflicts and problems that arise in the care of patients. The practice of offering clinical ethics consultations began informally in the 1970s and during the past 35 years has become an established part of the clinical services of many health care institutions. The increased importance of ethics consultation can be traced to at least two sources: the rapid growth of medical technology, which has presented patients, families, and health care providers with new and difficult ethical choices; and the rise of the patient's rights movement and the correlative attack on medical paternalism. Clinical ethics consultation was also given a major impetus by the Joint Commission for the Accreditation of Health Care Organizations, which in 1992 mandated that all accredited health care institutions have a "mechanism" for dealing with disputes concerning end-of-life care.

Modes of Clinical Ethics Consultation

Clinical ethics consultations can be conducted in various ways: by an ethics committee, by a small team (possibly a subgroup of the ethics committee), or by individual consultants. Consultations by committee are often difficult to organize in a timely fashion and may become bureaucratic and depersonalized, but they can provide multiple perspectives and reveal relevant aspects of a case that might otherwise be overlooked. Consultations by individuals—typically clinicians, lawyers, or philosophers specializing in bioethics—are generally more flexible and personal and can be arranged more expeditiously. Many ethics consultative services require that individual consultants report to an ethics committee or consultation group, either for retrospective review of cases or for help with ongoing cases. This supervision provides peer review and quality assurance and is a way of holding consultants accountable for their activities. Consultations by small teams occupy a middle ground between these two approaches.

Goals of Clinical Ethics Consultation

The main goal of clinical ethics consultation is to improve the quality of care by providing a mechanism for the identification, analysis, and resolution of ethical problems and conflicts that arise in the clinical setting. Other important goals include facilitating institutional efforts at quality improvement by identifying common sources of ethical problems and helping health care providers handle ethical problems by providing education in clinical bioethics (Thomasma, 1991).

Roles of the Clinical Ethics Consultant

The role of the clinical ethics consultant has been described variously as professional colleague, educator, facilitator of moral reflection, mediator of moral conflict, and patient advocate. Associated with each description is a particular set of skills and competencies (American Society for Bioethics and Humanities, 1998; La Puma & Schiedermayer, 1991). Some view the consultant primarily as a patient advocate responsible for protecting the patient's rights and interests; others perceive the consultant as a neutral mediator whose goal is to forge consensus among the involved parties, all of whose rights, interests, and responsibilities are acknowledged. Complete neutrality, however, is neither possible nor desirable, because an ethics consultant must strive not just for a mutually agreeable solution but also for a morally principled consensus (Gibson, 1999). At the same time, ethics consultants should not be considered moral police; their authority is qualitatively different.

A model that has attracted considerable interest in the field of ethics consultation is *mediation* (Dubler & Liebman, 2004). Ethics consultants, as mediators, use many of the techniques of classical mediation, including active listening, reframing, acknowledging the feelings and concerns of the involved parties, and developing options. However, these techniques must be modified to fit the peculiar features of the medical setting.

As facilitators of moral reflection, consultants are regarded as having particular skills and knowledge that their professional colleagues lack. What they bring to the clinical encounter is not "the right answer" but rather the ability to uncover value conflicts, articulate different moral positions on issues, and apply moral reasoning and ethical theory to the issue at hand.

There is a considerable literature on whether there is such a thing as *ethical expertise* and whether the ethics consultant has or is supposed to have it (Agich, 1995; Yoder, 1998). The notion of ethical expertise, however, has a number of unfortunate connotations. Properly understood, the role of the ethics consultant is to offer reasoned ethical advice and guidance to patients, families, and health professionals, not to make decisions or to override the views of others. A criticism related to concerns about ethical expertise is that ethics consultation promotes the segregation of ethical decision making from the clinical practice of medicine. However, this danger can be avoided if ethics consultants work collaboratively with clinicians and regard the education of staff as one of their main responsibilities.

Issues Addressed by Clinical Ethics Consultants

Patients, families, and health care professionals may call on clinical ethics consultants to address a wide range of issues, including the following:

- confidentiality and privacy
- decisional capacity
- informed consent and truth-telling
- surrogate decision making
- withdrawal or withholding of life-sustaining treatment
- the shift from curative to palliative care
- allocation of scarce medical resources
- conflicts among health care providers
- the role of economic considerations in clinical care

The patient's attending physician retains decision-making responsibility and authority. As such, the physician should be informed that an ethics consultation has been requested and the source of the request (i.e., patient, family member, or other member of the health care team).

Competencies of the Clinical Ethics Consultant

The core competencies of ethics consultants can be divided into two categories: skills and knowledge. Core skills include the ability to:

- identify the value conflict or problem in the clinical situation
- listen attentively, respectfully, and supportively to the involved parties
- elicit the interests and moral concerns of all involved parties
- promote effective communication among the involved parties
- articulate care options and their consequences
- work toward moral consensus

Core knowledge includes competency in the following:

- terms used in the diagnosis, treatment, and prognosis of common medical problems
- key bioethical concepts, principles, and theories
- techniques of moral reasoning
- main ethical positions on important clinical issues
- applicable health law
- the organization, corporate structure, and culture of the institution

Evaluation of Clinical Ethics Consultation

Evaluation of clinical ethics consultation is a matter of considerable interest and debate among those in the field. Meaningful evaluation of the ethics consultation is particularly important in light of efforts to control health care costs by eliminating unnecessary and unprofitable services. Such an evaluation must keep in mind the goals of that consultation. Both the process of consultation and its outcomes need to be evaluated. Process is evaluated by asking whether the consultation was conducted in a timely fashion, whether all interested parties were included in the consultation, and whether participants were satisfied with the quality of communication. Outcomes are evaluated by asking such questions as whether a principled ethical resolution of the problem was achieved, whether the participants were satisfied with the outcome, whether the consultation altered the plan of care, and whether the consultant's services were frequently used. Chart reviews, questionnaires, and interviews are some useful evaluation techniques.

JEFFREY BLUSTEIN

See also
Advance Directives
Hospice
Palliative Care
Physician-Assisted Suicide and Euthanasia

Internet Resources

Bioethics Consultation Service, Montefiore Medical Center, Department of Epidemiology and Social Medicine
http://www.bioethicsmontefiore.org/prof/clinical/desm/progserv/bioethic/index.html

Core Competencies for Health Care Ethics Consultation, American Society for Bioethics and the Humanities
http://www.asbh.org/papers/

REFERENCES

Agich, G. (1995). Authority in ethics consultation. *Journal of Law, Medicine & Ethics*, *23*, 273–283.

American Society for Bioethics and Humanities (1998). *Core competencies for health care ethics consultation*. Glenview, IL: American Society for Bioethics and Humanities.

Dubler, N. N., & Liebman, C. B. (2004) *Bioethics mediation: A guide to shaping shared solutions*, New York: United Hospital Fund.

Gibson, K. (1999). Mediation in the medical field: Is neutral intervention possible? *Hastings Center Repor,t 29*(5), 6–13.

La Puma, J., & Schiedermayer, D. L. (1991). Ethics consultation: Skills, roles and training. *Annals of Internal Medicine*, *114*(2), 155–160.

Thomasma, D. C. (1991). Why philosophers should offer ethics consultation. *Theoretical Medicine*, *12*, 129–140.

Yoder, S. D. (1998). “Experts in ethics? The nature of ethical expertise.” *Hastings Center Report*, *28*(6):11–19.

EUTHANASIA

Euthanasia comes from Greek words meaning “a gentle and easy death” and “the means of bringing about a gentle and easy death.” Most ancient Greek and Roman practitioners, Socrates, Plato, and Stoic philosophers from Zeno to Seneca, supported physician-induced death of the sick and suffering to bring about a gentle and easy death (Vanderpool, 1995). In contrast to these dominant Graeco-Roman traditions, the *Hippocratic Oath* required physicians to swear “neither to give a deadly drug to anybody if asked for it, nor . . . [to] make a suggestion to this effect” (Edelstein, 1989, p. 6). The Oath, which continues to exert a towering influence in Western medicine, reflects the Pythagorean conviction that human beings are owned by God or Gods and should abide by a divine determination of life’s completion (Carrick, 1985).

In contemporary usage, discussion of euthanasia has increasingly dealt with “the action of inducing a gentle and easy death.” Thus, ethical debates about the permissibility of physician involvement in euthanasia concern the question: Are physicians ethically permitted to act to end a patient’s life? This question should be distinguished from other ethical questions that may arise at the end of life. For example, as the term *euthanasia* is commonly used today, it does not concern questions related to refraining from using or continuing life-sustaining treatments (i.e., passive euthanasia), nor does it concern questions related to providing patients with the means necessary to end their own lives (i.e., assisted suicide). Many who defend the permissibility of physician-assisted suicide do not support physician-assisted euthanasia. Advocates of physician-assisted suicide approve of letting physicians prescribe medications that patients may use to end their life; they do not necessarily approve of letting physicians actually administer, for example, lethal injections, for the purpose of terminating a patient’s life.

Ethical Perspectives

Contemporary ethical arguments supporting euthanasia often appeal to compassion for the suffering of a terminally ill and imminently dying patient. These arguments purport to show that physician aid in dying is ethically permissible under circumstances where the patient’s condition is associated with severe and unrelenting suffering that is not the result of inadequate pain control or comfort care.

Alternatively, arguments defending the permissibility of euthanasia make reference to the ethical principle of autonomy. The principle of autonomy requires respecting the informed choices of competent patients. Under this approach, physician involvement in euthanasia is ethically limited to situations in which competent patients make informed repeated requests for aid in dying.

Critics of euthanasia charge that both compassion- and autonomy-based ethical arguments are inadequate. Arguments invoking compassion are faulted on the ground that there is no principled basis for limiting euthanasia to competent patients who choose it. After all, many suffering patients are not competent. Therefore, if the ethical basis for providing aid in dying is compassion, then aid in dying should logically be extended to incompetent persons.

Arguments relying on the ethical principle of autonomy are also criticized for failing to offer a principled basis for appropriately limiting euthanasia. Thus, autonomy-based arguments do not require limiting euthanasia to patients who experience severe and unrelenting suffering but would presumably allow applying euthanasia to healthy people who wished to die. Critics of autonomy-based arguments also doubt that patients' requests to die reflect patients' autonomous choices. Instead, such requests may occur due to inadequate palliative and comfort care, continued use of invasive and futile interventions, and failure to diagnose and treat other underlying causes of the request, such as depression (Emanuel, 1999). In such cases, meeting a patient's request for assistance in dying is not supported by a principle of respect for patient autonomy.

Both autonomy- and compassion-based arguments are vulnerable to the further objection that there is no principled basis for restricting euthanasia to persons who are imminently dying. After all, the prospect of suffering for a long period is arguably worse than the prospect of suffering briefly. Likewise, the principle of respect for autonomy presumably applies to all competent individuals, irrespective of whether they are about to die.

Legal Perspectives

Just as the ethical status of euthanasia is controversial, the legal status of both euthanasia and assisted suicide is the subject of intense debate in the United States. At present, legislative statues make assisted suicide a criminal act in 29 states; however, the constitutionality of these statues has been challenged in the states of Michigan and Washington. Defenders of physician-assisted death have placed citizen initiatives on the ballots of several Western states to decriminalize euthanasia and/or assisted suicide. In 1997, Oregon passed the Oregon Death With Dignity Act, which allows terminally ill Oregon residents to obtain from their physicians prescriptions for self-administered, lethal medications. However, the act specifically prohibits euthanasia by barring physicians (and others) from directly administering a medication to end a patient's life.

Although euthanasia is illegal in the United States and in most other nations, it is no longer against the law in The Netherlands. In 2002, the Dutch Parliament passed an act formally exempting physicians from criminal liability for euthanasia and assisted suicide, provided certain conditions are met. These conditions include that (1) the patient's request is voluntary and well considered; (2) the patient experiences lasting and unbearable suffering; (3) the physician has informed the patient about the situation and prospects; (4) the physician and patient believe there is no other reasonable solution; (5) the physician consults with one other independent physician regarding conditions 1 through 4; and (6) the physician exercises due care in terminating life or assisting with suicide.

Euthanasia and the Elderly

Although debates about euthanasia apply to persons of all ages, they may bear special relevance to elderly persons. This is because death is nearer in old age and, therefore, aging individuals may be more likely than younger persons to think about death and the dying process. Perhaps the aging of the population that is occurring in most developed nations will lead societies to focus greater attention on how to assure humane care at the end of life. The question of whether euthanasia represents humane medical care for dying patients will continue to be discussed.

NANCY S. JECKER

See also
Physician-Assisted Suicide and Euthanasia

Internet Resources
Canadian Medical Association Journal
http://www.cma.ca/cmaj/vol-156/issue-10/1405.htm

Longwood College Library
http://web.lwc.edu/administrative/library/suic.htm

REFERENCES

Carrick, P. (1985). *Medical ethics in antiquity: Philosophical perspectives on abortion and euthanasia*. Dordrecht, Netherlands: D. Reidel.

Edelstein, L. (1989). O. Temkin & C. L. Temkin (Eds.), *Ancient medicine: Selected papers of Ludwig Edelstein*. Baltimore, MD: The John Hopkins University Press.

Emanuel, L. L. (1999). Facing requests for physician-assisted suicide. *Journal of the American Medical Association*, *280*(7): 643–647.

Vanderpool, H. Y. (1995). Death and dying: Euthanasia and sustaining life. In *Encyclopedia of Bioethics* (Rev. ed., pp. 554–561). New York: Simon & Schuster, MacMillan.

EVIDENCE-BASED HEALTH CARE

In this world of rapidly developing technology, health care providers find themselves bombarded with new information, and they do not have enough time to stay abreast of the rapid advances in medical science. At the time this was written, MEDLINE, The National Library of Medicine's (NLM's) online database of life sciences and biomedical bibliographic information, covered more than 4,800 journals published in the United States and more than 70 other countries. The number of citations in PubMed (a service of the U.S. National Library of Medicine that includes citations from MEDLINE and other life science journals, as well as links to full text articles and other resources) has surpassed 16 million. The Cumulative Index to Nursing and Allied Health Literature (CINAHL) had 80,195 citations for 2005 and contained 1,179,025 citations from 1982 through 2005. It is not surprising that health care providers are feeling overwhelmed.

Health care providers seek the most current and reliable evidence on the validity of diagnostic tests, the effectiveness and safety of therapeutic modalities, and accuracy and precision of prognosis data (Straus, 2002). Evidence-based medicine (EBM) has been proposed as a method to search efficiently for information that will contribute to optimal patient care. Evidence-based medicine traces its philosophical roots to the 19th century. At that time, medical schools developed new approaches to education with an emphasis on developing partnerships with universities, associating with teaching hospitals, and using basic science and clinical research in training (Straus, 2005). With these advances, medical education continues throughout a professional's life. Originally outlined in a series of articles by a group of clinical epidemiologists at McMaster University in Hamilton, Ontario, for the Canadian Medical Association Journal in 1981, EBM was a term developed in 1992 and initially defined as the "conscientious and judicious use of the current best evidence from clinical care research in the management of individual patients" (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). Recently, it has been suggested that a more appropriate term is "evidence-based clinical decision making," decisions based on "patients' circumstances, patients' preferences and actions, and best research evidence, with a central role for clinical expertise to integrate these components." *Clinical expertise* is defined as the individual health care provider's ability and judgment gained through clinical practice that identifies the patient's health status, the benefits and risks of possible therapeutic modalities, and the patient's health care preferences. *Best research evidence* refers to clinically pertinent research, especially in the area of basic science that is patient-centered and can impact clinical practice in the areas of diagnosis, treatment, and prognosis. *Clinical state and circumstances* is where the patients find themselves as they seek medical care. *Patients' preferences and actions* is the unique perspective that the patients bring to their care, based on their own values and expectations (Haynes, Devereaux, & Guyatt, 2002; Sackett et al., 1996; Strauss, 2005).

In describing EBM, the McMaster group outlined five basic steps. First, the health care provider should identify a problem based on a clinical need and translate this problem into an answerable question. Second, the clinician should efficiently acquire the best evidence. Third, the health care provider should critically appraise the evidence for its validity and usefulness utilizing biostatistical approaches in thinking. Fourth, the clinician should integrate the evidence with clinical acumen and the patient's state and circumstance. Fifth, the health care provider should evaluate his or her own performance. In summary, the clinician should ask, acquire, appraise, apply, and assess when integrating research into clinical practice. EBM is an efficient, systematic method to attain this goal (Haynes et al., 2002; Sackett et al.,1996).

The developers of EBM are fully aware that not all "research evidence" is "created equal" (Haynes et al., 2002). Therefore, the McMaster group and other academicians formed the Evidence-Based Medicine Working Group to develop detailed guides on how to appraise critically the literature based on a specific clinical question. These guides can be found as a series in the Journal of American Medical Association (JAMA) or now as a comprehensive book. The most appropriate study design will depend on the specific clinical question. The best study designs for each type of clinical question are as follows: diagnosis question=cross-sectional study, treatment question=randomized controlled trial, prognosis question=cohort study, and etiology question=cohort or case-control (Guyatt & Rennie, 2001). To evaluate the quality of evidence, Straus et al. developed a hierarchy of evidence that places more significance on certain types of studies (Straus et al., 2002).

An outcome's clinical significance is determined by the magnitude of its effect, and specific terms often appear in the literature, which include the following (Guyatt & Rennie, 2001):

- Event Rate: the proportion of patients in a group in whom an event is observed
- Absolute Risk Reduction (ARR): the decrease in event rate when the experimental treatment reduces the risk for a bad event
- Absolute Risk Increase (ARI): the increase in the rate of bad events when the experimental treatment harms more patients than the control treatment
- Number Needed to Treat (NNT): the number of patients who need to be treated to prevent one bad outcome
- Number Needed to Harm (NNH): the number of patients who need to be treated to cause one bad outcome
- Relative Risk Reduction (RRR): the percent reduction in events in the treated group compared to the control group
- Relative Risk (RR): the ratio of risk in the treated to the risk in the control group

One of the biggest challenges in practicing EBM is the application of evidence in clinical practice. The studies may not fit the individual patient. A segment of the population that is often not included in published studies is older adults. Older adults have a tendency to be frailer; have more comorbidities; take more medications; and have impairments in cognition, function, and/or mood. By understanding the principles of EBM, health care providers can appreciate the limitations of existing evidence as it applies to older adults but nevertheless facilitate shared decision making with their patients.

As decision making has shifted from opinion-based to evidence-based on the individual patient level, the practice of EBM is also being applied to larger health care issues. Evidence-based health care is a discipline that emphasizes evidence-based decision making about individual patients, groups of patients, or populations (Gray Muir, 2001). As described by Gray Muir, the demand for evidence-based health care has been influenced by four factors: an aging population, the development of new medical knowledge and technology, patient expectations, and professional expectations. When health services must be managed for groups of patients or populations, EBM improves decision making in the areas of policy, purchasing, and management. Gray Muir also discusses the evolution of health care management philosophy from doing things cheaper in the 1970s to "doing the right things right" in the 21st century. In this new approach, four different strategies are used: increasing the "good to harm" ratio, advocating for change in clinical practice, increasing the rate of change in clinical practice, and promoting research (Gray Muir, 2001).

Whether EBM is being used at the individual patient level or on the population scale, it is an approach that assists clinicians in decision making, developing critical appraisal skills, promoting life-long learning, and recognizing the need for well-designed studies.

There are limitations to the practice of EBM (Sackett et al., 1996). First, clinicians often complain they do not have the time to search and appraise the original research. The recent growth of well-respected "preassessed" evidence summaries addresses this concern. Second, when EBM was first described, it did not emphasize the components of clinical decision making. In response, this model has been updated to include these components. Third, EBM has been described as "cookbook" medicine. The EBM paradigm (i.e., clinical research, clinical state circumstances, and patient preferences and actions with clinical expertise overlapping all these areas), however, illustrates that clinical research only informs but does not replace clinical acumen.

HELEN FERNANDEZ

See also
Risk Assessment and Identification

Internet Resources

ACP Journal Club
http://www.acponline.org

Agency of Health Services Research (AHRQ) Evidence Reports
http://www.ahcpr.gov/clinic.epcix.htm

Centre for Evidence-Based Medicine
http://cebm.jr2.ox.ac.uk/

Clinical Evidence
http://www.clinicalevidence.org

Cochrane Collaboration
http://www.cochrane.org

Complementary and Alternative Medicine
http://www.jr2.ox.ac.uk/bandolier

Evidence-Based Nursing
http://ebn.bmjjournals.com

National Guideline Clearing House
http://www.guidelines.gov/index.asp

REFERENCES

Gray Muir, J. A. (2001). *Evidence-based health care: How to make health policy and management decisions* (2nd ed.). Edinburgh: Churchill Livingstone.

Guyatt, G., & Rennie, D. (2001). *User's guide to medical literature: Essentials of evidence-based clinical practice*. Chicago, IL: American Medical Association.

Haynes, R. B., Devereaux, P. J., & Guyatt, G. H. (2002). Clinical expertise in the era of evidence-based medicine and patient choice (Editorial). *American College of Physicians Journal Club*, *136*, A–11.

Sackett, D. L., Rosenberg, W. M., Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence-based medicine: What it is and what it isn't. *British Medical Journal*, *312*(702), 71–72.

Straus, S., I-Hong Hsu, S., Ball, C. M., & Phillips, R. S. (2002). *Evidence-based acute medicine*. Oxford: Oxford Medical Knowledge.

EXERCISE AND CARDIOVASCULAR RESPONSE

Cardiovascular disease is the leading cause of death in the United States. It is also a major cause of morbidity and accounts for a substantial number of hospitalizations and emergency-department visits (Hanna & Wenger, 2005; Wenger, Helmy, Patel,

& Lerakis, 2005). The 1995 prevalence of coronary artery disease in those older than 65 was 83 per 1,000 in men and 90 per 1,000 in women. Autopsy studies have shown that obstructive coronary artery disease was present in 50% of elderly women and 70% of elderly men (Williams et al., 2002). It is one of the major health care burdens in our aging population, making primary and secondary prevention of cardiovascular disease highly important. Most coronary atherosclerotic disease is related to hypertension, hyperlipidemia, diabetes mellitus, cigarette smoking, obesity, unhealthy diet, and physical inactivity. Inadequate physical activity is a major risk factor for development of coronary heart disease. The American Heart Association has published recommendations for the implementation of physical activity for the primary and secondary prevention of heart disease. In the INTERHEART study, lack of physical activity accounted for 12% of population attributable risk for a myocardial infarction (Yusuf et al., 2004).

Physiologic Effects of Exercise

The physiologic effects of exercise on the cardiovascular system vary with the type, intensity, and duration of exercise. Beneficial effects of habitual aerobic exercise include a lower resting heart rate, a higher stroke volume and cardiac output, increased capillary density in skeletal muscle, and myocardial hypertrophy resulting in more efficient and improved oxygen utilization. In addition, regular exercise curtails the age-related decline in aerobic capacity.

Cardiovascular Benefits of Exercise

Exercise has numerous cardiovascular benefits. It modifies and attenuates the major risk factors that lead to the development of coronary atherosclerosis such as hypertension, diabetes, and hyperlipidemia. It also encourages a healthier lifestyle; people who exercise are often more careful with their diet and are more likely to refrain from cigarette smoking.

Effect on blood pressure

Regular exercise reduces blood pressure. A meta-analysis of 54 studies evaluating the effect of exercise on blood pressure showed a mean reduction of systolic blood pressure by 3.84 and diastolic blood pressure by 2.58 mmHg (Whelton, Chin, Xin, He, 2002).

Effect on lipids

Exercise results in an improved lipid profile with an increase in the serum high-density lipoprotein (HDL) and a decrease in serum triglycerides (Kraus et al., 2002). The effect on serum low-density lipoprotein (LDL) and total cholesterol is variable, although a decrease is common.

Effect on diabetes mellitus

Exercise improves glucose tolerance and reduces insulin resistance. In patients with glucose intolerance, exercise is as effective as metformin in halting progression to diabetes mellitus (Diabetes Prevention Program Research Group, 2005). In addition, exercise improves endothelial function and autonomic response and has a favorable effect on the fibrinolytic system.

Effect on survival

Physical activity also improves survival. The benefit of low-intensity exercise (walking) was demonstrated in a study of the Honolulu Heart Program. Among retired elderly, nonsmoking men (ages 61 to 81), regular walking was associated with a lower overall mortality. Walking more than 2 miles per day compared to less than 1 mile caused a 50% reduction in mortality (Hakim et al., 1998). Another study of a larger cohort from the Honolulu Heart Program showed that walking was associated with a lower risk of coronary heart disease. The investigators also noted a direct relationship between the reduction of coronary heart disease risk and the distance walked but demonstrated a benefit to walking even 0.25 mile per day. This mortality benefit was also seen in the Harvard Alumni Study; men (mean age 58) who were involved in moderately vigorous activities (e.g., brisk walking, cycling, swimming) had a 23% lower risk of death (Sesso, Paffenbarger, & Lee, 2000). The risk of cardiovascular disease and physical inactivity was also noted in the 70,000 postmenopausal women in the Women's Health Initiative study.

Effect on quality of life

Exercise also results in an improvement in quality of life and sense of well-being. A study of exercise stress-testing in the elderly found that the workload achieved during treadmill testing was inversely related to nursing-home placement. For every 1 MET (standard metabolic equivalent) increase in workload, the likelihood of nursing-home placement decreased by 12%.

Noncardiac Benefits

Regular exercise also reduces the risk for developing cancer, decreases the incidence of depression and anxiety, and leads to a healthy musculoskeletal system.

Secondary Prevention

Exercise is also extremely important in the secondary prevention of coronary heart disease. A meta-analysis of cardiac-rehabilitation programs showed a significant reduction in all-cause mortality and cardiovascular mortality in patients with known coronary artery disease who engaged in moderate physical activity. A symptom-limited stress test may be recommended after coronary artery bypass surgery or myocardial infarction prior to the initiation of an exercise program to guide exercise prescription.

Exercise Prescription

There are limited data to guide recommendations regarding which specific exercise and what intensity and duration of physical activity provide the most cardiovascular benefit. Most experts recommend 30 to 60 minutes of aerobic exercise at least 4 to 5 days per week. If this is not an attainable goal, any exercise is probably beneficial. In addition to aerobic activity, resistance training should be a part of the exercise program. Resistance training improves muscle strength and function, increases flexibility, and prevents osteoporosis. Compared to aerobic exercise, however, resistance training has only a modest effect on attenuation of cardiac risk factors. Low-impact physical activity decreases exercise injury as elderly age. The intensity of physical activity should be gauged by individual conditioning. An individual who has been sedentary and wishes to start an exercise program should consult with a physician about the need for an exercise stress test prior to initiating an exercise regimen.

AKBAR H. KHAN
TAREK HELMY
NANETTE K. WENGER

See also
Deconditioning Prevention
Falls Prevention
Hip Fractures

Internet Resources
American Heart Association
http://www.americanheart.org/presenter.jhtml?identifier=9036

American Heart Association
http://www.justmove.org/home.cfm

Family physician exercise home page
http://www.familydoctor.org/059.xml

Mayo Clinic exercise and physical fitness home page
http://www.mayoclinic.com/health/fitness/SM99999

U.S. National Library of Medicine
http://www.nlm.nih.gov/medlineplus/exerciseandphysicalfitness.html

REFERENCES

Diabetes Prevention Program Research Group (2005). Role of insulin secretion and sensitivity in the evolution of type 2 diabetes in the diabetes prevention program: Effects of lifestyle intervention and metformin. *Diabetes*, *54*(8), 2404–2414.

Hakim, A. A., Petrovitch, H., Burchfiel, C. M., Ross, W., Rodriguez, B. L., White, L. R., et al. (1998). Effects of walking on mortality among nonsmoking retired men. *New England Journal of Medicine*, *338*, 94–99.

Hanna, I. R., & Wenger, N. K. (2005). Secondary prevention of coronary heart disease in elderly patients. *American Family Physician*, *71*, 289–296.

Kraus, W. E., Houmard, J. A, Duscha, B. D., Knetzger, K. J., Wharton, M. B., McCartney, J. S., et al. (2002). Effects of the amount and intensity of exercise on plasma lipoproteins. *New England Journal of Medicine*, *347*, 1483–1492.

Sesso, H. D., Paffenbarger, R. S., Jr., & Lee, I. M. (2000). Physical activity and coronary heart disease in men: The Harvard Alumni Health Study. *Circulation*, *102*, 975–980.

Wenger, N. K., Helmy, T., Patel, A. D., & Lerakis, S. (2005). Evidence-based management of coronary artery disease in the elderly: Current perspectives. *Medscape General Medicine*, *13*(7), 75.

Whelton, S. P., Chin, A, Xin, X, He, J. (2002). Effect of aerobic exercise on blood pressure: a meta-analysis of randomized, controlled trials. *Annals of Internal Medicine*, *136*: 493–503.

Williams, M. A., Fleg, J. L., Ades, P. A., Chaitman, B. R., Miller, N. H., Mohiuddin, S. M., et al. (2002). AHA Scientific Statement. Secondary prevention of coronary heart disease in the elderly (with emphasis on patients >75 years of age). *Circulation, 105,* 1735–1743.

Yusuf, S., Hawken, S., Ounpuu, S., Dans, T., Avezum, A., Lanas, F., et al. (2004). Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): Case-control study. *Lancet*, *364*, 937–952.

EYE CARE PROVIDERS

The need for eye care services increases significantly with aging. Virtually all persons older than 65 years of age require some type of corrective lenses to improve their visual performance at a distance, near, or both, and the prevalence of ocular disease rises substantially. Half of all seniors older than 74 have advanced cataracts, almost one third have age-related macular degeneration, and up to one-tenth have glaucoma (Lee & Coleman, 2004).

Studies have shown that the aged are underserved with regard to eye care, despite being at higher risk for sight-threatening eye conditions. Blindness and visual impairment are highly prevalent among the elderly, especially among nursing-home residents. A significant proportion of their visual impairment can be remedied by refractive correction, medical eye treatment, and cataract surgery. Much of the loss can be treated or prevented with appropriate eye care (Tielsch, Javitt, Coleman, & Sommer, 1995).

Eye care services in the United States are provided largely by two groups: ophthalmologists and optometrists. Although both professions are trained to provide eye care, these two groups have specific education, training, licensure, and reimbursement for eye care services.

Ophthalmologists

Ophthalmologists are medical doctors who specialize in the medical and surgical care of the eyes. Ophthalmology is 1 of 23 medical specialties certified by the American Board of Medical Specialties. All ophthalmologists complete 4 years of education in a medical school or college of osteopathic medicine, a 1-year internship, and 3 years of postgraduate medical and clinical training in ophthalmology, and they must pass written and oral examinations to practice as licensed ophthalmologists. Many ophthalmologists take a postresidency fellowship in a subspecialty area such as retina, cornea, and neuro-ophthalmology. Since 1992, board certification is limited to 10 years and must be renewed. In 2006, there were 117 approved ophthalmology hospital residency programs in the United States; 1,365 physicians were enrolled in 3-year residency programs (http://www.acgme.org/adspublic/reports/accredited_programs.asp). Approximately 500 board-certified ophthalmologists enter the field each year.

More than two-thirds of all ophthalmology residents are male. Approximately 15,000 board- certified ophthalmologists practice nationwide, most in or near large cities within large medical centers, and more than 90% in office-based settings. Of these ophthalmologists, 40% specialize in the cornea, retina, cataracts, and glaucoma. Substantial excesses in subspecialist ophthalmologists are likely to develop, given current training levels (Lee, Jackson, & Relles, 1998).

Ophthalmologists are the only practitioners trained to perform major ocular surgery. Ophthalmologists also treat ocular diseases and conduct basic vision examinations, including refractions. Increased patient enrollment in managed care, along with significant cuts in reimbursement by Medicare and other third-party payers, has driven many ophthalmologists to seek other sources of revenue, such as the dispensing of eyewear. Interest in laser surgery to correct nearsightedness, farsightedness, and astigmatism has stimulated an entirely new market for many ophthalmologists.

Optometrists

Optometrists, or doctors of optometry (OD), are independent health care professionals and are the major providers of primary eye care in America. Optometry practice is specifically defined by each state; thus, the scope of practice and licensure requirements vary from state to state. All states now authorize optometrists to use prescribed drugs to treat eye infections, allergies, inflammation, and glaucoma. Licensed optometrists must take specified courses, pass written examinations, and demonstrate clinical aptitude in order to have their licenses extended to use and prescribe pharmaceutical agents. These educational requirements are included in the current optometric curricula and licensing examinations, so new licensees automatically meet state requirements. Vision services developed primarily by optometrists benefit a significant number of elderly Americans with residual vision.

Optometric education consists of a minimum of 3 years of undergraduate study, followed by 4 years of professional training in a doctoral program at one of the 16 schools and colleges of optometry in the United States. All states except Nevada, New Mexico, and Oklahoma require optometric graduates to pass national boards administered by the National Board of Examiners in Optometry, and most states require graduates to pass state-administered practical examinations. Optometric postgraduate clinical residency programs are available in ocular disease, geriatric care, vision rehabilitation, contact-lens fitting, and pediatric care. All states have continuing education requirements for relicensure.

Historically, optometry was a profession dominated by White males. However, a growing interest in optometry by women and minorities, especially Asians, has contributed to a dramatic change in the demographic profile of optometrists. As of 1998, 33,045 optometrists were in active practice (Schoenman & Gardner, 1998), an average of more than 12 optometrists for every 100,000 people. Optometrists are in greater supply in the Midwest and West and, almost without exception, all states have more optometrists than ophthalmologists.

Two-thirds of all optometrists practice privately; one-fifth work for optical chains; and the rest are employed by HMOs, hospital clinics, ophthalmological practices, and the military (Soroka, Krumholz, Bennett, & The National Board of Examiners Conditions Domain Task Force, 2006).

Coverage and Reimbursement for Vision Services

Despite the overwhelming need for vision care among the elderly, Medicare coverage for eye examinations and eyeglasses is limited. Routine eye examinations and refraction are not covered, whether provided by an optometrist or an ophthalmologist. Medicare does not cover eye examinations for prescribing, fitting, or changing eyeglasses or contact lenses for refractive errors. Eye examinations are reimbursable only for patients with complaints or symptoms of an eye disease or injury. Medicare also covers glaucoma screening in those who are considered high risk.

Medical eye care for ocular diseases rendered by optometrists and ophthalmologists is a covered benefit under Medicare. Similarly, surgical eye care is covered. A major gap in coverage exists in the area of rehabilitative services. Reimbursement for low-vision aids and appliances is denied. Eyeglasses are not covered under Medicare, with the sole exception of those patients who undergo cataract surgery. However, for them, coverage is limited to a single pair of corrective eyeglasses per surgery per lifetime.

Two-thirds of all state Medicaid programs cover routine eye examinations and eyeglasses annually or biennially, even though it is considered an optional benefit. HMOs frequently offer additional benefits to Medicare patients at little or no extra cost, and eye care coverage is one of the more popular additions. Although few HMOs offer eyeglasses as a cost-free benefit, a number do offer ophthalmic materials with moderate co-payments or discounts (Soroka et al., 2006). Unlike most other care, which requires patients to visit a gatekeeper or primary care provider initially, most managed-care plans waive the referral requirement and allow direct access to an eye care provider (i.e., optometrist or opthalmologist). Some plans, however, may require patients to consult an optometrist before seeking ophthalmological care.

Editorial Staff

See also

Cataracts
Glaucomas
Low Vision
Vision Changes and Care

Internet Resources

American Academy of Ophthalmology
http://www.eyenet.org/

American Optometric Association
http://www.aoanet.org/

National Eye Institute
http://www.nei.nih.gov/

Medicare Coverage
http://www.medicare.gov/Coverage/Home.asp

REFERENCES

Lee, A. G., & Coleman, A. L. (2004). Research agenda-setting program for geriatric ophthalmology. *Journal of the American Geriatrics Society, 52*(3), 453.

Lee, P. P., Jackson, C. A., & Relles, D. A. (1998). Specialty distributions of ophthalmologists in the workforce. *Archives of Ophthalmology*, *116*(7), 917–920.

Schoenman, J., & Gardner, E. (1998). *Results of the first national census of optometrists*. New York: Project Hope, Center for Health Affairs.

Soroka, M., Krumholz, D., Bennett, A., & The National Board of Examiners Conditions Domain Task Force (2006). The practice of optometry: National Board of Examiners in Optometry survey of optometric patients. *Optometry & Vision Science*, *83*(9), E625–E636.

Tielsch, J. M., Javitt, J. C., Coleman, A., & Sommer, A. (1995). The prevalence of blindness and visual impairment among nursing home residents in Baltimore. *New England Journal of Medicine*, *332*(18), 1205–1209.

FALLS PREVENTION

What Is a Fall

A fall is “an incident in which a person suddenly and involuntarily comes to rest on the ground or other surface, with or without loss of consciousness” (American Geriatrics Society, British Geriatrics Society, American Association of Orthopaedic Surgeons, 2001). Important overlaps exist among falls, syncope, and various types of dizziness. It is also crucial to consider approaches to falls, immobility, bone fragility (i.e., osteoporosis), and resulting fractures together.

Why Falls Matter

Falls are problematic for individuals, families and caregivers, and the entire health economy. Approximately 35% of people older than age 65 fall every year, rising to 50% in females over 80 (American Geriatrics Society et al., 2006). Rates in hospitals and extended-care settings are as high as 13 falls per 1,000 bed days. (Oliver, et al., 2006). Falls account for up to 40% of emergency-room visits in persons older than 65 and are the 7th most common reason for hospital admission (American Geriatrics Society et al., 2006). They are also a major factor in precipitating admissions to extended-care facilities. In hospitals and nursing homes, falls constitute the most common adverse incident and often lead to concern, complaint, or litigation from patients and families (Oliver et al., 2006).

Up to 40% of falls result in injury, including fractures of hip, vertebra, humerus, wrist, and ankle (Kannus, Sievanen, Palvanen, Jarvinen, & Parkkarri, 2004). Fracture of the femur alone is pandemic in developing countries, with World Health Organization (WHO) estimates of more than 6 million fractures worldwide by 2030. Even with modern treatment, fractures of the proximal femur still carry a 30% 12-month mortality and very high physical and functional morbidity. Falls may also result in head injury, which can lead, in turn, to subdural hematoma. In frail older people with limited functional ability, even “trivial” soft-tissue injuries may be disabling. A “long lie” following a fall can lead to pressure damage, hypothermia, and fear. Falls also result in anxiety, loss of confidence, limitation of activities, caregiver stress, and institutionalization.

Why Falls Happen

Although falls may occur in ambulatory older people with no co-morbidities, they most commonly happen at home—increasingly so with age. They are usually the result of synergistic interaction between several physiological risk factors and causative pathologies—the physical environment and the older person’s own behavior and beliefs. Several studies have summarized risk factors for falling (American Geriatrics Society et al., 2006; Kannus et al., 2005; Oliver et al., 2006), but clinicians need a framework to ensure they consider all common reversible risk factors. One such framework is the Drugs and Alcohol, Age-Related Physiological Changes, Medical Causes, and Environmental Causes (DAME) classification.

- Drugs and Alcohol: Older people are more sensitive to the effects of drugs and are often on multiple medications for long-term conditions. The key “culprit drugs” for falls are either centrally sedating agents (i.e., sedative/hypnotics, opiates, anticonvulsants) or those that can precipitate postural hypotension, arrhythmia, or presyncope (e.g., antihypertensives, diuretics, antiarrhythmics, levodopa). The risk from several co-prescribed agents is cumulative. Alcohol use may lead to falls, as well.

- Age-related changes: Although it can be improved by resistance exercise, muscle strength declines by 30% to 40% between ages 30 and 80. Sway increases, reaction times, and reflexes decrease, visual problems accumulate (including field defects, worsening acuity, contrast, and depth perception), gait patterns change, and cognitive impairment increases. Baroreceptor reflex and cerebral autoregulation, which help maintain upright posture, detection, computation, and correction, are easily affected by acute illness, dehydration, and drugs. In Lifestyle factors such as insufficient exercise, calcium or vitamin D levels may also play a part, as well as the person's own beliefs and attitudes about risk, accepting falls prevention advice, and remaining active (Gillespie, Gillespie, Robertson, Lamb, & Cumming, 2003).
- Medical causes include any cause of gait instability or muscle weakness (e.g., cerebrovascular disease, Parkinsonism, cerebellar syndrome, neuropathy, myopathy, osteoarthritis, and foot disorder); any cause of presyncope or syncope (e.g., aortic outflow obstruction, arrhythmia, postural hypotension, vasovagal syncope, and carotid sinus hypersensitivity). Any acute or subacute medical illness (e.g., sepsis, metabolic disturbance, and carcinoma) may present with falls or immobility. Falls are especially common in persons with dementia or delirium.
- Environmental causes include inadequate footwear, unsuitable walking aids, poor ambient lighting levels or contrast between surfaces, loose mats, slippery surfaces, trailing cables, and difficult stairs or access.

How We Should Approach Patients Who Have Fallen

Older people frequently present to health care providers with falls or immobility. Any loss of function in an older person should be evaluated (American Geriatrics Society et al., 2006; Gillespie et al., 2003). A thorough history is especially important to determine frequency, circumstances, precipitants, and consequences of falls, as well as associated syncope or dizziness. The history and examination should focus on common reversible risk factors such as gait disturbance or medications listed previously. Pathology should be reversed whenever possible. If this is not possible, we may still optimize confidence or reduce the chance of a "long lie" (e.g., by assistive technology) or fracture (e.g., by bone strengthening, bone protection, or environmental changes). Practitioners and caregivers should focus on falls that occur during routine activities; those where there is loss of consciousness or no recollection; those associated with injury, hospitalization, or prolonged recumbancy; and persons with gait instability (i.e., those falls for which there is clear potential for intervention).

It is also crucial that persons with fractures are assessed for underlying falls risk and those with recurrent falls for underlying bone health and fracture risk (Kannus et al., 2005). For instance, older people with fragility fractures—who have started bone-strengthening agents will often refracture within months; fall prevention is key in secondary fracture prevention. Patients may come through orthopedic trauma services with inadequate consideration of their underlying predisposition to fall or bone health. Fracture risk is a composite of falls risk and bone fragility. In the same way, many patients with recurrent or poorly remembered falls may be suffering syncope. Services and approaches for falls, faints, (bone) fragility, and fractures in older people should be integrated.

A balance must be struck between maximizing safety and respecting the autonomy of cognitively intact individuals. This is especially important in hospital patients, where falls risk is an inevitable part of recovery from acute illness, or in extended care, where the autonomy should not be compromised by an excessively risk averse or custodial approach (Oliver et al., 2006).

The Evidence for Interventions

Interventions to prevent falls and fractures may be multifaceted or single and may be targeted at general at-risk groups or specific groups (Chang et al., 2004; Kannus et al., 2005). The evidence is currently much stronger for secondary prevention in people who have already fallen (American Geriatrics Society et al., 2006; Chang et al., 2004; Gillespie et al., 2003). Interventions usually have high internal validity for specific target populations, which does not necessarily confer external validity or effectiveness outside of closely supervised research trials. There is good evidence that population-based interventions should be group-specific, just as individual treatments are person-specific. Key risk factors targeted in successful interventions have been (1) lower-limb muscle strength, (2) balance, (3) medication withdrawal (especially psychotropics), (4) postural hypotension and syncope, (5) vision, (6) vitamin D deficiency, (7) physical environment, and (8) injury prevention (e.g., bone-strengthening drugs or hip protector pads). Multifaceted interventions often include assessment and treatment for some or all of these factors—sometimes combined with other approaches such as patient and caregiver education, assistive technology, comprehensive geriatric assessment, and nursing or medical review. Although such approaches make clinical sense, the contents of the "black box" varies, making it hard to determine which component has produced the greatest benefit.

The best evidence is for progressive strength-balance training in older women at risk of falls but able to adhere to the exercise regime (in one case, coupled with withdrawal of psychotropic medication). There has also been one positive trial of tai chi. Structured medical and occupational therapy assessment/intervention for patients attending emergency room following a fall has been effective in fall prevention as has structured multidisciplinary review and intervention for patients with falls living in their own homes. High-dose oral calcium and vitamin D (i.e., three studies) in institutionalized populations, and environmental assessment for home hazards may decrease risk of falling. There is some evidence on the effectiveness of investigation and treatment of syncope in fall prevention. There have been several trials of hip-protector pads (usually in long-term-care settings) and although early results were promising, both initial acceptance of and adherence to the devices is low, and metaanalysis does not show overall effect.

Several trials of multifaceted interventions in hospitals have shown moderate effects in reducing falls (although not fractures), although few have been of high quality or of randomized controlled trial (RCT) design. In nursing homes, more high-quality RCTs have been performed, some demonstrating significant reductions in falls (not fracture) rates from multifaceted interventions (Oliver et al., 2006). There is no evidence that the use of physical restraints or bedrails prevents injurious falls.

There are many gaps in the evidence base, including tests of single interventions (e.g., medication review, footwear, use of alarm devices), effectiveness of fall prevention in dementia, the role of assistive technology and environment, community or public health approaches to fall prevention, the repetition of trial findings outside their original validation setting, and their translation to different target groups or translation to "real life" effectiveness.

Can the Evidence Be Implemented in Real Life for Impacts on Whole Populations

Specialist assessment services could not meet the demand if all patients with recurrent or injurious falls were referred for assessment. Therefore, all professionals working in hospitals, primary care, and nursing or care facilities should be able to assess fall risk factors and take appropriate actions; referral for specialist assessment and investigation services should be reserved for more complex patients. Although fall prevention might ultimately save money in health and social care systems, this would be a medium-term gain. In the short term, investment is required in exercise programs, screening, medication review, and specialist assessment services.

David Oliver

See also

Balance
Environmental Modifications: Home and Institutional
Fractures
Gait Disturbances

Internet Resources

Cochrane review: Hip protectors, The Cochrane Library, Issue 4, Oxford.
http://www.thecochranelibrary.com

Queensland Falls Prevention Best Practice Guidelines
http://www.health.qld.gov.au/fallsprevention/best_practice/default.asp

Registered Nurses Association of Ontario, Prevention of falls and fall injuries in the older adult: Best practice guidelines.
http://www.rnao.org/bestpractices/PDF/BPG Falls rev05.PDF

UK National Institute for Clinical Excellence (NICE).
http://www.nice.org.uk

Welsh Assembly Bulletin, accidents and injuries, Issue 1 – Falls; March 2005.
http://www.cmo.wales.gov.uk/content/publications/research/bulletin-accidents-mar05-e.PDF

REFERENCES

American Geriatrics Society, British Geriatrics Society, American Association of Orthopaedic Surgeons Panel on Falls Prevention (2001). Guidelines for the prevention of falls in older persons. *Journal of the American Geriatrics Society*, *49*, 664–672.

Chang, J., Morton, S., Rubenstein, L., Mojica, W., Maglione, M., Suttorp, M., et al. (2004). Interventions for the prevention of falls in older adults: Systematic review and meta-analysis of randomised clinical trials. *British Medical Journal*, *328*, 680.

Gillespie, L. D., Gillespie, W. J., Robertson, M. C., Lamb, S. E., & Cumming, R.G., et al. (2003). Interventions for preventing falls in the elderly. *Cochrane Review*, Issue 2.

Kannus, P., Sievanen, H., Palvanen, M., Jarvinen, T., & Parkkarri, J. (2005). The prevention of falls and fall-related injuries. *Lancet*, *366*, 1885–1893.

Oliver, D., Connelly, J. B., Victor, C. R., Shaw, F. E., Whitehead, P. A., Genc, Y., et al. (2006). Strategies to prevent falls and fractures in hospitals and care homes and effect of cognitive impairment: Systematic review and meta-analyses. *British Medical Journal*, available on-line at http://www.bmj.com/cgi/content/abstract/bmj.39049.706493.55v1

FAMILY CARE FOR ELDERS WITH DEMENTIA

Although many issues are important in understanding the needs of family caregivers of patients with dementia, three are key: (1) the importance of early diagnosis and prognosis, (2) common problems associated with memory loss that families find difficult to cope with, and (3) the family's emotional needs throughout the caregiving experience.

Early Diagnosis and Prognosis

With early diagnosis, it may be possible to begin treatment that can slow the cognitive decline while there is still minimal impairment. Most important for family members is that early diagnosis allows the patient and family time to plan for future needs, such as executing a power of attorney and appointing a health care representative. Family members often fear that after the diagnosis, the physician will abandon them. It is essential that physicians convey to the family that they will continue to be involved with the patient and family and that management issues will be reviewed as they arise (Boustani et al., 2005; Hendrie, Unverzagt, & Austrom, 1997). Health care providers should also educate the patient and the family regarding disease progression and prognosis, provide support, and monitor judgment and safety issues so that the patient can remain independent or community-dwelling as long as possible (Richards & Hendrie, 1999; Schulz, 2000).

Common Problems Associated With Memory Loss

Unlike other illnesses, dementia has the additional problem of memory loss. Most family caregivers have difficulty providing care simply because they do not understand what is happening to the patient in the early stages of the disease, nor do they know how to respond appropriately to changes in the patient's behavior. The accompanying table describes some of the most common problems associated with memory loss and how caregivers should respond.

One of the most important things for family caregivers to remember is that a patient diagnosed with dementia does not behave in these ways intentionally. These behaviors are manifestations of a brain disorder, and caregivers should not take personally anything the patient says or does. This can help avoid conflict, anger, and subsequent feelings of guilt. Patients cannot be held responsible for their behaviors, but all behavior has a purpose. It is up to the caregiver to look for that underlying purpose. For example, a patient may be agitated and wander around the house because he has forgotten where the bathroom is and he needs to use it. Or a patient may constantly disrobe because she is too hot. The caregiver should not blame the patient for these behaviors but should remain calm, try to figure out what is causing the behavior, and redirect the patient while protecting his or her dignity.

The Family's Emotional Response to Dementia

A patient with dementia may need care for many years. Successful caregiving is based on understanding the caregiver's emotional response to the disease, to the patient, and to the patient's behaviors, which change over time. Families must endure an ongoing grief process as they strive to cope with the demands of caregiving while watching the psychological death of their loved one and the death of that individual's personality—that quality or assemblage of qualities that makes a person who he or she is. Unfortunately, many caregiving families fail to realize that *grief* is an appropriate response when caring for a patient with dementia (Austrom & Hendrie, 1990).

Denial is a common response when confronted with emotionally difficult information, such as the diagnosis of dementia. Although early denial may lessen the emotional impact of the diagnosis, continued denial is counterproductive. It may foster unrealistic expectations about the patient's capabilities and interferes with appropriate planning for the future. Clinicians should recognize that denial and disbelief are common when caregivers first learn about the diagnosis. Families will need a second opportunity to review the information with the clinician.

Anger is commonly experienced by caregiving families that must provide long-term care. Sometimes this anger is directed at the patient. Often, families are angry with the government or the health care system. The cost of long-term care can be devastating to middle-income families, shattering their plans for retirement. Anger may also be directed at other family members for not understanding the toll that caregiving takes and for criticizing their efforts. Family members who do not live with the patient and have not had to provide constant care may not appreciate the extent of the demands placed on the caregiver and may offer suggestions about how to provide better care. Conflicts among family members are not unusual, and relationships are further strained when they cannot agree on the patient's care. Old resentments may resurface and interfere with sensible problem solving. The decision whether to institutionalize the patient often exacerbates these family conflicts and associated guilt (Austrom & Hendrie, 1990).

The emotions of *anger* and *guilt* are often intertwined. Family members may experience guilt for many reasons: not being attentive enough to the patient before the illness, unresolved past conflicts, or making decisions to which the patient objects. Some feelings of guilt may be a normal reaction to feelings of anger or wishes that the demented patient would die. When the patient finally dies, bereavement reactions are often mixed with relief that it is finally over and guilt for having wished that it would end (Austrom & Hendrie, 1990). It is important that caregivers know that such mixed emotions are both understandable and common. One study has demonstrated that counseling and support provided to the family caregiver resulted in improved spouse-caregiver well-being, improved support from family and friends, reduced the caregiver's reactions to patient behavior, prevented increasing caregiver depression, improved the caregiver's physical health, and helped spouse-caregivers keep patients at home longer (Mittelman, Roth, Coon, & Haley, 2004).

When dealing with patients with dementia, family caregivers face the progressive deterioration of the patient's higher mental functions, the behavioral problems associated with the disease, the financial burden, the eventual institutionalization of the patient, and the grief associated with the loss of the patient as he or she had once been. Caregivers must take the necessary time to deal with their own emotions so that they can continue to function effectively as caregivers. Health care professionals, who should provide appropriate long-term support to these families, rarely recognize this massive burden. In a recent major study, however, it was demonstrated that the key principles of management described herein can indeed be implemented in a primary care setting and is associated with a highly significant reduction in behavioral and psychological symptoms in Alzheimer's disease (AD) patients with minimal use of psychotropic drugs, effectively reducing caregiver stress and increasing caregiver skills. This type of multidisciplinary care management may serve as a model for effective AD patient and caregiver management in primary care (Callahan et al., 2006).

Mary Guerriero Austrom
Hugh C. Hendrie

Acknowledgment
This work was supported in part by NIA Grant No. P30AG10133.

See also

Caregiver Burden
Caregiver Burnout
Dementia: Overview
Family Care for Frail Elders
Social Supports (Formal and Informal)

Internet Resources

The Alzheimer's Association
http://www.alz.org/overview.asp

Family Caregiver Alliance—National Center on Caregiving
http://www.caregiver.org

REFERENCES

Austrom, M. G., & Hendrie, H. C. (1990). Death of the personality: The grief response of the Alzheimer's disease family caregiver. *The American Journal of Alzheimer's Care and Related Disorders & Research*, *2*, 16–27.

Boustani, M., Callahan, C. M., Unverzagt, F. W., Austrom, M. G., Perkins, A. J., Fultz, B. A., et al. (2005). Implementing a screening and diagnosis program for dementia in primary care. *Journal of General Internal Medicine*, *20*(7), 572–577.

Callahan, C. M., Boustani, M. A., Unverzagt, F. W., Austrom, M. G., Damush, T. M, Perkins, A. J., et al. (2006). Effectiveness of collaborative care for older adults with Alzheimer disease in primary care: A randomized controlled trial. *Journal of the American Medical Association*, *295*(18), 2148–2157.

Hendrie, H. C., Unverzagt, F. W., and Austrom, M. G. (1997). The dementing disorders. *Psychiatric Quarterly*, *68*(3), 261–279.

Mittelman, M. S., Roth, D. L., Coon, D. W., & Haley, W. E. (2004). Sustained benefit of supportive intervention for depressive symptoms in caregivers of patients with Alzheimer's disease. *American Journal of Psychiatry*, *161*(5), 850–856.

Richards, S., & Hendrie, H. C. (1999). Diagnosis, management, and treatment of Alzheimer disease. *Archives of Internal Medicine*, *159*, 789–798.

Schulz, R. (Ed.) (2000). *Handbook on Dementia Caregiving*. New York: Springer Publishing.

FAMILY CARE FOR FRAIL ELDERS

Aging, chronic disease, and functional decline woven together create frail elders. For many of these elders, living alone or moving to an institutional setting (i.e., assisted-living facility, continuing-care community, nursing home) is the ultimate indicator of frailty and decline. However, moving into a long-term-care (LTC) facility also is a financial impracticality for the majority of persons age 65, who often spend more than a third of their income on health care needs. Thus, for frail elders who seek to remain in their own home, their families will provide 80% or more of their in-home care (NAC-AARP, 2004). Whereas social norms make elder-kin care a family expectation, interventions that aid families in

TABLE F.1 Common Problems Associated with Memory Loss

PROBLEM	COMMON RESPONSE	CORRECT RESPONSE
Is unaware of memory loss or denies it.	Patient should remember. Why won't he face it?	Patient cannot remember that he cannot remember. He is not doing this intentionally.
Memory fluctuates from day to day.	Patient is not trying. She remembers only what she wants to remember.	Some fluctuation in memory is normal. Take advantage of the "good" days.
Asks repetitive questions.	Patient is doing this to annoy me. I have answered him 10 times already. He can control this.	Patient cannot remember asking. Patient no longer knows how to ask for attention.
Makes accusations (e.g., stealing).	Patient is crazy. No one is stealing her possessions.	This is a way for the patient to deal with the insecurity caused by not being able to remember.
Won't bathe; becomes agitated and violent about it.	Patient knows that it is important to shower every day.	Patient cannot remember all the steps necessary to shower or gets confused in the bathroom. It is embarrassing for him to ask for help. It is not critical to shower every day.
Insists on driving, although it is obvious that she has trouble behind the wheel.	Ignore it and hope that nothing bad happens. Rationally try to explain that driving is dangerous.	Enlist professional help, for example, a physician, lawyer, or insurance agent.
Lowered inhibitions.	Patient should be able to control himself. He knows he should be dressed to go outside.	This is a symptom of the disease. The patient cannot help it. He is not doing it to embarrass me.

care are seldom discussed in the literature. Strategies for working with families who are the major home care providers for elders with physical and emotional frailties are discussed herein.

The Challenge of Physical Frailty

Physically frail elders are those with lower-extremity weakness, gait and balance disorders, previous falls, functional impairment, visual deficits, cognitive impairment, depression, poly-pharmacy self-medication habits, and/or incontinence. Falls, broken bones, and incontinence are major risks for institutionalization of these physically frail elders (Friedman, Steinwachs, Rathouz, Burton, & Mukamel, 2005).

Families expect to assist aged kin with physical care and most families readily take on intimate aspects of bathing, dressing, eating, transferring, and even toileting for a frail elder. Over the past decade, a variety of studies have indicated that with training and support, families can successfully take on complex physical-care tasks associated with managing incontinence, parentral nutrition, and even managing dementia-related behavioral problems. To accomplish physical-care tasks, families need psycho-educational interventions that include illness-specific information, direct-care skill training, ongoing support and, on occasion, respite (Pinquart & Sorensen, 2005).

Advance Directives

Although accepting physical care from their family can be stressful for frail elders, and mastering intimate physical-care tasks may require training and support for families, a greater challenge for families may be around end-of-life care for frail elders. Whereas the 1990 Patient Self-Determination

Act ensures that hospitalized patients have the opportunity to participate in treatment decisions, this legislature does not extend into home care situations. Advance directives–written documents clarifying what should be done if and when the elder is incapacitated and unable to voice his or her personal wishes about care—can clarify care decisions for professional service providers as well as elders and their families. Because many families have a difficult time discussing end-of-life decision making with elder kin, health professionals should include opportunities for elders and their families to discuss and formulate advance directives.

The Challenges of Emotional Frailty

An equally challenging issue in family caregiving is around emotional frailties that stem from negative moods and depressive affect. Elders are at high risk for depression because of the cascade of personal losses (of family members and friends) that often characterize aging. Four factors reportedly predict high levels of depressive symptoms: bereavement, sleep disturbance, disability, and prior depression. Depression and cognitive decline are frequent correlates in aging and depressive symptoms often are mistakenly diagnosed as the early onset of dementing illness. However, depressive symptoms are not always associated with cognitive decline. An estimated 2 million Americans age 65 and older have a depressive illness; another 5 million have depressive symptoms. Whereas older women are more apt to report depressive symptoms, older men are more likely to act on those symptoms, and White males age 85 and older have the highest risk of suicide in the United States—five times the rate of other age groups (NIMH, 2003). The emotional frailty that comes with depression is particularly challenging for families to manage, in part because it is not possible to reverse the physical, social, and emotional losses of aging.

Recent research findings indicated that increasing pleasant daily life events and social involvement can reduce depressive symptoms and enhance cognitive well-being in frail elders (Teri, McCurry, Logsdon, & Gibbons, 2005). Thus, a second form of family assistance around care of a frail elder is interventions that help families increase the elder's daily involvement in some of life's *simple pleasures* such as listening to music, getting out of the house, visiting with friends and family, and participating in similar social activities that enhance mood and improve positive affect.

Strategies for Helping Families of Frail Elders

Under the auspices of the Older Americans Act, the National Family Caregiver Support Program (NFCSP) distributes funds to states for programs that offer family caregivers counseling, training, support groups, respite care, and informational programs. As of 2004, there were 655 Area Agencies on Aging around the country. Through these funds, some states have begun experimenting with family-caregiver reimbursement programs. Although few in number, early findings from a pilot test of this reimbursement program in Arkansas (Dale, Brown, & Phillips, 2004) indicate a combination of community-based services and care stipends for family caregivers may be the best answer for long-term frail elder care in the home. Three additional strategies can be helpful for working with families with a frail elder in the home.

Help Families Find Meaning in Elder Care

Research findings over the past decade indicate that caregivers who are able to find positive meaning in caregiving are more likely to successfully manage the challenges of long-term elder care. Sessions that include discussion of both family members' caregiving feelings and concerns as well as elders physical and emotional frailties provide opportunities for finding family meaning in elder care.

Foster Transitional Care Planning

Family care plans for elders can and should evolve over time, as elder needs and family resources change. Families need information on direct-care training opportunities, available through Area Agency on Aging centers, Red Cross classes, church- and synagogue-sponsored family programs, as well as lists of community resources (e.g., location and telephone numbers of elder day care settings, contact information for local family support group leaders, respite care, and emergency services). Helping families to view care planning as transitional situations that often will include some degree of uncertainty can be helpful when frail elder needs and family resources change. Families who are successful in caring for frail elders likely are those who can make decisions during periods of uncertainty. For some families, managing those periods of uncertainty is aided by readily accessible professional support and encouragement.

Acknowledge Family Caregiving Conflicts

Although kin care is an expected norm, the onset of elder care often generates interfamilial stress as the elder experiences progressive decline in independent function over time or an unexpected health crisis such as a fall, broken bone, or a cardiac episode requires family members to take on new roles and responsibilities, often for an uncertain period. Numerous studies indicate that family conflicts around caregiving within families and between family members and health care providers are common. In working with caregiving families, it can be helpful to mention the problems that other families have successfully resolved such as competing time demands, uncertainty about who will provide specific care services, where to get information and aid, how to deal with emergencies, and so forth. When conflicts occur, encouraging individual family members to verbalize concerns can open the way for discussion of differing views. In family conferences, the use of reflexive questions, such as "How could the family manage this issue?" can help families begin conjoint problem solving around care conflicts.

In summary, families can be challenged by elder-kin situations that require mastery of complex direct-physical-care skills and decision making, as well as elder support to offset the emotional frailties that characterize aging. Strong intrafamilial ties, as well as social norms for family unity around kin responsibilities, provide compelling incentives for families to provide this care. Health care providers who work with families can facilitate both elder-care quality and family unity by helping families find meaning and purpose in care, by developing and refining transitional care plans, and by supporting families through the conflicts that often challenge families as the primary home caregivers of frail elders.

LINDA LINDSEY DAVIS
DEBORAH CHESTNUTT

See also
Caregiver Burden
Caregiving Relationships
Elder Neglect
Elder Mistreatment: Overview
Family Caregiver Needs: Assessment

Internet Resources
Family Caregiver Alliance
http://www.caregiver.org

National Alliance for Caregiving
http://www.caregiving.org

The National Family Caregivers Association
http://www.nfcacares.org/

REFERENCES

Dale, S., Brown, R., & Phillips, B. (2004). *Does Arkansas' cash and counseling affect service use and public costs?* Washington, DC: Mathematica Policy Research, Inc. Report to the U.S. Department of Health and Human Services.

Friedman, S., Steinwachs, D., Rathouz, P., Burton, L., & Mukamel, D. (2005). Characteristics predicting nursing home admission in the program of all-inclusive care for elderly people. *Gerontologist*, *45*(2), 157–166.

NAC-AARP (2004). *Caregiving in the U.S.* Bethesda, MD.

NIMH (2003). *Older adults: Depression and suicide facts*. Available at http://www.nimh.nih.gov/publicat/elderlydepsuicide.cfm

Pinquart, M., & Sorensen, S. (2005). Ethnic differences in stressors, resources, and psychological outcomes of family caregiving: A meta-analysis. *The Gerontologist*, *45(*1), 90–106.

Teri, L., McCurry, S., Logsdon, R., & Gibbons, L. (2005). Training community consultants to help family members improve dementia care: A randomized controlled trial. The *Gerontologist*, *45*(6), 802–811.

FAMILY CAREGIVER NEEDS: ASSESSMENT

With the dramatic demographic shift to an aging population, the challenges of family care are an increasing reality of daily life for America's families. Family caregivers often undertake caregiving willingly and as a source of great personal satisfaction. However, caregiving can exact a high cost while caring for an older family member who is chronically ill or experiencing an acute phase of an illness. A body of research has shown that families commonly face health risks, financial burdens, emotional strain, mental health problems, workplace issues, retirement insecurity, and lost opportunities. Although family caregivers are the major providers of long-term care, the significance of their role and their own burdens and compromised health are often overlooked. This discussion is about the central importance and value of systematic assessment of family caregivers' own needs and provides fundamental principles and basic guidelines for conducting caregiver assessment in a variety of settings.

What Is Caregiver Assessment?

The term *caregiver assessment* is generally used to describe a systematic process of gathering information about a caregiving situation and identifying the particular problems, needs, resources, and strengths of the family caregiver. It approaches issues from the caregiver's perspective and culture, focuses on what assistance the caregiver may need, and seeks to maintain the caregiver's own health and well-being. The goal of the caregiver assessment is to develop a care plan that indicates appropriate provision of services and supports for the family caregiver and any measurable outcomes of such services. The assessment process is intended to help the person in need of care and the family providing the care achieve the best possible quality of life in accordance with their values, needs, resources, and preferences (Family Caregiver Alliance, 2006).

Why Assess Family Caregivers?

In long-term care, it is of central importance to meet the needs and preserve the dignity and autonomy of the older person needing care. It is also important to recognize, respect, assess, and address the needs of the family caregiver that result from the caregiving role. This family-centered approach views family caregivers as a core part of health care and long-term care, recognizes the interconnectedness of older people and their family caregivers, facilitates continuity of care, and respects the values and preferences of the individuals assessed (Feinberg, Wolkwitz, & Goldstein, 2006).

Conducting a systematic assessment of the caregiver's needs captures information on the caregiver's everyday experience and legitimizes the process of listening to and directly supporting the family caregivers themselves, as distinct from but related to the needs of the frail elder. Often, an assessment can be a first step toward helping caregivers obtain the information and services they need to maintain their own health and well-being in the face of caregiving tasks before them (Bradley, 2003).

Caregiver assessment is the key to care planning. Identifying service needs and unresolved problems is fundamental to a plan that supports and strengthens the family as a whole, where most care is given and received. The success of most care plans, from hospital discharge to everyday care in the home, often rests on the shoulders of the family caregiver. If the caregiver becomes ill or can no longer cope with caregiving tasks, the frail elder suffers. Caregiver strain and health risks can impede the caregiver's ability to provide care, lead to higher health care costs, and affect the quality of life for caregivers and those for whom they care. If the physical, emotional, and financial strains on the caregiver become too great, care in the home can be seriously jeopardized and can lead to nursing-home placement (Buhr, Kuchibhatla, & Clipp, 2006). Therefore, effective outcomes in home, hospitals, and community settings depend on knowing the needs and risks of both the frail elder and the family caregiver.

What Should a Family Caregiver Assessment Include?

Caregiver assessment should result in a plan of care that is developed collaboratively with the caregiver and that indicates the provision of services and intended measurable outcomes. It should embrace a family-centered perspective, inclusive of the needs and preferences of both the care recipient and the caregiver. Caregiver assessment should also be multidimensional in approach and periodically updated. Caregiving is complex—it embraces varied tasks (e.g., locating, accessing, and coordinating services; filling out forms; managing medications; and providing direct care, including bathing and dressing) and has multiple impacts. Clinical decision making and professional judgment require an understanding of the total context of family care through an assessment of multiple domains. Periodic reassessment to assess change over time and modify the plan of care is a crucial component of a systematic assessment process. Wherever possible, established measures in an assessment tool should be (1) practical and applicable to family caregivers; (2) previously applied, or could be adapted for use in a service setting; (3) reliable and valid; and (4) cited in the professional literature.

The assessment approach and content of an assessment tool should be tailored to the service setting and context—that is, the focus of the intervention. For example, if an agency is trying to help an adult daughter improve her behavior-management skills in caring for her father who has Alzheimer's disease, the assessment should include measures that would show changes in the daughter's behavior-management skills rather than changes in, say, life satisfaction. Similarly, if the goal or desired outcome of a program is to enhance a husband's knowledge of the caregiving role and the nature and course of his wife's illness, the assessment would look at changes in what the husband knows about the caregiver role and the disease or condition, not changes in the husband's economic strain, for example, because the program could be expected to have little direct effect on the financial impact of caregiving.

Although the content of a caregiver assessment should be determined by the focus of the service intervention (Bass, 2002), any caregiver assessment should:

- identify the primary caregiver and other family and friends who are involved in arranging, coordinating, and providing care
- approach issues from the caregiver's perspective
- improve caregivers' understanding of their role and what they need to know to carry out tasks
- give practitioners information to develop a care plan with measurable outcomes for caregivers
- address services available for the caregiver and provide appropriate and timely referral for services
- be no longer than necessary (Family Caregiver Alliance, 2006)

Experts in serving caregivers and researchers who participated in the 2005 National Consensus Project for Caregiver Assessment (Family Caregiver Alliance, 2006) recommend seven categories of information (i.e., the domains or content area) to include in a caregiver assessment.

Context

That is, the background on the caregiver and the caregiving situation. What is the caregiver's relationship to the care recipient? How long has he or she been in the caregiving role? Is the caregiver currently employed?

Caregiver's Perception

Caregiver's Perception of health and functional status of care recipient. Can the care recipient carry out activities of daily living (ADLs) without assistance, such as bathing or dressing? Can the care recipient carry out instrumental activities of daily living (IADLs) without assistance such as managing finances or using the telephone? Does the care recipient have any behavioral problems, such as wandering, how frequently do they occur, and how much do they bother or upset the caregiver when they happen?

Caregiver Values and Preferences

Caregiver Values and Preferences with respect to everyday living and care provision. Is the caregiver willing to assume the caregiver role? What types of care arrangements are considered culturally acceptable for this family?

Well-being of the Caregiver

How does the caregiver rate his or her own health? How often does the caregiver feel anxious or angry when he or she is around the care recipient?

Consequences of Caregiving

Consequences of Caregiving both perceived challenges and perceived benefits. Does the caregiver suffer any work-related difficulties due to the caregiving role? How much does the caregiver's health stand in the way of doing things he or she wants to do? Does the caregiver feel satisfaction in helping a family member?

Caregiver Skills/Abilities/Knowledge to Provide Care

How knowledgeable does the caregiver feel about the care recipient's condition? What are the skills and abilities needed to provide care? How confident and competent does the caregiver feel in these areas?

Caregiver resources

What are the caregiver's coping strategies? What is going well? What other community resources or services is the caregiver utilizing or aware of, such as caregiver support groups, religious organizations?

Who Should Conduct Caregiver Assessments?

Various health and social service professionals can conduct a caregiver assessment, including physicians, social workers, care managers, nurses, and rehabilitation professionals (e.g., occupational therapists). To conduct effective assessments, professionals need to have specialized knowledge and skills and an understanding of how the assessment process guides and informs their work with the family. Training should include an understanding of the caregiving process and its impacts, as well as the benefits and elements of an effective caregiver assessment. Caregiver assessment allows family caregivers to "tell their stories" and to describe their particular situation. However, assessment is only a tool, not an end in itself. For assessment to be meaningful, the conversation with the caregiver and the information collected must be valued by the practitioner and linked to a care plan that is developed collaboratively with the caregiver.

When conducting a caregiver assessment, it is important to recognize that families are increasingly diverse. Because cultural, ethnic, and religious influences help define family roles and affect the use of support services, caregiver assessments should reflect culturally competent practice.

In summary, systematic assessment of family caregiver needs is an essential component of working with older people. This family-centered approach empowers family caregivers to make informed decisions, links caregivers with community services, and can improve quality of care.

LYNN FRISS FEINBERG
CARA GOLDSTEIN

See also

Caregiver Burden
Caregiver Burnout
Caregiving Relationships

Family Care for Frail Elders
Multidimensional Functional Assessment: Overview

Internet Resources

Administration on Aging, National Family Caregiver Support Program (NFCSP)
http://www.aoa.gov/prof/aoaprog/caregiver/careprof/progguidance/resources/tools_programming.asp

Aging and Disability Resource Center, Technical Assistance Exchange Assessment Tools Matrix
http://www.adrc-tae.org/tiki-index.php?page=AssessmentToolsMatrixPublic

American Medical Association, Caregiver Self-Assessment Tool
http://www.ama-assn.org/ama/pub/category/5037.html

Family Caregiver Alliance, A Toolkit to Help Practitioners Assess the Needs of Family Caregivers
http://www.caregiver.org/caregiver/jsp/content_node.jsp?nodeid=1695

Family Caregiver Alliance, Selected Caregiver Assessment Measures: A Resource Inventory for Practitioners
http://www.caregiver.org/caregiver/jsp/content_node.jsp?nodeid=470

REFERENCES

Bass, D. (2002). *Content and implementation of a caregiver assessment (Issue Brief)*. Washington, DC: Administration on Aging.

Bradley, P. (2003). Family caregiver assessment: Essential for effective home health care. *Journal of Gerontological Nursing*, *29*, 29–36.

Buhr, G. T., Kuchibhatla, M., & Clipp, E. (2006). Caregivers' reasons for nursing home placement: cues for improving discussions with families prior to the transition. *The Gerontologist*, *46*(1), 52–61.

Family Caregiver Alliance (2006). *Caregiver assessment: Principles, guidelines and strategies for change. Report from a National Consensus Development Conference (Vol. I)*. San Francisco.

Family Caregiver Alliance (2006). *Caregiver assessment: Voices and views from the field. Report from a National Consensus Development Conference (Vol. II)*. San Francisco.

Family Caregiver Alliance (2006). *Caregivers count too! A toolkit to help practitioners in assessing the needs of family caregivers*. San Francisco.

Feinberg, L. F., Wolkwitz, K., & Goldstein, C. (2006). *Ahead of the curve: Emerging trends and practices in family caregiver support*. Washington, DC: AARP Public Policy Institute.

FATIGUE

Fatigue, which is one of the most common complaints in general medical practice, is usually defined as an abnormal state of physical or mental exhaustion (Gallagher, Thomas, Hamilton, & White, 2004). It is seen more commonly in the elderly patients than their younger counterparts. Etiology of fatigue also varies by age. In younger patients, it is more commonly due to sleep deprivation, lack of rest, overactivity, and stress; in older patient, chronic illnesses and medications are usually implicated. Fatigue can significantly diminish one's quality of life by interfering with daily activities. Many conditions that result in fatigue are treatable once the correct diagnosis is made.

Although fatigue is a relatively common symptom in the elderly, it often escapes the attention of physicians. Patients usually either ignore their symptoms or accept them as an inevitable part of aging. Often, the caregiver rather than the patient reports this complaint, especially in cognitively impaired patients. In many cases, it is appropriate for the physician to inquire about it (Pouri, Mores, Cook, Findley, & Cristian, 2005).

Causes

The causes of chronic fatigue in elderly individuals are numerous and include chronic inflammatory conditions (e.g., systemic lupus erythematosus, rheumatoid and osteoarthritides, polymyalgia rheumatica, temporal arteritis, inflammatory bowel disease, dermatomyositis, polymyositis); infections (e.g., tuberculosis, hepatitis, endocarditis, Lyme disease, human immunodeficiency virus, infectious mononucleosis); malignancy (e.g., colon cancer, breast cancer, lung cancer, renal cell cancer, leukemia, lymphoma, multiple myeloma); endocrinopathies (e.g., hyperthyroidism, hypothyroidism, pituitary insufficiency, adrenal insufficiency, uncontrolled diabetes); cardiovascular diseases (e.g., congestive heart failure, valvular heart disease); neurological diseases (e.g., Parkinson's disease, narcolepsy, amyotrophic lateral sclerosis, myasthenia gravis, Eaton-Lambert syndrome); anemia of various causes (e.g., chronic occult blood loss, folate and vitamin B_{12} deficiency); hypoxia (e.g., chronic obstructive pulmonary disease, interstitial pulmonary fibrosis, obstructive sleep apnea); psychiatric disorders (e.g., depression, dysthymia, anxiety, somatization, alcoholism); alcohol; chronic pain (may also cause insomnia); disuse and immobility (e.g., general inactivity, prolonged bedrest, deconditioning); lifestyle issues (e.g, inadequate rest, inadequate sleep, excessive exercise, boredom); environmental causes (e.g., noise, high ambient temperature, uncomfortable furniture, exposure to heavy metals or carbon monoxide); and medications (e.g., corticosteroids, chemotherapy drugs, nonsteroidal anti-inflammatory drugs, centrally acting antihypertensives, many beta-blockers, anticonvulsants, some antidepressants, antihistamines, sedatives, tranquilizers). Some medications may cause symptoms if their levels are high (Matthews, Manu, & Lane, 1991).

Chronic fatigue syndrome that typically presents with low-grade fever, myalgias, painful shotty lymphadenopathy, depression, and difficulty concentrating is usually seen in younger women and is rarely found in the elderly (Gallagher, Thomas, Hamilton, & White, 2004).

Assessment

History

The clinician must take a careful history to determine the cause of fatigue. It is best to ask patients to define their meaning of fatigue. For example, patients may complain of being weak, tired, or unable to concentrate. Other patients may describe boredom, daytime sleepiness, or exertional fatigue. Asking patients to elaborate on their symptoms may lead directly to a correct diagnosis. The onset and duration, progression over time, and provoking and alleviating factors should also be noted.

Past medical history and habits such as diet; sleep; exercise; and caffeine, alcohol, and nicotine use must be elicited, as should a list of all prescription and over-the-counter (OTC) medications. Thorough review of systems will identify localizing symptoms and signs that would guide further evaluation.

It is also important to inquire about associated symptoms. For instance, fatigue accompanied by shortness of breath, especially on exertion, may indicate underlying coronary artery disease, asthma, or intrinsic lung disease. Weight loss may be a sign of malignancy or depression. The presence of fever may be the only sign of tuberculosis, endocarditis, temporal arteritis, and polymyalgia rheumatica. Fatigued patients with daytime somnolence and a history of snoring may suffer from obstructive sleep apnea. Temporal arteritis can present with symptoms of jaw claudication, temporal or generalized headache, and extreme weakness, to the extent that the patient is unable to get out of bed (Matthews, Manu, & Lane, 1991).

The presence of vegetative signs such as depressed mood, poor appetite, and insomnia point to mood disorders as the cause for fatigue. Mood, anxiety, and somatization disorders are common in patients with chronic fatigue but are often undiagnosed. They often coexist with medical disorders. Psychiatric evaluation is indicated when these conditions are suspected or when no diagnosis can be made after the medical evaluation is completed (Matthews, Manu, & Lane, 1991).

Physical Examination

A complete physical exam focuses on the presence or absence of fever, rash, pallor, thyroid enlargement, elevated or decreased heart rate, rales, lymphadenopathy, hepatosplenomegaly, and neurological deficits. Muscle bulk, tone, and strength should be tested to rule out a neuromuscular disease. Temporal artery palpation and a joint exam are helpful in detecting rheumatological conditions. Sometimes the general appearance of the patient, such as poor grooming, psychomotor agitation, or depressed affect, suggests the existence of a psychiatric disorder (Matthews, Manu, & Lane, 1991).

Laboratory Tests

Routine screening tests include complete blood count, electrolytes, renal and hepatic function, glucose, thyroid function, erythrocyte sedimentation rate, urinalysis, and a stool guaiac. Random extensive laboratory testing is not useful in the diagnosis of fatigue (Lane, Matthews, & Manu, 1990). Minor laboratory abnormalities are common but not clinically significant. In individual cases, additional tests may be indicated, such as electrocardiography, Holter monitoring, sleep studies, chest x-ray, serum and urine protein electrophoresis, Lyme antibody titers, and antinuclear antibodies (Lane, Matthews, & Manu, 1990).

Management

Management of patients with fatigue depends on the underlying cause. Once underlying disorders are treated, the fatigue should diminish or disappear. Depression and anxiety disorders should be treated with medications or psychotherapy. Medications that are suspected of causing fatigue should be discontinued, if possible, or the daily dose should be reduced. It is also important to establish rapport with patients and their caregivers because treatment is often prolonged.

Treatment of associated symptoms is often helpful in reducing fatigue. The studies show that treating pain, depression, and anemia in patients with cancer with appropriate medications is an effective way to improve quality of life (Rao & Cohen, 2004). Treating insomnia and sleep disorders has been shown to alleviate fatigue regardless of the etiology (Benca, Anconi-Israel, & Moldofsky, 2004).

After the cause of fatigue is understood and treatment of the underlying condition is instituted, additional strategies may be employed, such as getting enough sleep (usually 8 hours a night) and rest. Rest does not mean complete inactivity, which can lead to deconditioning, but rather scheduling quiet times when fatigue peaks (usually midday) and taking breaks during or between tasks, before fatigue sets in. Health care professionals should encourage patients with chronic fatigue to remain active by incorporating increased activity in the daily routine.

A structured exercise program can increase the muscle strength of any older adult. Exercises using the whole body can maintain strength, tone, and flexibility (e.g., swimming, outdoor walking, yoga, tai chi chuan). Exercise routines should include 5 to 10 minutes for warm-up and cool-down and stretching exercises. A gradual increase in exercise intensity and maintenance of good posture have physiological and psychological benefits. Physical therapists can help design individual exercise programs. Patients with cardiac and pulmonary disease need to consult their physician before engaging in exercise (Benca, Anconi-Israel, & Moldofsky, 2004).

In some cases, asking family or friends for assistance or hiring a home health aide can help a patient manage daily tasks. Energy-conservation techniques should also be practiced—for instance, sitting when taking a shower, brushing teeth, or shaving; working with the arms below shoulder level; eating slowly and consuming smaller and more frequent meals; pushing rather than pulling objects; walking uphill slowly; pacing activities throughout the day, alternating with breaks; breaking tasks up into smaller steps; and limiting unnecessary tasks.

Finally, psychostimulants such as methylphenidate, dextroamphetamine, or modafinil might be considered as a last resort, especially in patients whose predominant complaint is decreased alertness. The lowest doses should always be used. The use of these agents should be avoided in patients with significant heart disease and ventricular arrythmias.

Yakov Iofel

See also

Daytime Sleepiness
Sleep Disorders

Internet Resources

Chronic Fatigue Syndrome Home Page, U.S. Centers for Disease Control and Prevention Web site
http://www.cdc.gov/ncidod/diseases/cfs/cfshome.htm

Fatigue Management, University of Washington Orthopaedics Web site
http://www.orthop.washington.edu

Fatigue Management, National Institute of Health Web site
http:/www.nlm.nih.gov/medlineplus/ency/article/003088.htm

REFERENCES

Benca, R. M., Anconi-Israel, S., & Moldofsky, H. (2004). Special considerations in insomnia diagnosis and management: Depressed, elderly, and chronic pain populations. *Journal of Clinical Psychiatry*, *65* (Suppl. 8), 26–35.

Gallagher, A. M., Thomas, J. M., Hamilton, W. T., & White, P. D. (2004). Incidence of fatigue symptoms and diagnoses presenting in the UK primary care from 1990 to 2001. *Journal of the Royal Society of Medicine*, *97*(12), 571–575.

Lane, T. J., Matthews, D.A., & Manu, P. (1990). The low yield of physical examinations and laboratory investigations of patients with chronic fatigue. *American Journal of the Medical Sciences*, *299*(5), 313–318.

Matthews, D. A., Manu, P., & Lane, T. J. (1991). Evaluation and management of patients with chronic fatigue. *American Journal of the Medical Sciences*, *302*(5), 269–277.

Pouri, A., Mores, J., Cook, D. B., Findley, T. W., & Cristian, A. (2005). Fatigue in the elderly population. *Physical edicine and Rehabilitation Clinics of North America*, *16*, 91–108.

Rao, A., & Cohen, H. J. (2004) Symptom management in the elderly cancer patient: Fatigue, pain, and depression. *Journal of the National Cancer Institute, Monographs*, *32*, 150–157.

FECAL INCONTINENCE

Fecal incontinence affects 3.7% of ambulatory elderly subjects with equal gender prevalence, and 30% to 50% of nursing-home residents. It is a leading cause of nursing-home placement, with dementia and immobility as the major predisposing factors despite intact anorectal function. The treatment approach depends on the patient's ambulatory status, place of residence (i.e., institution or community), the underlying mechanism(s), and whether the problem is predominantly social or hygienic.

Pathophysiology

Fecal incontinence may result from weak or damaged internal or external anal-sphincter or pelvic-floor muscles. The loss of endovascular cushions, impaired anorectal sensation, poor rectal compliance, compromised accommodation (i.e., from aging, inflammatory bowel disease, radiation enteritis, or pelvic surgery), or neuropathy affecting the pudendal, sacral, spinal, or central nervous system may contribute to incontinence. In some patients, incomplete evacuation of stool, large stool volume, liquid stool, and the irritant effect of bile salts in the rectum may also lead to incontinence. Fecal incontinence in an elderly institutionalized person is often due to impaction in the rectum with liquid stool leaking around the fecal mass. Failure to perceive the arrival of stool in the rectum may produce either severe urgency to defecate or leakage of stool, particularly if toileting assistance is not immediate.

Management of Ambulatory Patients With Fecal Incontinence

An appraisal of a patient's history including potential predisposing factors; detailed drug history; and a systematic physical, neurological, and rectal examination should provide vital clues that will facilitate management. Therapy with a multilevel approach is outlined herein.

Drug Therapy

Specific treatment of the underlying problem of diarrhea or constipation is most important. Discontinuation of medications that may be causing diarrhea or impaction is the first step. For those with intractable diarrhea, loperamide or diphenoxylate dosed correctly will slow transit and solidify stool. If the stools are hard and difficult to expel, a regimen of controlled evacuation with suppositories or enemas at regular intervals may be necessary.

Biofeedback treatment

Biofeedback can improve fecal incontinence in 50% to 67% of selected patients in controlled and uncontrolled reports and in short- and long-term studies. This behavioral approach consists of improving external anal-sphincter muscle strength, rectal sensation, and rectoanal coordination (Rao, Welcher, & Happel, 1996). A recent controlled trial of biofeedback as first-line treatment showed little advantage over conservative medical treatment (Norton, Chelvanayagam, Wilson-Barnett, Redfern, & Kamm, 2003); but, in patients who fail conservative treatment, one long-term study showed significant improvement (Ozturk, Niazi, Stessman, & Rao, 2004).

Patients with fecal seepage have impaired rectal sensation and inappropriate elevation of anal-sphincter pressure during defecation. Biofeedback to improve rectal sensation and timing of anal-sphincter relaxation can ameliorate this symptom.

Surgical intervention

Fecal incontinence associated with rectal prolapse, rectovaginal fistula, or neurological problems such as spinal-cord injury may be amenable to surgery. Anorectal manometry provides comprehensive information regarding the integrity of the anal sphincter and the intactness of rectal sensation. Anal ultrasound study provides precise assessment of the integrity of external and internal anal-sphincter muscles, which could facilitate more accurate reconstruction.

Pudendal-nerve-terminal motor-latency measures the neuromuscular integrity of the terminal portion of the pudendal nerve and the anal-sphincter muscle. This test separates neuropathy (i.e., prolonged latency) from rectal-wall disorders and provides an explanation for muscle weakness. Reconstructive surgery may not be successful in patients with pudendal neuropathy.

Other procedures include anterior repair, artificial bowel sphincter, and sacral-nerve stimulation. Except for colostomy, none of these interventions (e.g., external sphincter sphincteroplasty, pelvic-floor muscle plication, neosphincter) can guarantee total continence. It is important that the patient is made aware of this limitation to reduce disappointment.

Management of Fecal Incontinence in Institutionalized Individuals

Urinary and fecal incontinence affects 60% or more of nursing-home residents and frequently occur together because immobility and dementia are primary risk factors (Ouslander & Schnelle, 1995). Many residents (40% to 60%) show immediate improvement in the frequency of fecal-continent episodes when provided with consistent toileting assistance to compensate for immobility and dementia that prevent them from toileting independently (Ouslander, Simmons, Schnelle, Uman, & Fingold, 1996). However, the effects of toileting assistance on the frequency of fecal incontinence, while significant, are less dramatic than those reported for urinary incontinence, primarily because of constipation (Schnelle et al., 2002).

Noninvasive interventions have been identified that address most of the risk factors common to both constipation and fecal incontinence, and these interventions are often recommended as first-line treatments in practice guidelines. These common risk factors include the use of laxatives and constipating agents, low food fluid intake and physical activity, and low toileting frequency. However, no controlled trial of an intervention in either the community or nursing-home setting has addressed these risk factors (Leung, 2006). In the nursing-home setting, these risk factors are known to occur together; hence, a multifaceted intervention would probably be the most effective approach to these prevalent and costly problems.

Management of the Social and Hygienic Aspects of Fecal Incontinence

Loss of self-esteem and self-confidence, disruption of relationships, and impairment of social and occupational activities are common. Prompt changing of soiled pads or clothes, storage of soiled material in airtight containers, and appropriate hygienic measures can mask the odor associated with fecal incontinence. Perineal washes can disguise the smell of feces. Foods that can cause malodorous discharge vary among patients and limiting their consumption is prudent. For bedridden or unconscious patients with severe diarrhea, a fecal collection pouch, rectal tube, or anal-plug device may be useful.

Moist tissue paper (e.g., baby wipes) that is not abrasive is preferable to dry toilet paper for cleansing of the perianal skin. Barrier creams may prevent skin excoriations. Perianal fungal infection should be treated with topical antifungal agents. When skin breakdown occurs, aggressive steps should be taken to divert the fecal stream and change the patient's position frequently. Scheduled toileting with a commode at the bedside or a bedpan and supportive measures to improve the general well-being and nutrition of the patient may all be effective.

Felix W. Leung
John Schnelle
Satish S. C. Rao

Acknowledgement
This research was partially supported by VA Medical Research funds.

See also

Bowel Function
Urinary Incontinence
Urinary Tract Infections

Internet Resources

American Journal of Gastrology
http://www.acg.gi.org/physicians/guidelines/FecalIncontinence.pdf

National Digestive Diseases Information Clearinghouse
http://digestive.niddk.nih.gov/ddiseases/pubs/fecalincontinence/

REFERENCES

Leung, F. W. (2006). Myths about etiologic factors of chronic constipation: scientific evidence. *Advanced Studies in Medicine*, *6*(2A), S67–S73.

Norton, C., Chelvanayagam, S., Wilson-Barnett, J., Redfern, S., & Kamm, M. A. (2003). Randomized controlled trial of biofeedback for fecal incontinence. *Gastroenterology*, *125*(5), 1320–1329.

Ouslander, J. G., & Schnelle, J. F. (1995). Incontinence in the nursing home. *Annals of Internal Medicine*, *22*, 438–449.

Ouslander, J. G., Simmons, S., Schnelle, J. F., Uman, G., & Fingold, S. (1996). Effects of prompted voiding on fecal continence among nursing home residents. *Journal of the American Geriatrics Society*, *44*, 424–428.

Ozturk, R., Niazi, S., Stessman, M., & Rao, S. S. (2004). Long-term outcome and objective changes of anorectal function after biofeedback therapy for fecal incontinence. *Alimentary Pharmacology & Therapeutics*, *20*(6), 667–674.

Rao, S. S., Welcher, K. D., & Happel, J. (1996). Can biofeedback therapy improve anorectal function in fecal incontinence? *American Journal of Gastroenterology*, *91*, 2360–2366.

Schnelle, J. F., Alessi, C. A., Simmons, S. F., al-Samarrai, N. A., Beck, J. C., & Ouslander, J. G. (2002). Translating clinical research into practice: A randomized controlled trial of exercise and incontinence care with nursing home residents. *Journal of the American Geriatrics Society*; 50, 1476–1483.

FEEDING: NON-ORAL

Definitions

Specialized nutrition support is the "provision of nutrients orally, enterally, or parenterally with therapeutic intent" and oral nutrition is defined as "nutrition taken by mouth" (Teitelbaum et al., 2005, p. 283), including the use of canned liquid supplemental beverages (A.S.P.E.N., 2002). Non-oral feeding refers to ways in which nutrient needs are met by either parenteral nutrition or enteral nutrition. The focus of this discussion is to provide an overview of non-oral feeding modalities. For further in-depth information on best practices on parenteral and enteral nutrition, review the American Society for Parenteral and Enteral Nutrition's (http://www.nutritioncare.org) published standards of practice.

Indications for Non-Oral Feeding

Non-oral feeding should be considered when an elderly person cannot, should not, or will not eat adequately (A.S.P.E.N., 2002). Furthermore, parenteral or enteral nutrition should only be implemented if such use is in accordance with one's advanced directives and if the benefits of improved nutrition outweigh the associated risks of therapy (A.S.P.E.N., 2002). The medical futility of non-oral feeding should be considered prior to starting therapy. Non-oral feeding should be "initiated in patients with inadequate oral intake for 7 to 14 days or in those patients in whom inadequate oral intake is expected over a 7- to 14-day period" (A.S.P.E.N., 2002, p. 19SA).

The determining factor whether to initiate parenteral or enteral nutrition is based on whether the gastrointestinal tract is functional and if it can be used. Enteral nutrition is preferred over parenteral nutrition because enteral nutrition is more physiologic, maintains gut integrity, costs less, is associated with reduced infection and decreased length of hospital stay (A.S.P.E.N., 2002). Parenteral nutrition is indicated when the gastrointestinal tract is not functional, cannot be accessed, or if nutrition via the enteral or oral route does not provide adequate nutrition (A.S.P.E.N., 2002).

Parenteral Nutrition

Parenteral nutrition refers to nutrients administered by the intravenous route, either through a large-diameter vein usually in the superior vena cava (i.e., central parenteral nutrition) or through a peripheral vein usually in the hand or forearm (i.e., peripheral parenteral nutrition) (Teitelbaum et al., 2005). Catheters used for central parenteral nutrition can be placed at the bedside using full barrier precautions (A.S.P.E.N., 2002). However, if a patient requires prolonged central parenteral nutrition, then a central venous access device will be inserted surgically. Peripheral parenteral nutrition is primarily indicated for short-term use (i.e., fewer than 14 days) because it contains a lower concentration of nutrients; therefore, increased nutrient needs cannot be met with this route (Worthington & Reyen, 2004a).

A parenteral nutrition solution contains amino acids, dextrose, fat emulsions, water, electrolytes, trace elements, and vitamins. A total nutrient admixture is a parenteral nutrition solution that includes intravenous fat emulsions, while a 2-in-1 formulation does not include intravenous fat emulsions (Mirtallo et al., 2004), but intravenous fat may be administered as a separate infusion with a 2-in-1 formulation. The compounding of a parenteral nutrition formulation is complex and care is taken to ensure the stability of the solution (Mirtallo et al., 2004). Select medications may be added to parenteral nutrition formulation depending on medication stability and compatibility with parenteral nutrition, such as insulin. Each parenteral nutrition solution is individualized based on the patient's nutrient requirements.

Equipment needed for administration of parenteral nutrition includes an intravenous infusion pump and an in-line filter. The infusion pump ensures consistent delivery of the prescribed rate, and the inline filter reduces infusion particulates, microorganisms, and air (Mirtallo et al., 2004). Central parenteral nutrition contains high amounts of dextrose; therefore, to prevent hypoglycemia, the solution should not be abruptly discontinued. Complications of parenteral nutrition include catheter-related complications, infection, refeeding syndrome, fluid and electrolyte abnormalities, and hepatobiliary alterations, as well as metabolic complications associated with long-term parenteral nutrition (Worthington & Reyen, 2004a).

Patients requiring long-term parenteral nutrition either to rest the gastrointestinal tract until enteral nutrition or oral feeding can resume or indefinitely because the gastrointestinal tract cannot be used, and who are metabolically stable, may be started on a cyclical administration schedule. With a cyclic schedule, a 24-hour supply of parenteral nutrition is administered over 12 to 16 hours, usually at night, so the person can be free from the infusion device during the day. Cyclical schedules help to stimulate normal eating and fasting patterns, as well as increase quality of life in patients requiring long-term parenteral nutrition (Worthington & Reyen, 2004a).

Enteral Nutrition

Enteral nutrition is defined as "nutrition provided through the gastrointestinal tract via tube, catheter, or stoma that delivers nutrients distal to the oral cavity" (Teitelbaum et al., 2005, p. 282). Enteral access tubes can be used to deliver nutrients into the stomach or small intestine. Although the stomach is the most commonly used route, enteral nutrition may be infused into the small intestine in those patients at risk for aspiration or with impaired gastric functioning. The type of tube used to administer enteral nutrition depends on the length of time enteral nutrition is anticipated to be used.

Patients requiring short-term enteral nutrition (i.e., fewer than 30 days) may have a feeding tube placed nasally or orally using a large- or small-bore tube (A.S.P.E.N., 2002). Large-bore tubes used for gastric decompression or suction may temporarily be used to provide enteral nutrition because they are uncomfortable and are associated with sinusitis, otitis media, mucosal ulcerations, necrosis, and vocal chord injury (Worthington & Reyen, 2004b). Small-bore tubes are more comfortable for the patient and are the recommended first choice for short-term enteral access (A.S.P.E.N., 2002). With proper placement, small-bore tubes can be placed into the duodenum, past the ligament of Treitz, thereby reducing the risk of aspiration. An X-ray must be obtained to confirm placement prior to the initiation of enteral nutrition because a stylet is used to place small-bore tubes (A.S.P.E.N., 2002).

Long-term enteral feeding should be provided through an enterostomy tube placed in the stomach (i.e., gastrostomy) or jejunum (i.e., jejunostomy). Gastrostomy tubes can be placed surgically, laparoscopically, endoscopically, or radiologically. Gastrostomy tubes placed endoscopically are referred to as a percutaneous endoscopic gastrostomy (PEG) tube. Jejunostomy tubes can be placed surgically or endoscopically (PEJ). Combination dual lumen tubes can also be used in patients who require gastric decompression while being fed distally into the jejunum (Worthington & Reyen, 2004b).

A variety of commercially prepared liquid formulas is available. Selection of the most appropriate formula to deliver enteral nutrition is based on the patient's underlying disease state and clinical characteristics. Standard enteral formulas are either low-residue or fiber-enriched and have approximately 1 kcal/ml; concentrated formulas provide 1.5 to 2.0 kcal/ml and are used primarily for fluid-restricted patients or those with increased nutrient needs. Disease-specific formulas include elemental formulas (used for impaired gastrointestinal absorption or fat intolerance); formulas for those with renal failure, hepatic failure, or respiratory failure; as well as formulas for those with specific diseases such as diabetes, metabolic stress, and acquired immunodeficiency syndrome (AIDS) (Worthington & Reyen, 2004b). A blenderized diet, where natural food is blended to a liquid state, may be appropriate for home enteral nutrition patients (Worthington & Reyen, 2004b).

Enteral nutrition can be administered by gravity or pump-controlled delivery methods. With the bolus method, a large syringe is connected to the feeding tube and formula flows by gravity into the stomach. Similarly, with the gravity-drip method, formula is placed into an administration set and allowed to flow by gravity into the stomach, usually over 30 to 60 minutes. A pump-controlled delivery method provides a continuous slow infusion of formula, usually over 16 hours (Worthington & Reyen, 2004c). Enteral nutrition can be administered via an open or closed administration system. With an open system, formula is poured into a refillable administration set several times per day; with a closed system, the enteral formula in the delivery container is prefilled by the manufacturer. Closed systems reduce nursing time and are associated with decreased bacterial infection (Worthington & Reyen, 2004c). Enteral nutrition complications include tube-related complications, aspiration, gastrointestinal disturbances, dehydration, fluid and electrolyte imbalances, and bacterial contamination of formula (Worthington & Reyen, 2004b, 2004c).

Medicare Reimbursement for Non-Oral Feeding

Home parenteral and enteral nutrition is covered under Medicare Part B's prosthetic-device benefit only if the test of permanence, defined as "the impairment giving rise to the therapy will be of long and indefinite duration" (http://www.cms.hhs.gov/home/medicare.asp), is met. Health professionals are now concerned that prescription-drug coverage under the new Medicare Part D will not adequately meet the needs of the elderly requiring home parenteral nutrition (see Medicare Part D Position Statement at http://www.nutritioncare.org).

ROSE ANN DIMARIA-GHALILI

See also

Caloric Intake
Dehydration
Eating and Feeding Behaviors
Gastrointestinal Diseases
Gastrointestinal Physiology

Internet Resources

American Dietetic Association
http://www.eatright.org

American Gastroenterological Association
http://www.gastro.org/

American Society of Health-System Pharmacists
http://www.ashp.org/news/ShowArticle.cfm?id=13976

American Society for Parenteral and Enteral Nutrition
http://www.nutritioncare.org/

Center for Medicare and Medicaid Services
http://www.cms.hhs.gov/home/medicare.asp

Infusion Nurses Society
http://www.ins1.org

National Institutes of Health: Nutritional Support Information
http://www.nlm.nih.medlineplusgov//nutritionalsupport.html

Oley Foundation
http://www.oley.org

REFERENCES

A.S.P.E.N. Board of Directors and the Clinical Guidelines Task Force (2002). Guidelines for the use of parenteral and enteral nutrition in adult and pediatric patients. *Journal of Parenteral and Enteral Nutrition*, *26*(1 Suppl.), 1SA–138SA.

Mirtallo, J., Canada, T., Johnson, D., Kumpf, V., Petersen, C., Sacks, G., et al. (2004). Safe practices for parenteral nutrition. *Journal of Parenteral and Enteral Nutrition*, *28*(6), S39–S70.

Teitelbaum, D., Guenter, P., Howell, W. H., Kochevar, M. E., Roth, J., & Seidner, D. L. (2005). Definition of terms, style, and conventions used in A.S.P.E.N. guidelines and standards. *Nutrition in Clinical Practice*, *20*(2), 281–285.

Worthington, P., & Reyen, L. (2004a). Administration of parenteral nutrition. In P. Worthington (Ed.), *Practical aspects of nutritional support: An advanced practice guide* (pp. 367–398). Philadelphia: Saunders.

Worthington, P., & Reyen, L. (2004b). Equipment and formulas for enteral nutrition. In P. Worthington (Ed.), *Practical aspects of nutritional support: An advanced practice guide* (pp. 283–309). Philadelphia: Saunders.

Worthington, P., & Reyen, L. (2004c). Initiating and managing enteral nutrition. In P. Worthington (Ed.), *Practical aspects of nutritional support: An advanced practice guide* (pp. 311–341). Philadelphia: Saunders.

FINANCIAL ABUSE

Hundreds of thousands of elderly individuals across the country are affected by elder abuse. Financial abuse—the illegal or improper use of an elder's financial assets for profit or gain by another—is one of the fastest growing and least understood forms of abuse. The definition of financial abuse varies among states, and evaluating whether financial abuse has occurred is a complex task.

Financial abuse occurs in all socioeconomic, ethnic, and racial groups. Most reported incidents involve White women age 70 and older who live alone. Risk factors for abuse may include impaired mental capacity; cognitive, psychiatric, and or physical impairment that results in dependency on a caregiver; social isolation; lack of familiarity with financial matters; poor financial knowledge and judgment; and loss of a loved one or spouse.

Financial abuse can be perpetrated by anyone, including family members, trusted friends, or professionals and caregivers. Frequently cited motivations include the perpetrator's substance abuse, mental health, gambling, or financial problems (National Committee for the Prevention of Elder Abuse, 2001; Tueth, 2000).

Loss of an elder's financial assets can result in increased morbidity and mortality. Decreased immune-system functioning, malnutrition and dehydration, and depression can result. Elder mistreatment is associated with a 3.1 times greater risk of dying, after adjusting for other factors associated with increased mortality in older adults (Lachs, Williams, O'Brien, Pillemer, & Charlson, 1998).

Every state has elder abuse laws, Adult Protective Service (APS) agencies, or mental health legislation that authorizes the state to protect and provide services to vulnerable, incapacitated, or disabled adults. Most common among the elder abuse statutes are provisions for confidential mandatory or permissive reporting by health care and social services providers.

Indicators of Possible Financial Abuse

Some potential indicators of possible financial abuse may include a change in the elder's spending habits (i.e., the person was frugal his or her entire life and suddenly begins to spend or "give away" substantial amounts of money with implausible or unclear explanations). Financial transactions that are uncharacteristic of the elder or inconsistent with the elder's abilities (e.g., the ATM card is being used, but the elder is homebound; computer transactions for an elder who does not have a computer; documents with altered or suspicious signatures) can signal financial abuse. Furthermore, a power of attorney executed by a confused elder or changes in an elder's trust, will, or deed that are not consistent with the elder's prior wishes may indicate inappropriate outside financial influence. As with any type of elder abuse or mistreatment, behavioral indicators include fear, withdrawal, depression, hopelessness, hesitation to talk openly, confusion or disorientation, and untreated health problems. The elder may relate improbable stories about potential financial abuse, and these should be investigated even if the elder has a history of aggrandizing and manipulating supposed injuries, personal or otherwise.

Additional potential indicators may be gleaned from others who know the victim or by analyzing the behavior of the abuser. Family members, caregivers, neighbors, bank tellers, and notaries can be important informants and provide clues about financial abuse. Abusive caregivers may be reluctant to participate in the investigation or cooperate with service providers in planning for care and may socially isolate the elder.

Health Care Providers' Role in Preventing, Detecting, and Reporting Financial Abuse

Health care providers are in a unique position to prevent and detect elder financial abuse. When a person is diagnosed with a dementing disorder, such as Alzheimer's disease, the patient and family should be warned about the potential for financial abuse and be given practical suggestions for protective interventions (e.g., having a cosigner on bank accounts, contacting the bank about options for protecting the vulnerable senior's assets, consulting an elder law attorney).

As the dementia syndrome progresses, higher order functional capacities begin to erode. One of the first areas adversely affected is the individual's ability to manage his or her finances. Elder individuals who had previously been competent and independent in managing their financial affairs (e.g., writing checks, paying bills, making decisions about investments and charitable donations) demonstrate difficulty in making complex financial transactions and decisions. Unfortunate examples abound: the 82-year-old man who sends $150,000 in cash to a telephone solicitor who told him that it would guarantee his winning the $5 million Canadian lottery; the 75-year-old woman who gives $250 each week to the "nice young man" who takes out her trash, or the 86-year-old woman who unknowingly deeds her home of 35 years to her new "best friend." Transfer of financial authority from an impaired elder to a family member, caregiver, or other person must be done cautiously. It can protect the elder from abuse or, in the hands of the abuser, can be a "license to steal."

Interactions between the elder and caregiver should be observed. The caregiver should be invited to leave the room to provide an opportunity for the elder to speak privately with the clinician. During this time, the elder should be tactfully asked if he or she is being taken advantage of in any way. The elder is unlikely to bring it up. The clinician may ask questions such as: Does the elder have adequate financial resources for basic needs? Are these needs being met? If not, why? Has the elder recently signed any documents without understanding their meaning? The elder is encouraged to discuss concerns about his or her living situation, including the potential of financial abuse.

When financial abuse is suspected, the clinician should document the patient's cognitive and functional status with a validated measure and specific questioning about the elder's financial knowledge including relevant direct quotes. It is not the health care provider's responsibility to confirm that abuse has occurred; rather, the responsibility is to report a reasonable suspicion to the appropriate investigative entity (e.g., the long-term-care ombudsman program for abuse involving nursing-home residents, APS offices, or local law enforcement).

Capacity and Undue Influence

Elders have the right to self-determination and control of their affairs until they delegate responsibility or a court grants responsibility to someone else. All adults have presumptive mental competence unless and until proved otherwise. Hence, an elder has the right to make what may seem to be a poor decision.

Two questions raised in many cases of possible elder financial abuse are: Did the elder have the mental capacity to make a competent decision? Was the elder inappropriately manipulated and therefore unduly influenced?

Although states have different definitions of legal capacity (Grisso, 1994), most statutes refer to deficits in certain functional abilities pertaining to decision making and judgment. Two types of capacity that often come into question in financial abuse cases are testamentary capacity to make or change a will and the capacity to enter into a contract, usually defined as understanding the nature and consequences of a transaction. A court must determine whether an individual consented to a business transaction, purchase, or other action. Medical and mental health professionals assist the court, law enforcement, and APS by evaluating individuals with questionable mental capacity.

Dr. Margaret Singer (1993), the late expert in the field of undue influence, noted that this phenomenon occurs when people use their role and power to exploit the trust, dependency, and fear of others and they use this power to deceptively gain control over the weaker decision making of another person. Bernatz has developed the S-C-A-M model that is used at the Los Angeles County Elder Abuse Forensic Center. S-C-A-M is an acronym that describes the common indicators of possible undue influence. This model addresses the factors that contribute to the victim's ***Susceptibility*** or vulnerability; whether the victim and abuser had *a **Confidential** and trusting relationship*: if the abuser ***Actively*** procured the financial instruments or made the financial transactions; and whether there was ***Monetary** loss* to the victim and gain to the abuser.

Protecting Against Financial Abuse

Financial education that includes financial literacy, proactive health care, and legal and financial planning (including planning for the possibility of incapacity) should be encouraged by clinicians as a means of preventing financial abuse. Assessment of the financial management needs of the elderly can determine which services are necessary. Interventions can range from requiring an elder's attendant to provide receipts for purchases to more complex services involving attorneys. Interventions include but are not limited to arranging for direct-deposit banking, establishing a joint-tenancy account, hiring a money-management service, executing a power of attorney or durable power of attorney, establishing a trust, or filing for probate conservatorship or guardianship. When considering an intervention, the least restrictive alternatives for protecting an elder's assets should be used in order to allow for the highest level of autonomy.

SUSAN I. BERNATZ
TEMPERANCE EVANS

See also
Elder Mistreatment: Overview
Money Management

Internet Resources
Commission on Legal Problems of the Elderly
http://www.abanet.org/elderly/

National Administration on Aging
http://www.aoa.gov

National Aging Information Center
http://www.aoa.dhhs.gov/naic

National Center on Elder Abuse
http://www.gwjapan.com/NCEA

National Committee for the Prevention of Elder Abuse
http://www.preventelderabuse.org

REFERENCES

Grisso, T., (1994). Clinical assessments for legal competence of older adults. In M. Storandt and G. VandenBos (Eds.), *Neuropsychological Assessment of Dementia and Depression in Older Adults* (pp. 119–139). Washington, DC: American Psychological Association.

Lachs, M. S., Williams, C. S., O'Brien, S., Pillemer, K. A., & Charlson, M. E. (1998). The mortality of elder mistreatment. *Journal of the American Medical Association*, 1998; *280*, 428–432.

National Committee for the Prevention of Elder Abuse, 2001. National Center on Elder Abuse summaries of the statistical data on elder abuse in domestic settings: An exploratory study of state statistics for FY 93 and FY 94. Available at http://www.aoa.gov/abuse/report/Cexecsum.html

Singer, M. T. (1993). Undue influence and written documents: Psychological aspects. *The Cultic Studies Journal*, 10(1), 19–32.

Tueth, M. J. (2000). Exposing financial exploitation of impaired elderly persons. *American Journal of Geriatric Psychiatry*, *8*, 104–111.

FINANCING RETIREMENT

See
Pensions and Financing Retirement

FIRST NATION PEOPLES AND DEMENTIA

In North America, the term *First Nations* encompasses the Indian, Metis, and Inuit populations, whereas in many other parts of the world, the terms *native* and *indigenous* are used to define a group of people who have inhabited a country for its known history and have maintained a distinct cultural identity, often markedly different to that of later settlers. The United Nations has failed to agree on a standard definition for these population groups and has historically referred to them as *indigenous peoples*, a term also adopted by the World Health Organization (WHO) (United Nations, 2004; World Health Organization, 2002). With increased globalization, WHO has recognized that indigenous people are often marginalized by a dominant culture and frequently encounter disparity in health provision compared to mainstream health delivery.

The incidence of dementia within these groups is not clearly expressed but research to date suggests that age-specific incidence of dementia is similar throughout the world and with the increasing graying of global populations, there will be a corresponding incidence of dementia in indigenous peoples (Manly & Espino, 2004). Cultural norms and familiar traditions play an important role in how care is assigned to those indigenous clients experiencing dementia. Issues such as familiar responsibilities, collective family assistance, and perceptions of mental health all contribute in the recognition of the dementing process and subsequent care (Braun & Browne, 1998). Resistance to using outside services because of lack of finances, fear of being misunderstood or intimidated, and a lack of trust in health care workers has also been noted in indigenous communities (Kelaher et al., 1998; Morgan, Stewart, Crossley, D'Arcy, Biem, & Kirk, 2005). These issues, combined with the assumption that mental decline is an inevitable progression of aging and a greater tolerance in many indigenous communities concerning altered behavior patterns, have led to a delay in the diagnosis of dementia. There is currently little effective treatment in halting the inevitable decline associated with most dementias; however, new drugs and interventions are constantly being trialed. A lack of diagnosis of dementia within indigenous groups may result in older members missing the opportunity to receive these new treatments.

One of the tools commonly employed for assessing mental competence is the Mini Mental State Examination (MMSE). Low education levels, poor literacy competencies, language differences, and visual or auditory impairment all impact the results and need to be acknowledged. A further concern with the test is the lack of cultural appropriateness of the test itself because questions need to be adapted to the circumstances and relevant to the client's environment. Equally, the test administrator is required to be skilled in the social interactions within a specific community and able to converse in the dominant language of the client. Memory lapses, sensory loss, speech impediments, and the acculturation of subsequent generations make early diagnosis of dementia difficult in all population groups, but the indigenous population is at even greater risk of having a delayed diagnosis and loss of subsequent support and intervention.

Sue Brown
Mary Fitzgerald

See also

American Indian Elders
Cultural Competence and Aging
Dementia: Overview

Internet Resources

Alzheimer's Association
http://www.alz.org/overview.asp

American Indian and Alaskan Native Roundtable on Long-Term Care
http://www.ihs.gov/PublicInfo/PublicAffairs/PressReleases/Press_Release_2002/Final_LTC_Report_ALL.pdf

Australian Aboriginal Health
http://www.healthinfonet.ecu.edu.au/

Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (*DSM-IV-TR*)
http://allpsych.com/disorders/dsm.html

First Nations Summit
http://www.fns.bc.ca/about/health.htm

Medline
http://www.nlm.nih.gov/medlineplus/dementia.html

Scottish Intercollegiate Guidelines Network
http://www.sign.ac.uk/pdf/sign86.pdf

World Health Organization, Aging and Life Course
http://www.who.int/ageing/en/

REFERENCES

Braun, K. L., & Browne, C. V. (1998). Perceptions of dementia, caregiving, and help-seeking among Asian and Pacific Islander American. *Health and Social Work*, *23*(4), 262–274.

Kelaher, M., Baigrie, N., Manderson, L., Moore, L., Shannon, C., & Williams, G. (1998). Community perceptions of health, illness and care: Identifying issues for indigenous communities. Co-published simultaneously in Australian women's health: Innovations in social science and community research. *Women & Health*, *28*(1), 41–61.

Manly, J. J., & Espino, D. V. (2004). Cultural influences on dementia recognition and management. *Clinics in Geriatric Medicine*, *20*(1), 93–119.

Morgan, D. G., Stewart, N. J., Crossley, M., D'Arcy, C., Biem, J., Kirk, A., et al. (2005). Happenings dementia care in rural and remote areas: The first year of a CIHR new emerging team. *The Canadian Journal of Nursing Research = Revue Canadienne de Recherche en Sciences Infirmières*, *37*, Part 1, 177–182.

United Nations (2004). *The concept of indigenous peoples*. New York: United Nations.

World Health Organization (2002). *International decade of the world's indigenous people*. Geneva: WHO.

FOOT PROBLEMS

Managing foot problems in older patients involves a comprehensive assessment, continuing surveillance, education, prevention strategies, and a team approach. Key elements include demographics and social history; present illnesses; medical history; current medications; dermatological, onychial, orthopedic (i.e.., biomechanical and pathomechanical), vascular, and neurological evaluations; stratification of risk for keratosis; ulcer classification, if present; determining risk; and a management plan (Helfand, 2006a). Causes of foot problems in the elderly include the aging process, diseases, decreased ambulation, limited activity, multiple medications, and injuries.

Onychial (Toenail)

Onychia is inflammation of the posterior toenail wall and bed. It is usually precipitated by local trauma or pressure, or as a complication of systemic diseases such as diabetes mellitus and peripheral arterial insufficiency. Onychia is usually an early sign of a developing local infection. Mild erythema, swelling, and pain are common, and tepid saline compresses and pressure reduction help initially. Untreated onychia leads to paronychia, with significant infection and abscess of the posterior nail wall. Infection progresses proximally, deeper structures become involved, and may lead to necrosis, gangrene, and even amputation. Management includes pressure reduction, drainage, imaging, and antibiotics.

Toenail deformities result from repeated microtrauma, degenerative changes, or disease. Without periodic débridement, the nail structure hypertrophies, thickens (onychauxis), and becomes deformed. Onychogryphosis is usually complicated by fungal infection with disability and pain that can limit ambulation. Exaggerated curvature or onychodysplasia may cause the nail to penetrate the skin, leading to infection and ulceration. Traumatic avulsion of the nail is common and management consists of local débridement, mild keratolytics, and emollients. Patients with sensory loss may not complain of pain and discomfort (Helfand, 2006a).

The most common nonbacterial infection of the toenails is onychomycosis, a chronic and communicable disease. In superficial infections (white onychomycosis), changes appear on the superior surface of the toenail and generally do not invade the deeper structures. In more complicated cases, the nail bed and nail plate are infected from the distal edge (i.e., onycholysis). Candida infections are common in patients with mucocutaneous manifestations. Mycotic onychia; autoavulsion; subungual hemorrhage; a foul, musty odor; and degeneration of the nail plate are common. When the nail matrix becomes involved, hypertrophy and deformity occur. Multiple medications and vascular impairment in older patients complicates systemic treatment. Initial management includes a topical fungal solutions, keratolytics, and systemic antifungals.

Ingrown toenails in the elderly are usually the result of deformity, onychodysplasia, and improper self-care. When the nail penetrates the skin, abscess and infection result. If not managed early, periungual granulation tissue develops and complicates treatment, which entails removing the offending nail segment to establish drainage, saline compresses, and antibiotics. Excision, fulguration, desiccation, caustics, and/or astringents reduce granulation tissue. In all cases, removal of the penetrating portion of the nail is essential. Long-standing cases usually require surgical revision.

Hyperkeratosis

Many elderly patients develop hyperkeratotic lesions, such as the tyloma (i.e., callus) and the heloma (i.e., corn), including hard, soft, vascular, neurofibrous, seed, and subungual types. Intractable keratoma, eccrine poroma, porokeratosis, and verruca must be differentiated from keratotic lesions, although each may present initially as a hyperkeratotic area. Compressive, tensile, or shearing stress creates these problems. Soft-tissue loss and atrophy of the plantar fat pad increases pain and limits ambulation. Contractures, gait changes, deformities, incompatibility between foot type and shoe last, and arthritis are additional factors that need consideration. Many factors, including skin tone and elasticity, predispose patients to keratotic lesions (Helfand & Jessett, 2006).

Management focuses on the functional and activity needs including débridement, padding, weight dispersion and diffusion, emollients, shoe modifications and last changes, orthoses, and surgical revision. Keratotic lesions can become primary irritants and produce local avascularity, thus precipitating ulceration. Pressure ulcers in the foot usually begin with subkeratotic hemorrhage. If débrided and managed properly, ulcers usually heal. However, the problems may persist due to residual deformity and systemic diseases, such as diabetes mellitus.

Dermatological Problems

Dryness of the skin, or xerosis, due in part to decreased hydration and lubrication, is part of normal aging. Fissures that develop with associated stress are at risk for ulceration. Initial management includes using an emollient and a mild keratolytic (Helfand, 2006a). Pruritus is also common and is more severe in cold weather.

Treatment of hyperhidrosis and bromhidrosis depends on the cause. If local, astringents may control excessive perspiration and odor—for example, the short-term use of neomycin powder helps control odor by reducing the bacterial decomposition of perspiration. Topical antifungal foot powders and footwear and stocking modifications should be considered. Dampness and cold can predispose patients to vasospastic effects.

Chemicals used in shoes, footwear fabrics, and stockings may produce contact dermatitis. Clinical findings usually consist of bilateral skin lesions. Management includes removing the primary irritant; skin and shoe testing; mild–wet dressings; and low-dose topical steroids (e.g., 0.5% hydrocortisone).

Stasis dermatitis is common in patients with dependent edema and results from venous insufficiency and chronic ulceration. Management includes elevation, wet dressings, topical steroids, antibiotics, and managing the venous disease. Pyoderma and superficial bacterial infections should be managed with antibiotics and wound-care protocols.

Tinea pedis in elderly patients is often an extension of onychomycosis and common in warm weather. Poor foot hygiene and inability to see their feet may cause patients to postpone seeking care until the condition becomes clinically significant. Many topical medications can manage this condition initially. Antifungal foot powders provide effective prevention.

Other common dermatological manifestations in the elderly are those associated with atopic dermatitis, nummular eczema, neurodermatitis, and psoriasis.

Simple or hemorrhagic bullae are related to shoe trauma and friction or systemic diseases such as diabetes mellitus. Hemorrhagic bullae related to diabetes mellitus are usually early ulcerative indicators. Management involves eliminating pressure, supportive dressings, shoe modifications, protection, and drainage when appropriate. Gait changes can magnify many foot–shoe incompatibilities resulting in foot lesions.

Most foot ulcerations in older patients are related to diabetes mellitus, peripheral arterial insufficiency, and continuing pressure and trauma. Care involves supportive measures to reduce trauma and pressure to the ulcerated area, orthoses, shoe modifications, and special shoes. Therapeutic shoes are a Medicare entitlement and are appropriate for diabetic patients. Prevention and control of infection is important and keratosis must be débrided to prevent the ulcer from roofing. Physical modalities and exercises can improve the local vascular supply. Atrophy of soft tissue and arthritis residuals are associated with ulcerations. Management focuses on identifying the cause, instituting local supportive measures, treating related systemic diseases, minimizing osteomyelitis, and maintaining ambulation as long as possible.

Older patients should wear appropriate footwear at all times to avoid foreign bodies and foot injuries. Care of geriatric patients should strive to reduce foot pain and improve functional capacity because their quality of life depends largely on their ability to remain mentally alert and ambulatory.

Biomechanical and Pathomechanical Problems

Mechanical abnormalities of the feet create pain and functional problems in gait and balance and make it difficult to obtain proper footwear. Several conditions involve the hallux (i.e., great toe) such as hallux valgus and hallux rigidus, digitus flexus (i.e., hammer toe), digitus quintus varus, overlapping toes, underriding toes, prolapsed metatarsals, pes cavus, pes planus, pronation, and splay foot. Treatment can be nonsurgical or surgical and depends on the patient's ability adapt to ambulatory changes, to have an anatomically corrected joint, and whether he or she can ambulate without pain after treatment.

These abnormalities can produce inflammatory changes such as periarthritis, bursitis, myositis, synovitis, neuritis, tendinitis, sesamoiditis, plantar myofascitis, plantar fasciitis, calcaneal spurs, periostitis, tenosynovitis, atrophy of the plantar fat pad, metatarsal prolapse, metatarsalgia, anterior imbalance, Haglund's deformity, entrapment syndrome, and neuroma. Conservative interventions include shoe modifications, orthoses, braces, physical medicine, exercises, and mild analgesics. Shoes themselves do not cause pain; rather, pain arises when shoes are improperly used and/or designed.

Fractures of the foot and toes may result from direct trauma or stress related to bone loss. Most uncomplicated and closed fractures in good position can be managed with surgical shoes and supportive dressings that immobilize distal and proximal joints. Silicone molds can be used for digital fractures.

Shoe modifications for the elderly include mild calcaneal wedges to limit motion and alter gait, metatarsal bars to transfer weight, Thomas heels to increase calcaneal support, long shoe counters to increase mid-foot support and control foot direction, heel flares to add stability, shank fillers or wedges to produce a total weight-bearing surface, steel plates to restrict motion, and rocker bars to prevent flexion and extension. Other internal modifications include longitudinal arch pads, wedges, bars, lifts, and tongue or bite pads.

Rheumatoid changes cause early-morning stiffness, pain, fibrosis, ankylosis, contracture, deformity, impairment, ambulatory dysfunction, and the reduction of ambulation. Management includes nonsteroidal anti-inflammatory drugs, local steroid injections, physical medicine, shoe modifications, orthoses for weight diffusion, dispersion, support, and stabilization. Surgical revision of deformities is also an option. Supportive devices such as a cane may also be indicated with balance concerns and fall prevention.

Peripheral Arterial, Sensory, and Diabetic Problems

Foot complaints associated with peripheral arterial, sensory, and diabetic changes include fatigue, resting pain, coldness, burning, color changes, tingling, numbness, diminished hair growth, thickening toenails, ulcerations, phlebitis, cramps, edema, claudication, and repeated foot infections. Primary physical findings include diminished or absent pulses in the foot and throughout the entire extremity, depending on the location and degree of occlusion. Hypertensive patients may demonstrate pulsations that falsely reflect vascular supply. Color changes include rubor and/or cyanosis, and the foot usually feels cool. Vasospastic changes are especially pronounced in colder climates. The skin is usually dry, with pronounced atrophy of the skin and soft tissues. Superficial infections are common and painful when infections persist. Neurological assessment of the foot should include Achilles reflex, vibratory sensation, sharp and dull response, superficial plantar response (Babinski), paresthesia, burning, joint position, and testing for the loss of protective sensation with a monofilament or vibratory threshold meter.

Older diabetic patients present special foot problems. It is estimated that 50% to 75% of all amputations in diabetic patients could be prevented by early intervention, improved health education, preventive strategies, and periodic evaluation before the onset of significant symptoms and pathology (Armstrong & Lavery, 2005; Helfand, 2006b). Elderly diabetic patients with neuropathy have insensitive feet with paresthesia, sensory impairment to pain and temperature, motor weakness, diminished or lost Achilles and patellar reflexes, decreased vibratory sense, sensory loss, loss of proprioception, xerotic changes, anhidrosis, neurotrophic arthropathy, atrophy, neurotrophic ulcers, and possibly a marked difference in size between the two feet. There is increased prevalence and incidence of infection, necrosis, and gangrene. Vascular impairment is characterized by pallor, absent or decreased posterior tibial and dorsalis pedis pulse, dependent rubor, decreased venous filling time, skin coolness, trophic changes, numbness, tingling, cramps, and pain. Loss of the plantar metatarsal fat pad predisposes ulceration relative to the existing deformities of the foot.

Hyperkeratotic lesions form as space replacements and are prone to ulceration because of increased pressure on the soft tissues, subcallosal hematoma, and localized avascularity. Tendon contractures and claw toes (i.e., hammer toes) are common. A warm foot with pulsations in an elderly diabetic patient with neuropathy is common. When ulceration is present, keratosis tends to roof the lesion and retards or prevents closure and may progress to infection, necrosis, and gangrene. Footdrop, a loss of position sense, and pretibial lesions are indicative of neuropathy and microvascular infarction. Arthropathy gives rise to deformity, altered gait patterns, and increased risk for ulceration and limb loss.

X-rays of the feet of elderly diabetic patients usually demonstrate thin trabecular patterns, decalcification, joint position changes, osteophytic formation, osteolysis, deformities, and osteoporosis. Bone scans and MRI studies should be completed.

Management begins by reducing local trauma with orthotics, shoe modifications, and specialized footwear; efforts to maximize weight diffusion and weight dispersion; vasomodifiers; exercise; local débridement; and appropriate antibiotics. Asymptomatic elderly patients with diabetes mellitus should be assessed at least twice a year to prevent and manage foot problems.

ARTHUR E. HELFAND

See also

Diabetes: Management
Gait Disturbances
Pruritis

Internet Resources

American Podiatric Medical Association
http://www.apma.org/

National Institute for Aging
http://www.niapublications.org/engagepages/footcare.asp

REFERENCES

Armstrong, D. G., & Lavery, L. A. (2005). *Clinical care of the diabetic foot*. Alexandria, VA: American Diabetes Association.

Helfand, A. E. (2006a). Diseases and disorders of the foot. In P. Pompei & J. B. Murphy (Eds.), *Geriatric review syllabus: A core curriculum in geriatric medicine* (6th ed.). New York: Blackwell Publishing.

Helfand, A. E. (2006b). *Public health and podiatric medicine: principles and practice* (2nd ed.). American Public Health Association Press.

Helfand, A. E., & Jessett, D. F. (2006). Foot problems in the elderly. In M. S. J. Pathy (Ed.), *Principles and practice of geriatric medicine* (4th ed.). Edinburgh: John Wiley & Sons.

Merriman, L. M., & Turner, W. (2002). *Assessment of the lower limb* (2nd ed.). London: Churchill Livingstone, Elsevier.

Turner, W. A., & Merriman, L. M. (2005). *Clinical skills in treating the foot* (2nd ed.). London: Churchill Livingstone, Elsevier.

FRACTURES

Because bone mass decreases and bone fragility and fall risk increase, the number of fractures in the elderly grows exponentially with age. Many fractures are a complication of osteoporosis, a disease of poor bone strength that affects more than 10 million Americans aged 50 and older. Osteopenia is a related disease characterized by low bone mass that affects more than 30 million and places people at risk for osteoporosis and fracture (U.S. Department of Health and Human Services, 2004).

Pharmacological interventions may slow, if not reverse, bone loss associated with aging. Anti-osteoclast drugs called bisphosphonates and anabolic agents such as parathyroid hormone (PTH) promote bone growth and expedite fracture healing (Gass & Dawson-Hughes, 2006; Morley, Whitfield, & Willick, 2001; Rizzoli, 2006). In addition, hip protectors have been designed to prevent fractures in the elderly, but their effectiveness is questionable (Parker, Gillespie, & Gillespie, 2006). Fall prevention programs have been shown to reduce the number of falls, but no intervention alone or in combination has eliminated falls and fractures.

The types of fractures that occur in the elderly are distinct and generally result from low-energy falls on osteoporotic bone. Fractures in older people generally occur in metaphyseal trabecular bone, whereas fractures in younger people generally occur in diaphyseal cortical bone as the result of high-energy trauma. In the upper extremity, these “frailty” fractures are found in the distal radius and proximal humerus and around the elbow. In the axial skeleton, vertebral compression fractures are common, and in the lower extremities, hip (proximal femur) and tibial plateau fractures are common. The prevalence of these fractures differs, as does their treatment, morbidity, nursing requirements, and outcome.

The treatment of these patients requires an interdisciplinary approach. In the operating room, locking plate systems have become the “gold standard” for fracture fixation. They can be applied minimally invasively in place of conventional reconstruction plates and work well in osteoporotic bone, although supporting data are limited (Fulkerson et al., 2006)

Upper Extremity Fractures

Distal Radius

One of the most common upper-extremity fractures in the elderly is the distal radius fracture, or Colles’ fracture. These fractures often occur as a result of falling onto an outstretched hand. There is usually a marked deformity of the wrist, accompanied by significant swelling. The majority of these fractures are managed in the outpatient setting, with initial emphasis on elevation of the affected extremity. Initially, these fractures are treated with reduction of the bone fragments and placement of a plaster splint. If the swelling is not excessive, a short arm cast may be applied immediately after reduction. If reduction of the fracture fragments is inadequate (based on the radiographic findings, the patient’s age, and physiological function), operative reduction and stabilization of the fracture may be required. Operative stabilization can be achieved with internal or external fixation or both. In the elderly, however, operative intervention is relatively uncommon.

Approximately 10 to 14 days after fracture reduction, the fracture is usually checked radiographically. Although in a few cases operative intervention is necessary, the majority of these fractures remain adequately reduced. The splint is removed and a short arm cast is applied. The extremity remains casted for an additional 4 to 5 weeks. When adequate healing has occurred—determined radiographically as well as clinically—the cast is removed. A removable wrist splint is applied and occupational therapy is begun to regain motion and strength of the wrist. Prior to this, the only therapy is range-of-motion exercises of the fingers and elbow. Although some residual deformity is common after these injuries, the majority of these fractures heal well with minimal functional deficit.

Elbow

Fractures of the elbow are usually the result of falls directly onto the elbow, resulting in fracture of either the olecranon or the distal supracondylar humerus. Many of these fractures are displaced and require immediate operative intervention with open reduction and internal fixation. Restoration of function depends of the quality of the reduction and the strength of the fixation. If the joint surfaces have been reduced and there is good fixation of metal to bone, a good functional outcome can be expected. Frequently, however, fixation of the screws and plates to osteoporotic bone is less than optimal, and the elbow must be immobilized longer than usual, resulting in stiffness and a compromised functional outcome. If there is significant comminution of the fracture so that the joint cannot be restored, total elbow replacement may be necessary.

Proximal Humerus

After distal radius fractures, fractures of the proximal humerus are the second most common fracture of the upper extremity. These fractures also usually occur as a result of falling onto an outstretched hand. Fortunately, the majority of these fractures require little intervention by the orthopedic surgeon and can be treated by placing the arm in a sling to immobilize the shoulder. The duration of immobilization is variable, but with nondisplaced or minimally displaced fractures, only a few weeks of stringent immobilization are necessary. During this early postfracture period, the patient remains quite uncomfortable and often can sleep only in an upright position. Early pendulum exercises can usually be initiated, followed by more formal occupational therapy with the use of overhead pulleys. Generally, these fractures heal well, but restoration of a normal range of motion, especially regaining active motion of the shoulder with overhead activity, is rare. This limitation in motion is caused not by the bony injury but rather by the injury to the rotator cuff of the shoulder.

More comminuted or displaced fractures of the proximal humerus require operative intervention by either stabilizing the fracture fragments with metal hardware or replacing the humeral head with a hemiarthroplasty. The advantage of fixing the fracture operatively is that the shoulder can be mobilized early, improving the functional outcome. Although replacement of the humeral head with a prosthesis seems like a good solution for the treatment of severally comminuted osteoporotic fractures, it is not, because the rotator cuff has likely been severely injured by that point. Thus, the functional outcome of these patients is quite poor, with few patients achieving active motion of the shoulder above that level.

Vertebral Compression Fractures

Although not considered a significant clinical problem from an orthopedic standpoint because they rarely require surgical intervention, vertebral compression fractures cause significant morbidity. These fractures may be the result of a fall, but they can also be the result of merely lifting a heavy object. Frequently, the patient does not seek medical attention and, in fact, little can be done for these patients other than prescribing analgesics and early mobilization. If the pain is severe or if it persists, the use of a supporting brace can be beneficial. Only if there is severe deformity and significant neurological compromise is operative treatment indicated. If surgery is performed, it is technically difficult to achieve good fixation in osteoporotic bone. Less invasive alternatives to open vertebroplasty, including percutaneous vertebroplasty and kyphoplasty, are gaining popularity. Kyphoplasty involves the insertion and inflation of a balloon into the compressed vertebra to restore vertebral height and cement injection to fortify weak bone. Although cement leakage, complications, and new fractures do occur in kyphoplasty, preliminary outcomes are promising (Karlsson, Hasserius, Gerdhem, Obrant, & Ohlin, 2005).

Pelvic and Acetabular Fractures

Whereas complex, unstable pelvic fractures are generally the result of high-energy trauma in younger patients, the elderly commonly sustain nondisplaced or minimally displaced fractures of the pubis rami. These fractures never require operative treatment, but they can be debilitating injuries that severely limit the patient's ability to ambulate. Despite the pain associated with these injuries, patients should be mobilized as quickly as possible, with weight-bearing as tolerated on the affected side. Healing of these fractures is often prolonged, with symptoms generally lasting several months.

Acetabular fractures are rare in the elderly, but when they occur, treatment can be difficult. Minimally displaced fractures can be treated with non–weight bearing on the affected extremity; the treatment of displaced fractures remains controversial, however (Toro, Hierholzer, & Helfet, 2004). It is not clear whether it is better to fix these displaced fractures operatively or to allow them to heal in a malreduced position and perform a delayed total hip arthroplasty. Traditionally, elderly patients were more likely to be treated conservatively with fracture consolidation and staged total hip arthroplasty, whereas younger patients were more likely to receive operative management. Recent trends are favoring a more aggressive surgical approach to acetabular fractures, even in the elderly population. Of course, the decision depends on many factors, including the nature of the fracture and the overall health of the patient.

Lower-Extremity Fractures

Ankle

Fractures about the ankle are relatively uncommon in the frail elderly, occurring more commonly in a younger, more active geriatric population. They are often the result of a twisting injury, and fracture of the distal fibula and tibia may be associated with dislocation of the ankle joint. Operative management is usually necessary, and fixation of the fragments can be difficult due to comminution and poor bone quality. Non–weight bearing on the affected ankle is required postoperatively. Stiffness of the ankle joint can be avoided with early range-of-motion exercises. Once healing has occurred, balance and proprioception training should be implemented.

Tibial Plateau

Fractures of the proximal tibia are the result of direct blows to the knee, usually sustained during a fall. Most often, the lateral tibial plateau is involved, and the fracture extends into the articular surface. In young patients, absolute anatomical reduction of these fractures is mandated to avoid degenerative arthritis; however, in the elderly, minimally displaced fractures can often be treated conservatively with a hinged knee brace and non–weight bearing on the affected leg. Because most of the load through the knee when walking or standing is through the medial compartment, small articular displacements of the lateral tibial plateau are relatively well tolerated.

If there is a large articular step-off or instability of the knee, operative treatment is necessary. As with most geriatric fractures, operative treatment can be technically challenging, because obtaining fixation of the screws in poor-quality bone is difficult. In addition, a bone graft is often needed, and autologous bone from the iliac crest is often of poor quality. Thus, synthetic bone-grafting materials must often be used. Failure of the operative fixation is not uncommon, with some collapse and angular deformity of the knee. As with tibial plateau fractures treated nonoperatively, even those fractures with significant deformity do reasonably well clinically. If pain in either group remains or becomes debilitating, a total knee replacement is indicated.

Hip

The morbidity and mortality associated with hip fractures are significant problems for the elderly. The treatment of the orthopedic injury and the subsequent care and rehabilitation of the patient place a heavy burden on the health care system. The majority of hip fractures occur in elderly patients with multiple concomitant medical problems. As the elderly population increases, so will the number of hip fractures and the cost of treating them. It is projected that by 2040, the number of hip fractures in the United States will double to more than 500,000 annually. Because the majority of patients sustaining hip fractures require hospitalization, the projected cost of their treatment and rehabilitation may exceed $16 billion.

Hip fractures are the result of a fall, often directly on the hip region itself. There are two distinct types of hip fractures: femoral neck fractures and intertrochanteric femur fractures. Surgical management with early mobilization has become the treatment of choice for most hip-fracture patients regardless of the type. However, the surgical management of the two types of hip fractures differs significantly because of the anatomy in this region.

Intertrochanteric fractures occur through a highly vascular trabecular bone bed and, as a result, will heal if the bone fragments are reduced and fixed appropriately. This is done operatively under radiographic control on a special fracture table. Historically, bone fragments were fixed with a large lag screw and a side plate on the lateral femur. However, intramedullary nailing has biomechanical advantages over the traditional methods and can be performed percutaneously (Kim, Kim, & Hwang, 2005; Lorich, Geller, & Nielson, 2004). Timing of surgery is not critical, but the patient's medical problems must be addressed before proceeding. Postoperatively, early mobilization is paramount, and the patient is taken out of bed on the first postoperative day. Ideally, most of these fractures should be treated with minimal weight-bearing on the affected side, but elderly patients often bear weight on the extremity when the pain is tolerable. This may lead to some shortening of the extremity and deformity of the fracture, but healing of the fracture is rarely compromised. In fact, in patients whose medical condition is deemed too poor for surgery, early mobilization to a chair can be instituted and the fracture will heal, albeit with shortening and some deformity. Rehabilitation of patients with intertrochanteric hip fractures tends to be slightly slower than for those with femoral neck fractures; the reason for this is unclear (Fox, Magaziner, Hebel, Kenzora, & Kashner, 1999).

Femoral neck fractures occur through the highly osteoporotic cortical bone of the femoral neck. There is little if any trabecular bone in this region. In addition, the blood supply to this region and thus to the femoral head is extremely tenuous. Thus, the treatment for these fractures differs from that of intertrochanteric fractures. Nondisplaced or minimally displaced fractures can be treated with fixation of the head to the neck in situ with cannulated screws under radiographic control. Even in these relatively minor fractures, there is a 10% chance that the blood supply to the femoral head will be significantly compromised, resulting in osteonecrosis or death of the bone of the femoral head. Postoperatively, patients should put only minimal weight on the affected side, but patients often bear weight as tolerated. There is no risk of dislocation.

Although displaced fractures of the femoral head can be reduced and fixed with cannulated screws, just like nondisplaced fractures, the incidence of osteonecrosis is high (i.e., 30% to 40%). The standard of care in the United States is to replace the head with a prosthesis, and this procedure is known as a hemiarthroplasty. Even though a total hip replacement may seem more appropriate, the dislocation rate has historically been high if the socket is replaced at the same time. Dislocation of a hemiarthroplasty is rare but possible; therefore, patients who have had a hemiarthroplasty should adhere to total hip precautions to prevent the likelihood of dislocation. Patients should avoid excessive flexion and internal rotation of the hip. While in bed, a pillow should be placed between the legs. Alternatively, a knee immobilizer can be placed on the knee because it is difficult to dislocate a hip if the knee is prevented from flexing. In addition, patients should avoid sleeping on the affected side and avoid low chairs and toilet seats. Because most of these prostheses are cemented into the femur, patients can safely place all their weight on the affected extremity.

Although the orthopedic surgeon may feel that the most important part of hip-fracture treatment is the operative intervention, the functional outcome of the patient is equally if not more dependent on good nursing and rehabilitation. Aggressive and long-term physical therapy has proved beneficial in restoring ambulatory function. Despite good post-operative care, patients on average lose a level of function after sustaining a hip fracture. The majority of patients do, however, return to the residences they occupied before their falls. Achievement of this goal requires an interdisciplinary team working to optimize the patient's return to pre-morbid function.

MATHIAS BOSTROM
JONATHAN A. ZELKEN

See also

Environmental Modifications: Home, Institutional
Falls Prevention
Hip Fractures
Osteoporosis

Internet Resources

American Academy of Orthopaedic Surgeons: Fractures
http://orthoinfo.aaos.org/fact/thr_report.cfm?thread_id=125&topcategory=about%20orthopaedics

Center for Disease Control and Prevention: Falls and Hip Fractures Among Older Adults
http://www.cdc.gov/ncipc/factsheets/falls.htm

Hospital for Special Surgery: Patient Information Regarding Fractures
http://www.hss.edu/Conditions/Fractures

REFERENCES

Fox, K. M., Magaziner, J., Hebel, J. R., Kenzora, J. E., & Kashner, T. M. (1999). Intertrochanteric versus femoral neck hip fractures: Differential characteristics, treatment, and sequelae. *Journals of Gerontology: Series A, Biological Sciences and Medical Sciences*, *54*(12), M635–M640.

Fulkerson, E., Egol, K. A., Kubiak, E. N., Liporace, F., Kummer, F. J., & Koval, K. J. (2006). Fixation of diaphyseal fractures with a segmental defect: A biomechanical comparison of locked and conventional plating techniques. *Journal of Trauma*, *60*(4), 830–835.

Gass, M., & Dawson-Hughes, B. (2006). Preventing osteoporosis-related fractures: An overview. *American Journal of Medicine*, *119* (4 Suppl. 1), S3–S11.

Karlsson, M. K., Hasserius, R., Gerdhem, P., Obrant, K. J., & Ohlin, A. (2005). Vertebroplasty and kyphoplasty: New treatment strategies for fractures in the osteoporotic spine. *Acta Orthopaedica*, *76*(5), 620–627.

Kim, S. Y., Kim, Y. G., & Hwang, J. K. (2005). Cementless calcar-replacement hemiarthroplasty compared with intramedullary fixation of unstable intertrochanteric fractures: A prospective, randomized study. *Journal of Bone & Joint Surgery*, *87*(10), 2186–2192.

Lorich, D. G., Geller, D. S., & Nielson, J. H. (2004). Osteoporotic pertrochanteric hip fractures: Management and current controversies. *Instructional Course Lectures*, *53*, 441–454.

Morley, P., Whitfield, J. F., & Willick, G. (2001). Parathyroid hormone: An anabolic treatment for osteoporosis. *Current Pharmaceutical Design*, *7*(8), 671–687.

Parker, M. J., Gillespie, W. J., & Gillespie, L. D. (2006). Effectiveness of hip protectors for preventing hip fractures in elderly people: Systematic review. *British Medical Journal*, *332*(7541), 571–574.

Rizzoli, R. (2006). Long-term outcome of weekly bisphosphonates. *Clinical Orthopaedics and Related Research*, *43*, 61–65.

Toro, J. B., Hierholzer, C., & Helfet, D. L. (2004). Acetabular fractures in the elderly. *Bulletin (Hospital for Joint Diseases, New York)*, *62*(1-2), 53–57.

U.S. Department of Health and Human Services (2004). *Bone health and osteoporosis: A report of the surgeon general.* Rockville, MD: U.S. Department of Health and Human Services, Office of the Surgeon General.

FUTURE OF CARE

Global aging and environmental deterioration are the most critical long-term, species-challenging issues facing the human race. These phenomena are linked through the growth of our population and the human impact on our planet, particularly global warming. Wars, epidemics, famines, and other disasters have happened and will happen again in the future, likely with increasing frequency as competition for resources, such as water and energy sources, heat up and ecosystems are increasingly challenged. A world filled with more older people and fewer younger ones will create opportunities for positive individual growth and cultural evolution, although intergenerational inequities will grow as a problem. How we choose to care for the children and the elderly in the future will affect not only the ethical legacy but also the actual viability of our species.

Planning for the future is a talent that is relatively well developed phylogenetically in human beings, but it will become more important in the future. The evolution of health care systems and our general approach to politics and other activities will be a balance between preserving what has worked in the past and developing new concepts and behaviors that will work in the future (Postrel, 1999). The very concept of health and disease will continue to change and influence how we establish both informal and formal systems for providing care (Whitehouse, Maurer, & Ballenger, 2000). Broad conceptions of health as biopsychosocial and even spiritual well-being suggest that we should look at similarly broad concepts such as quality of life as the desired outcome of health care. Lessons of the past and present from our own and from culturally different health care systems need to be considered carefully, as fundamental changes are occurring in our conceptions of health, disease, and health care systems. The popularity of alternative and complementary medicine (CAM) suggests that ill persons are seeking nontraditional health concepts and practices. Although not enough CAM is evidence-based (much of allopathic medicine is not evidence-based either), the concepts of personal control, environmental and community health, and holism are attractive to many. Human beings' remarkable flexibility in terms of conceptualizing health and protecting it in the past should serve as a positive model as we face the challenges ahead.

The field of biomedical ethics could become a more important focal point for social discussion, particularly if this field broadens its scope beyond the philosophical analysis of the implications of medical technology to explore the relationships between health and other values. Further research on health care systems is an important aspect of preparing for the future. However, the creation of volumes of data to devise new, expensive technologies is not the only kind of new knowledge we need. Attending to the integration of what we already know and the development of processes for making wise social decisions, often with incomplete information, will be important goals for scholarship and practice.

General Social Issues

In considering the future of care, one must ask the question: Who will we be caring for in the future? (The President's Council on Bioethics Panel, 2005). The simple answer is that we will be caring for more older people who have chronic diseases. We can also expect to be caring for them with sophisticated and powerful technologies provided by the revolution in molecular biology. The promise that we will be able to understand and manipulate our genetic makeup and to cure diseases such as Alzheimer's disease seems exaggerated and more likely to occur in the distant future, if at all.

Along with the aging of the population, a second major, long-term global trend is the deterioration of the environment (Orr, 1994). Environmental factors will likely cause more health problems for the elderly and others through the poor quality or inadequate quantity of water, air, and food. Public health will become even more important than in the past. The science of ecology—conceptually superordinate but politically weaker than molecular biology in medicine—should receive more emphasis because it is critical to our health improvement efforts.

How many resources will society allocate to the future care of the elderly? Questions about how much informal care is and should be provided by families and others and how much formal care should be provided by the health care system will continue to be answered in different ways in different cultures. The political will to support formal health care systems for the elderly will be challenged by the need to support other initiatives, such as improvement of the environment and the health and education of children. Societies may be challenged to ensure that the resources needed to care for older individuals do not outweigh the societal commitment to nurture younger generations. Intergenerational conflicts over resources can become a political issue at a time of resource scarcity; the total amount of resources committed to caring for the elderly and the young will depend on the economic well-being of the country. Yet, economic development depends, in part, on the educational level of children. If environmental deterioration continues, resources to support the economy will diminish. New approaches to modifying current conceptions of capitalism, including attention to natural resources in the economic equation—natural capitalism, for example—will be needed (Orr, 1994).

Information systems will be an important part of the world's future in relation to the economy and education. It remains to be seen whether the revolution in the distribution of knowledge and the associated shifts in social and economic power will benefit individuals within and among different societies. Information systems have the potential to diminish the digital divide between the haves and have-nots (Goodman, 1998). Many of these general social issues, such as the state of the economy and the environment, the political issues around resource allocation, and the development of information systems, will directly and indirectly affect health care systems.

Health System Issues

The major forces driving health care system change will continue to be population aging and chronic diseases. Dementia is not only a prototypical chronic disease but also one of the most common. It adds to the complexity of providing care, in that affected individuals have an impaired decision-making capacity, which means that other people must make health care and other decisions for them (Whitehouse et al., 2000; Whitehouse, In Press). Yet, we must challenge our current conceptions of age-related cognitive conditions and avoid the over-medicalization of aging. For example, the concept of so-called mild cognitive impairment (i.e., thinking difficulties not yet causing impairments in activities of daily living) illustrates the challenges of separating our normal aging from dementia, like Alzheimer's disease. The pressure from academics and pharmaceutical companies to create more disease categories and over-promise biological fixes must be recognized.

To address the growing number of older individuals with dementia and other chronic diseases, better integration of acute and chronic care systems is needed. Most of the investment in the future of health care has come from government and industry for the development of new, more effective, and more expensive technologies. The future will require the development of more psychosocial information systems and educational innovations rather than biological approaches to health care problems. In Norway, the development of so-called smart nursing homes that can monitor residents and control energy use and, in Japan, the use of robots for care are important trends to watch.

Evidence to justify social investment in various interventions should be sought, and the search should receive sufficient budgetary support. Biological and psychosocial interventions should be challenged to demonstrate through pharmaco-economic impact studies, such as cost-utility analysis, that they improve the quality of life and meet people's health care needs. However, our expectations should not be unreasonably high in geriatric patients who suffer from multiple chronic conditions. Therapeutic goals may be less clear than in single-disease situations. Efforts should continue to ensure that results of outcome studies are incorporated into practice. End-of-life care is a component of the health care system that needs further development. We need to be sure that such care reflects the values of individuals who are dying. Our desire to prevent death must be balanced by our concern that quality of life be preserved to the end. It is said that the best way to predict the future is to create it. Therefore, it is essential that all health care professionals, particularly those working in geriatrics, educate their patients and communities about the challenges ahead. If we continue to focus on biologically dominated and technologically oriented efforts to cure the chronic diseases of the elderly, out of proportion to the efforts needed to improve the health care system overall, the quality of life of older individuals may suffer. Aging is a worldwide phenomenon. We need to share the creation of health care systems that will serve current and future generations of older individuals, as well as the younger people who will care for their elders and who will eventually need such care themselves.

PETER J. WHITEHOUSE

See also

Environmental Modifications: Home, Institutional
Long-Term-Care Policy
Technology

Internet Resources

American Association of Retired Persons
http://www.aarp.org

American Geriatrics Society
http://www.american.geriatrics.org

Gerontological Society of America
http://www.geron.org

National Chronic Care Consortium
http://www.nccconline.org

National Institute of Aging
http://www.nih.gov/nia

REFERENCES

Goodman, K. (1998). *Ethics, computing, and medicine: Informatics and the transformation of health care*. Cambridge: Cambridge University Press.

Orr, D. (1994). *Earth in mind: On education, environment, and the human prospect*. Washington, DC: Island Press.

Postrel, V. (1999). *The future and its enemies: Growing conflict over creativity*. New York: Touchstone.

The President's Council on Bioethics Panel (2005). *Taking care: Ethical caregiving in our aging society*. Washington, DC.

Whitehouse, P. J. (In Press). Ethical issues in providing the care for individuals with Alzheimer's disease: Practice, education, and research. In *Caregiving Book Series, Rosalynn Carter Institute for Human Development*.

Whitehouse, P. J., Maurer, K., & Ballenger, J. B. (2000). *Concepts of Alzheimer disease: Biological, clinical, and cultural perspectives*. Baltimore: The Johns Hopkins University Press.

G

GAIT ASSESSMENT INSTRUMENTS

Evaluation of balance or movement disorders requires a thorough history and comprehensive physical examination. In particular, the patient history should focus on use of alcohol, benzodiazepines, neuroleptic agents, antihypertensives, and vasodilators. A complete physical examination, with emphasis on the musculoskeletal and peripheral and central nervous systems, as well as direct observation of gait, is often required to make a diagnosis (see Table G.1). When the diagnosis is not apparent, focused laboratory, electrodiagnostic, and imaging studies may be helpful.

The physical examination must include careful inspection of the lower limbs, including the feet, and evaluation of proprioception (i.e., position sense), vibratory sense, and tendon reflexes. Muscles should be evaluated for evidence of atrophy and weakness. Neuromuscular deficits alter skeletal alignment and create abnormally high forces to ligamentous structures usually at the midtarsal, subtalar, and knee joints. Structural abnormalities, such as joint ankylosis and leg-length discrepancies, can be easily identified during the musculoskeletal exam. The exam should also include an evaluation of cognitive function and mood.

Gait abnormalities associated with focal muscle weakness produce a characteristic pattern of movement during the gait cycle. A weak ankle dorsiflexor can be observed on physical examination, but it can often be heard as well because the foot "slaps" to the ground at heel strike. More pronounced weakness in this same muscle group produces a distinct steppage gait. Similarly, impaired knee extension, secondary to weak quadriceps muscles, can manifest as a "back knee," or genu recurvatum, followed by a "lurching" forward of the trunk to keep the line of gravity in front of the knee to prevent buckling.

Several neurological diseases likewise produce characteristic abnormalities. A flexed-forward, flat-footed, festinating gait coupled with neurological findings of rigidity, bradykinesia, masked facies, and resting tremor is classic for Parkinson's disease. Less specifically, a frontal gait abnormality suggests central nervous system pathology. A sensory ataxic gait characterized by a wide-based, high-stepping, or stamping walk, in association with loss of vibration and position sense, loss of reflexes, and a positive Romberg's sign, is characteristic of a gait disorder secondary to peripheral neuropathy.

Clinicians generally divide functional gait assessment into stance, forward progression, and swing. A gait cycle is defined as the time between two successive occurrences: from right-weight acceptance to right-weight acceptance. Stance phase involves 60% and swing phase includes 40% of the entire cycle. The majority of the body mass (70%) is in the head–arms—trunk and this mass progresses in a hypothetical line of progression and is balanced during ambulation on the lower extremities. To balance in ambulation, a stable base of support is needed.

The Tinetti Gait and Balance Measure (Tinetti, 1986) is a valid and reliable test of balance and gait abnormalities and is easily done in any setting. Balance maneuvers include nine positions and position changes that stress stability. Assessment includes rating the performance of eight activities in a serial fashion using simple criteria. The better a subject's performance, the higher is the score. The maximum score for balance is 16 and for gait is 12, yielding a maximum mobility score of 28.

The "Get Up and Go" Test (Mathias, Nayak, & Isaacs, 1986), performed in less than 2 minutes, examines an individual's ability to stand up from a chair, walk 10 feet, turn, walk back, and sit down again. Chair transfers (without the aid of armrests) are a reliable test of quadriceps and gluteal-muscle

TABLE G.1 Components of Gait Assessment

Assessment Components	Specific Aspects to Include
Patient History	Age, height, weight, diagnosis, prognosis, ambulation limitations, date of onset of the problem, goals, use of an assistive device, medications, usual activity level, past medical problems
Muscular and Neurological Evaluation	Motor deficits, strengths/weaknesses, muscle tone, proprioceptive deficits, range of motion limitations, coordination limitations
Static Alignment	Ask patient to stand in a relaxed, comfortable position with equal weight on both lower extremities and observe for normality*
Dynamic Alignment	Observation of the patient ambulating through stance and swing phase
Gait Speed	Use a stopwatch to time patients as they walk a few paces. Normal walking speed should be at least 1.0 meter per second (2.0 miles per hour).
Balance	Have patients hold three different stances for at least 10 seconds: (1) Have them stand with their feet together. (2) Have them to take a semi-tandem stance, with the heel of one foot touching the side of the big toe of the other foot. (3) Have them do a full-tandem stance with the heel of one foot directly in front of the other foot's toes. Abnormalities indicate a need for therapeutic interventions (therapy) and/or exercise.

* Normal position is standing straight ahead with shoulder and pelvis squared.

strength and balance. During the walking and turning maneuvers, body posture, upper-extremity movements, gait initiation, step length and height, step continuity and symmetry, width of base of support, walking velocity, deviation of path, and degree of sway or unsteadiness are observed and documented. Performance is rated on a scale of 1 to 5: no evidence of risk of falling is rated 1, moderately abnormal is rated 2, mildly abnormal is rated 3, very slightly abnormal is rated 4, and severely abnormal with risk of falling is rated 5.

The patient's ability to maintain balance over bases of support should also be evaluated: parallel, semi-tandem, tandem, and single-leg stance, progressing from the least difficult to the most difficult measures of balance. A positive Romberg's sign is indicative of altered proprioceptive and vestibular function, and a sternal nudge test (i.e., estimation of postural competence) should be performed.

Gait-analysis laboratories can quantify movement through the gait cycle. The data collected can be used to guide treatment strategies. Vestibular and balance laboratories can measure postural sway and righting reflexes. Computerized posturography may be helpful in determining the relative contribution of visual, vestibular, and proprioceptive abnormalities to postural instability (Maki, Holliday, & Topper, 1994) and explain why the patient responds in a particular way to postural challenges.

Tinetti Balance and Gait Evaluation

Balance

The subject is seated in a hard, armless chair. The following maneuvers are tested:

- Sitting balance
  - 0 = leans or slides in chair
  - 1 = steady, safe
- Arise
  - 0 = unable without help
  - 1 = able but uses arms to help
  - 2 = able without use of arms

- Attempts to arise
  - 0 = unable without help
  - 1 = able but requires more than one attempt
  - 2 = able to arise with one attempt
- Immediate standing balance (first 5 seconds)
  - 0 = unsteady (stagger, moves feet, marked trunk sway)
  - 1 = steady, but uses walker or cane or grabs other object for support
  - 2 = steady without walker or cane or other support
- Standing balance
  - 0 = unsteady
  - 1 = steady, but wide stance (medial heels more than 4 inches apart) or uses cane or walker or other support
  - 2 = narrow stance without support
- Nudge (subject at maximum position with feet as close together as possible; examiner pushes lightly)
  - 0 = begins to fall
  - 1 = staggers, grabs, but catches self
  - 2 = steady
- Eyes closed at maximum position
  - 0 = unsteady
  - 1 = steady
- Turn 360 degrees
  - 0 = discontinuous steps
  - 1 = continuous steps
  - 0 = unsteady (grabs, staggers)
  - 1 = steady
- Sit down
  - 0 = unsafe (misjudges distance, falls into chair)
  - 1 = uses arm or not a smooth motion
  - 2 = safe, smooth motion
  - ____ Balance Score

Gait

The subject stands with examiner, walks down a hallway or across the room, first at his or her usual pace, then back at a rapid but safe pace (using usual walking aids, such as a cane or walker).

- Initiation of gait (immediately after told to go)
  - 0 = any hesitancy or multiple attempts to start
  - 1 = no hesitancy
- Step length and height (right foot swing)
  - 0 = does not pass left foot with step
  - 1 = passes left foot
  - 0 = right foot does not clear floor completely with step
  - 1 = right foot completely clears floor
- Step length and height (left foot swing)
  - 0 = does not pass right foot with step
  - 1 = passes right foot
  - 0 = left foot does not clear floor completely with step
  - 1 = left foot completely clears floor
- Step symmetry
  - 0 = right and left step lengths not equal (estimate)
  - 1 = right and left step lengths appear equal
- Step continuity
  - 0 = stopping or discontinuity between steps
  - 1 = steps appear continuous
- Path (estimated in relation to floor tiles, 12 inches wide; observe excursion of one foot over about 10 feet).
  - 0 = marked deviation
  - 1 = mild to moderate deviation or uses a walking aid
  - 2 = straight without a walking aid
- Trunk
  - 0 = marked sway or uses a walking aid
  - 1 = no sway, but flexion of knees or back or spreads arms out while walking
  - 2 = no sway, no flexion, no use of arms, and no walking aid
- Walk stance
  - 0 = heels apart
  - 1 = heels almost touching while walking
  - ____ Gait Score
  - ____ Total Mobility Score (Balance + Gait)

BARBARA RESNICK

See also
Gait Disturbances

Internet Resources

International Society for Prosthetics and Orthotics
http://www.ispo.ca/member/files/lemaire-gait.pdf

American College of Physicians
wwws.acponline.org/journals/news/nov05/gait.htm

MedlinePlus
www.nlm.nih.gov/medlineplus/ency/article/003199.htm

Family Practice
www.aan.com/familypractice/pdf/FINAL%20GAIT%208.pdf

REFERENCES

Maki, B., Holliday, P., & Topper, A. (1994). A prospective study of postural balance and risk of falling in an ambulatory and independent elderly population. *Journals of Gerontology*, *49A*, M72–M84.

Mathias, S., Nayak, U. Y., & Isaacs, B. (1986). The Get Up and Go Test: A simple clinical test of balance in old people. *Archives of Physical Medicine & Rehabilitation*, *67*, 387–389.

Tinetti, M. E. (1986). Performance-oriented assessment of mobility problems in elderly patients. *Journal of the American Geriatrics Society*, *34*(2), 119–126.

GAIT DISTURBANCES

Changes in gait commonly accompany aging and can be indicative of health and biological age. Although up to 85% of adults ages 65 to 69 report no difficulty in walking, only 66% of individuals between 80 and 84 years of age and 51% of those older than 85 years of age report no difficulty (McGibbon, 2003). Of noninstitutionalized older adults with difficulty walking, 8% to 19% require the assistance of another person or special equipment.

Many older adults have musculoskeletal changes that influence gait, including kyphosis, scoliosis, or lower-extremity changes due to degenerative joint disease. Gait changes can also occur from muscle weakness, sensory changes, pain, or contractures. Minor alterations in gait can increase energy expenditure associated with ambulation and decreased activity. This further exacerbates the cycle by causing increased weakness and bone and muscle changes. Clinicians working with older adults must aggressively evaluate older patients for these problems, identify potentially treatable conditions, and provide the patient and family with appropriate interventions to compensate for changes.

Normal Age-Related Changes in Gait

Gait speed declines 0.2% per year up to age 63, after which it declines 1.6% per year (Laufer, 2005). Other characteristics of gait that change with aging include decline in step length, stride length, and ankle range of motion; decreased vertical and increased horizontal head excursions; decreased spinal rotation; decreased arm swing; increased length of double-support phase of walking; and reduced propulsive force generalized at the push-off phase.

The combination of decreased sensory input, slowed motor responses, and musculoskeletal limitations leads to increased unsteadiness or postural sway under both static and dynamic conditions. Older adults compensate for changes by using sensory input to augment proprioceptive loss.

Pathological Gait Disorders

Several common pathological gait disorders in older adults (see Table G.2) can occur singly or in combination. Abnormal patterns of movement may occur because of spasticity, weakness, or deformity, or the movement may compensate for other problems, such as dizziness or pain. Alterations in gait can also be compromised by cardiovascular, arthritic, and orthopedic disorders but are probably most commonly influenced by neurological disorders.

Neurological Problems

Approximately 15% to 30% of stroke survivors have chronic neurological deficits that impair gait and

TABLE G.2 Gait Disorders

Type of Gait	Description
Frontal lobe gait	Wide base of support Slightly flexed posture Small, shuffling, hesitant steps Poor initiation of gait; slipping-clutch syndrome Turns by pivoting both feet in a small circle Cannot control changes in base of support
Sensory ataxic gait	Wide-based stance; foot-stamping walk High step/stamping walk Heel touches first, then foot stamps Visual input used to ambulate Positive Romberg's sign
Cerebellar ataxic gait	Wide-based stance Small, irregular, unsteady steps Drunken veering and lurching Impaired trunk control Difficulty with tandem gait En bloc turning
Spastic gait	Swings affected leg slowly in outward arc; circumduction of the leg Legs trace a semicircle when walking Feet scrape the ground Scissoring occurs Short steps Narrow base
Spastic paraparesis	Legs move slowly and stiffly Short, labored steps with decreased hip and knee movement (bilateral circumduction) Toes scrape the ground Scissoring occurs Short steps Narrow base
Steppage gait	Feet are lifted high off the ground to prevent scraping toes Toes hit first, then heels Head is down to observe foot placement
Peripheral vestibular imbalance	Unsteady gait
Antalgic and gonalgic gait	Reluctant to put weight on the joint Heel strike avoided on affected foot Push-off avoided Decreased stance and swing phases of gait Decreased walking velocity Knee and foot flexed Decreased hip and knee extension Limp due to leg-length discrepancy
Podalgic gait	Pain with ambulation Toe contact occurs for three-quarters of the gait cycle
Dementia-related gait	Decreased walking speed Decreased step length Increased double-support time Increased step-to-step variability Increased postural sway Flexed posture Apraxic gait
Festinating gait	Symmetrical rapid shuffling of feet Trunk bent forward; hips and knees flexed Difficulty stepping
Parkinsonian gait	Festination Marche a petits pas; short, flat-footed shuffles Delayed gait initiation Body moves forward before feet Freezing Wide stance En bloc turning Loss of postural control Retropulsion; falls back in one piece like a log Propulsion
Waddling gait	Lateral trunk movement away from the foot, with exaggerated rotation of the pelvis and rolling of the hips Difficulty with stairs and chair rise
Vestibular ataxic gait	Broad based, with frequent sidestepping Drift toward the side of vestibular impairment Unsteady
Cautious gait	Flexed posture Decreased stride length Decreased walking speed Low center of gravity Wide base Short steps En bloc turning

balance (American Heart Association, 2007). Impairment depends on the size, location, and nature of the lesion. A stroke may result in hemiplegia, hemiparesis, or paraparesis that potentiates loss of muscle strength and proprioceptive input on the affected side. In hemiplegia, the affected leg is often stiff, slightly flexed at the hip, and extended at the knee, and the foot is plantar flexed. The affected arm is maintained in a position of flexion at the elbow. Weakness—for example, of the pretibial muscles—causes a foot drop that is most pronounced during the swing phase of gait. A "steppage" gait, with increased proximal lower-extremity flexion, is adapted to help clear the toes as the leg advances through swing; toe strike, as opposed to heel strike, occurs at the beginning of stance. In cases of partial weakness, there may be enough strength to dorsiflex the ankle and provide toe clearance during swing, but there will be an audible "slap" of the foot against the ground after heel strike.

Sequelae of stroke may include spasticity and alterations in muscle tone that can produce extensor and flexor synergies, often referred to as spastic hemiplegia. The extension synergy pattern includes hip and knee extension, internal rotation of the hip and plantar flexion, and inversion of the foot (i.e., equinovarus). The leg is functionally lengthened, requiring circumduction of the limb to clear the toes. Step length is shorter, stance time is longer, and the normal fluid pattern of gait is lost. Flexor synergy presents as a pattern of hip and knee flexion and ankle dorsiflexion, making ambulation difficult if not impossible. Adductor spasticity is sometimes seen and can result in a scissoring gait in which the affected extremity is pulled toward the midline.

Parkinson's disease affects 1% to 2% of individuals older than 60 years of age. A deficiency of dopamine, which functions as a neurotransmitter in the striatum and other related brain centers, results in the physical changes, cognitive dysfunction, and depressive symptoms that characterize Parkinson's disease. Typically, the gait pattern associated with Parkinson's disease is flexed forward, flat-footed, and festinating (i.e., hastening).

Peripheral neuropathy is a serious neurological complication of many common problems affecting older adults. Diseases of the three components of the peripheral nervous system—the nerve cell body (i.e., neuron), the axon, and the myelin sheath enveloping the axon—are described as neuronopathies, axonopathies, and myelinopathies, respectively. Peripheral neuropathies are classified as focal or multifocal and may influence a single nerve (i.e., mononeuropathy) or multiple nerves (i.e., mononeuropathy multiplex). When small myelineated and unmyelineated fibers are involved, there is decreased pain and temperature sensation. When large myelineated fibers are involved, there is areflexia and decreased vibration and position sense. For these individuals, the gait is ataxic and wide-based, and steps are high and stamping. Impaired joint proprioception and abnormal sensory feedback can result in forceful knee extension with a sometimes audible heel tap at heel strike, followed by a foot "stamp."

The degenerative changes of cervical spondylosis commonly result in cord compression in the elderly. Increased pressure on the spinal cord and nerve roots within the cord influences lower-extremity function. Gait is typically spastic and has elements of hip adduction, resulting in scissoring, plantar flexion manifested by reduced toe clearance (i.e., toes scraping the ground), and shortened, stiff-legged steps. Vitamin B_{12} deficiency can result in cord degeneration and myelopathy, in addition to a peripheral neuropathy.

Mild dementia can be associated with a nonspecific "cautious" gait characterized by a widened base of support, shortened stride length, flexed posture, and slow gait speed; movement is "en bloc." More severe dementia typically presents as a frontal lobe gait with poor gait initiation, small shuffling steps, and impaired equilibrium.

Orthopedic Problems

Structural abnormalities that can affect gait include limb-length discrepancy, joint ankylosis, contractures, and a variety of arthritic and foot conditions. A leg-length difference of more than 1.5 inches causes a person to walk on the forefoot of the shorter leg to functionally increase its length. Hip hiking or circumduction occurs on the swing side to compensate. Painful or antalgic joints generally cause a shortened stance time on the affected side in an effort to minimize painful weight-bearing. The altered gait pattern in hip pain resembles a compensated Trendelenburg gait, with the shoulder of the affected side dipped laterally during stance. Arthritis and other painful conditions of the feet can cause a shuffling, flat-footed gait, with decreased heel strike and little or no rollover.

Medications

A variety of medications can influence gait. The major drug groups include sedating psychotropic medications such as benzodiazepines, tricyclic antidepressants, phenothiazines, anticonvulsants, salicylates, and antivertigo agents. Any medication that causes orthostatic hypotension can impair balance and thereby alter gait.

Idiopathic Senescent Gait Disorder

In 18% of those in the community with gait disorders, no specific disease-related cause can be identified (Bloem, Haan, & Lagaay, 1992). These individuals are believed to have an idiopathic senescent gait disorder with a gait pattern that is broad-based with small steps, diminished arm swing, stooped posture, flexion of the hips and knees, uncertainty and stiffness in turning, occasional difficulty initiating steps, and a tendency to fall. Only when clinical and laboratory examinations fail to reveal any specific cause can the diagnosis of an idiopathic senescent gait disorder be made.

Treatment of Gait Disturbances

A rehabilitation team approach to the treatment of gait abnormalities is commonly employed. Goals of treatment include appropriate pharmacological intervention; improved functional mobility, strength, and endurance; prevention of deformity; and development of a safe, energy-efficient gait pattern. Some gait abnormalities can be substantially improved with medications, physical therapy, or both.

Orthotics and assistive devices can greatly improve gait; they provide additional sensory input and can supplement muscle activity. Regular exercise, such as walking for 20 minutes at least three times a week or performing resistive exercises that focus on strengthening the lower extremities, has repeatedly been demonstrated to improve gait and balance (DiBrezzo, Shadden, Raybon, & Powers, 2005; Toraman, Erman, & Agyar, 2004; Wolf et al., 2003) even among frail older adults (Lord et al., 2003). All older adults should be encouraged to exercise because doing so will prevent further decline in gait and improve gait speed and safety.

BARBARA RESNICK

See also

Balance
Falls Prevention
Foot Problems
Gait Assessment Instruments

Internet Resources

American College of Physicians
wwws.acponline.org/journals/news/nov05/gait.htm

Gait and Movement Disorders: Family Practice
www.aan.com/familypractice/pdf/FINAL%20GAIT%208.pdf

REFERENCES

American Heart Association. Heart Disease and Stroke Statistics—2007 Update *Circulation*. 2007;115:e69-e171.

Bloem, B., Haan, J., & Lagaay, A. (1992). Investigation of gait in elderly subjects over 88 years of age. *Journal of Geriatric Psychiatry & Neurology, 5*, 78–84.

DiBrezzo, R., Shadden, B. B., Raybon, B. H., & Powers, M. (2005). Exercise intervention designed to improve strength and dynamic balance among community-dwelling older adults. *Journal of Aging and Physical Activity*, *13*(2), 198–209.

Laufer, Y. (2005). Effect of age on characteristics of forward and backward gait at preferred and accelerated walking speed. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *60*, 627–632.

Lord, S. R., Castell, S., Corcoran, J., Dayhew, J., Matters, B., Shan, A., et al. (2003). The effect of group exercise on physical functioning and falls in frail older people living in retirement villages: A randomized, controlled trial. *Journal of the American Geriatrics Society*, *51*(12), 1685–1692.

McGibbon, G. (2003). Toward a better understanding of gait change with age and disablement. *Exercise Sport Science Review*, *31*(2), 102–108.

Toraman, N. F., Erman, A., & Agyar, E. (2004). Effects of multicomponent training on functional fitness in older adults. *Journal of Aging and Physical Activity*, *12*(4), 538–553.

Wolf, S. L., Barnhart, H. X., Kutner, N. G., McNeely, E., Coogler, C., & Xu, T. (2003). Atlanta FICSIT Group (2003). Reducing frailty and falls in older persons: An investigation of tai chi and computerized balance training. *Journal of the American Geriatrics Society*, *51*(12), 1794–1803.

GASTROINTESTINAL BLEED

Gastrointestinal (GI) bleeding emergencies in the elderly require rapid diagnosis and aggressive intervention because of the wide range of etiologies of bleeding and the significant potential for adverse outcomes. Co-morbid conditions and decreased physiologic reserve make persons 65 and older particularly vulnerable to the adverse consequences of acute blood loss. Thus, GI bleeding in the elderly is a significant clinical challenge. In an acute GI bleed, the primary initial clinical concern should be achieving and maintaining hemodynamic stability.

Common variables implicated in GI bleeding include normal aging, cancer, chronic use of nonsteroidal anti-inflammatory agents (NSAIDs) or other medications, vascular abnormalities, inflammatory bowel disease, GI carcinomas, diverticulosis, peptic ulcers, and hemorrhoids. Cirrhosis arising from chronic alcohol abuse or chronic viral hepatitis can result in bleeding esophageal or gastric varices. Depending on the location in the GI tract of the bleed, a patient may vomit bright red or coffee ground-like material, or pass tarry, malodorous stools, mahogany-colored stools, or bright red blood per rectum. Long-term bleeding may result in symptoms of anemia. Persons who have sustained substantial blood volume loss more than 40% of their normal total are likely to exhibit tachycardia, low blood pressure, reduced urine output, and pallor. These patients need immediate volume replacement.

Acute Upper GI Bleeding

As many as 45% of all cases of acute upper GI bleeding occur in patients age 60 and older (Farrell & Friedman, 2001). Upper GI bleeding results in death among patients age 65 and older 4 to 10 times more often than in younger patients. Older patients are more likely to present with more proximal, larger gastric ulcers that are prone to perforate and are slower to heal. Older patients are more likely to re-bleed acutely from ulcers, and at least one-half of patients older than age 70 with peptic ulcer experience complications. Older patients are more likely to have bleeding lesions due to NSAID use, which is probably due to age-related gastric mucosa susceptibility to NSAID damage rather than to more prevalent NSAID use. The intake of prescription and over-the-counter (OTC) NSAIDs in older persons is as high as 64%, and this population usually underreports NSAID use.

In an older patient, emesis of any material exhibiting the texture of coffee grounds or containing blood requires immediate evaluation. Melena in any patient is considered to be a sign of upper GI bleeding until proven otherwise. Concurrent vascular disease increases the risk of cardiac ischemia when GI bleeding is brisk. Initial lab studies are vital in guiding intervention because renal failure, thrombocytopenia, or medications may compromise the coagulation system in older patients. GI bleeding in patients taking warfarin or ticlopidine can be more rapidly life-threatening than a thrombotic event.

Risk factors for mortality include concurrent NSAID use, patients requiring more than 5 units of packed red blood cell (PRBC) transfusion, peptic ulcer as a cause of bleeding, and co-morbidities including renal, cardiac, pulmonary, and liver disease.

Treatment

The first goal of care is achievement of hemodynamic stability (Farrell and Friedman, 2001). Intravenous proton pump inhibitors are also initiated. Placement of a nasogastric (NG) tube can provide some useful information but has not been shown to affect outcome and is not routinely encouraged (Rockey, 2005). Serious upper GI bleed is not excluded by NG aspirate that is free of blood or coffee-grounds material. In 10% to 15% of cases, NG lavage is clear, even in the presence of active bleeding (usually duodenal ulcer bleeding).

Emergency upper endoscopy discloses the source of bleeding in up to 95% of patients and offers therapeutic control of bleeding in addition to diagnostic localization of a bleeding lesion. Hemostasis is achieved through different modalities, including electrocautery of a bleeding ulcer or angiodysplasia, sclerotherapy with epinephrine to provide local vasoconstriction, placement of a hemostatic clip across a bleeding vessel, or, in the case of esophageal varices, band ligation. Successful hemostasis through invasive endoscopic therapy is achieved in 90% of patients.

Outpatient care of patients after upper GI bleeding involves maintenance antisecretory therapy, preferably with a proton pump inhibitor. *Helicobacter pylori* infection should be treated if found in patients with peptic ulcer disease. Patients with gastric ulcer bleeding should be reexamined 6 to 8 weeks after the initial bleeding episode to document healing because of the malignant potential of gastric ulcers. Patients who have bled from esophageal varices need portal antihypertensive therapy and repeat endoscopic banding to fully eradicate the varices.

Acute Lower GI Bleeding

The most common cause of major or acute lower GI hemorrhage is bleeding colonic diverticula; angiodysplasia are also common (Farrell & Friedman, 2001). The most common causes of chronic lower GI bleeding are hemorrhoids or colonic neoplasms. Most patients experiencing acute lower GI bleeding will exhibit bright red rectal bleeding. Rectal bleeding in the older patient is likely due to ischemic colitis, diverticular disease, colon cancer, and arteriovenous malformations. Prior abdominopelvic irradiation can lead to bleeding from radiation colitis years later. Approximately 10% to 15% of all cases of rectal bleeding are attributable to a cause that is proximal to the ligament of Treitz. Benign anorectal disease and postpolypectomy bleed also account for lower GI bleeding. Daily fecal blood loss required to cause guaiac-positive brown stool is approximately 20 cc. Normal daily fecal blood loss is approximately 2 cc. Fecal blood loss required to cause melena is at least 50 cc.

Ischemic colitis

Ischemic colitis is more common in patients with atherosclerotic vascular disease, where it is frequently heralded by crampy lower abdominal pain that resolves spontaneously before painless hematochezia (i.e., frank bright red blood per rectum) begins.

Diverticular disease

Nearly one-half of patients with diverticular disease experience episodic painless minor hematochezia; approximately 5% of these patients will experience hemodynamically significant lower GI bleeding that requires blood transfusion. Bleeding stops spontaneously in about 80% of patients who develop significant lower GI bleeding. Approximately 20% of patients with massive diverticular bleeding will have recurrent hemorrhage. The precise trigger of the bleeding is unclear.

Other causes

Bleeding from colonic vascular ectasias (angiodysplasias) is highly variable in severity and manifestations. Hematochezia resulting from colon cancer is often accompanied by weight loss, change in bowel habits, change in stool caliber, and anemia. Lower GI bleeding in the presence of active abdominal pain places inflammatory bowel disease in the differential diagnosis. Evaluation of material passed via the patient's rectum (i.e., dark blood mixed with stool, stool coated with red blood, melena) may help determine the site of bleeding, rapidity, and the quantity of blood involved.

Endoscopic evaluation can occasionally be useful in identifying the source of bleeding. However, it is often difficult to localize the single "culprit" bleeding diverticulum in a colon that is filled with fresh blood and multiple large diverticulae. If a bleeding diverticulum is localized at the time of colonoscopy, then injection around the area with epinephrine to cause vasoconstriction has been shown to have some success in controlling bleeding. Placing a hemostatic clip across the mouth of the bleeding diverticulum, which tamponades the active vessel, has also been shown to be effective. Bleeding colonic (or gastric) angiodysplasias are usually easily controlled during colonoscopy (or endoscopy) through the use of electrocautery applied directly through the colonoscope (or endoscope).

Nuclear scanning using radionuclide-tagged red blood cells can detect sources of colonic bleeding at rates as low as 0.1 cc blood per minute. This modality, which is completely noninvasive and does not cause nephrotoxicity, can be quite helpful as a confirmatory study prior to surgical resection of the putative bleeding site.

Selective mesenteric arteriography can detect hemorrhage at a rate of 0.5 to 1 mL/minute and can provide hemostatic therapy via intra-arterial infusion of vasopressin or embolization of the bleeding arterial vessel with gel-foam or microscopic coils. The morbidity of arteriography is considerably less than that of urgent hemicolectomy or subtotal colectomy. However, patients with renal impairment typically cannot undergo studies with contrast dye, and elderly patients, because of their lower glomerular filtration rate, may be at greater risk for renal complications from arteriography.

Bleeding lesions in the small intestine (i.e., angiodysplasia, tumors, and Crohn's disease are the most common etiologies) are now much easier to diagnose as a result of the availability of video capsule endoscopy. This newer technology involves the swallowing of a capsule camera that is the size of a large multivitamin. This capsule contains a LED light source, camera, and transmitter, which sends two images per second via an antenna array worn taped to the skin to a recording device, which downloads a videostream to a computer for physician review. The technology also allows rough localization of the lesion in the small bowel using a positioning system, which can direct definitive therapy.

Roger D. Mitty

See also
Bowel Function
Fecal Incontinence
Gastrointestinal Diseases
Gastrointestinal Physiology

Internet Resource
American Gastroenterology Association
http://www.gastro.org

REFERENCES

Farrell, J. J., & Friedman, L. S. (2001). Gastrointestinal bleeding in the elderly. *Gastroenterology Clinics of North America*, *30*(2), 377–407, viii.

Rockey, D. C. (2005). Gastrointestinal bleeding. *Gastroenterology Clinics of North America*, *34*(4), 581–588.

GASTROINTESTINAL DISEASES

Hiatus Hernia and Gastroesophageal Reflux Disease

A hiatus hernia (HH) is a prolapse of a portion of the stomach through the diaphragmatic esophageal hiatus up into the chest cavity. Although the presence of a HH may predispose to gastroesphageal reflux disease (GERD), not all patients with HH will actually have acid reflux.

The most common type of HH is a sliding or axial hernia (type I), accounting for more than 95% of cases. In a paraesophageal hernia (type 2), accounting for up to 5% of cases, the esophagogastric junction is located in the normal intra-abdominal location; a portion of the stomach with the peritoneum is pulled into the thoracic cavity through the phrenoesophageal ligament.

One of the most common abnormalities of the gastrointestinal tract seen in the Western world, HH is found in approximately 50% of individuals older than age 50, more commonly in women than men. The higher prevalence in the Western world may be related to a relatively low fiber diet that may result in increased intra-abdominal pressure during defecation.

Many patients are either asymptomatic or may have vague symptoms, including epigastric or substernal pain, postprandial fullness, substernal fullness, nausea, and retching. Bleeding, overt or occult, as a complication of HH has been reported, and iron deficiency anemia can develop. Diagnosis of HH can be made with radiologic, endoscopic, or manometric examinations. Upper endoscopy is now the most common modality used to make the diagnosis of HH.

GERD is the most common clinical manifestation of a hiatal hernia. Gastroesophageal reflux results when the physiologic barrier between the stomach and esophagus, the lower esophageal sphincter, fails to function normally. It is more common in the elderly and may not present with classic symptoms (Holt, 2003).

Reflux symptoms can be related to large or high fat meals and worsened by bending over or lying down. Odynophagia, dysphagia, bleeding, weight loss, and anemia may indicate strictures (either benign or malignant), esophagitis, or esophageal ulceration.

The diagnosis of GERD may be made by a history of classic symptoms and a successful trial of medical therapy and/or lifestyle changes. Further diagnostic investigation may be warranted if esophageal symptoms do not respond to medical management. Endoscopy is preferred for suspected complications and to rule out Barrett's esophagus. Barium studies are neither sensitive nor specific. For those with symptoms despite acid suppression and negative endoscopic findings, ambulatory pH reflux monitoring is highly sensitive and specific. Ambulatory pH testing by a radiotelemetry capsule that is placed in the esophagus is also available. Esophageal manometry can be used to diagnose motility disorders like scleroderma and achalasia, which may have symptoms that are difficult to distinguish from GERD.

As part of any treatment plan, patients should be encouraged to implement lifestyle modifications. These include smoking cessation, elevation of the head of the bed, low-fat diet, avoiding late or large meals and foods that decrease lower esophageal sphincter pressure (e.g., chocolate, alchohol, peppermint, and coffee), and keeping upright posture for 3 hours or more after meals. Pharmacologic therapies for patients with mild, intermittent symptoms may begin with over-the-counter (OTC) medications such as antacids and antirefluxants (e.g., alginic acid) on an as needed basis. For more severe cases, initial therapy with a proton pump inhibitor is generally employed, with a "step down" to histamine receptor antagonists or antacids as maintenance therapy. Patients should not self-medicate for more than 2 weeks without further physician evaluation because of the risk of Barrett's esophagus and other complications. For acid suppression in patients with chronic or complicated GERD, promotility agents can serve as an adjunct. Because GERD is a chronic, relapsing condition, maintenance therapy should be continued at the lowest effective dose. The role of surgery in those whose symptoms are refractory to medical treatment is controversial.

Diverticular Disease

Diverticular disease is limited almost entirely to the middle-aged and elderly populations. Diverticulosis refers to the presence of one or more diverticula. Diverticulitis is an inflammatory condition that involves one or more colonic diverticula and is almost always symptomatic.

The presence of colonic diverticula increases to approximately 30% in people older than age 50, 50% older than age 70, and as much as 66% in octogenarians. More than three-fourths of all diverticulosis occurs exclusively in the sigmoid colon; the sigmoid is involved in more than 90% of all cases. Most (i.e., 80% to 85%) patients are asymptomatic. In patients who present with symptoms, about 75% present with painful diverticular disease; 25% present with diverticulitis or bleeding.

The predominant symptom in painful diverticular disease is colicky or steady left-lower quadrant abdominal pain, usually exacerbated after meals and improved by the passage of flatus or by a bowel movement. Physical examination is often unremarkable.

Diverticulitis

Inflammation of one or more diverticula and pericolic tissues is the most common complication of diverticulosis. The incidence of diverticulitis increases with the duration of the preexisting diverticulosis and with the age of the patient. The site of inflammation and perforation is almost always the sigmoid colon. The pain of acute diverticulitis is characteristically severe, persistent, abrupt in onset, and may be accompanied by anorexia, nausea, vomiting, and fever. Physical examination may reveal localized tenderness in the left-lower quadrant. Of the patients with diverticulitis, 25% have occult rectal bleeding.

The classical presentation of acute diverticulitis as described may be greatly altered in the elderly. The symptoms and signs are much less prominent. A high index of suspicion is thus required to diagnose diverticulitis in many elderly patients with acute abdominal or pelvic complaints. The total clinical picture may be muted in elderly patients even when the disease is severe.

Treatment of acute diverticulitis in the elderly patient requires hospitalization. Conservative medical therapy is the first line of treatment and consists of broad-spectrum antibiotics with coverage against gram-positive and gram-negative organisms, a clear liquid diet, or complete bowel rest (nothing by mouth,), as well as IV hydration). With a conservative medical regimen, at least 75% of patients will respond.

Signs of worsening inflammation or lack of response to treatment should be considered indications for surgery to excise the inflamed segment of the colon. A two-stage procedure is necessary in most elderly patients. The first stage involves resection of the colonic segment containing the inflamed diverticulum with a diverting colostomy proximal to the resection. The second stage is takedown of colostomy and anastamosis for intestinal continuity.

Diverticular Bleeding

Bleeding from diverticula is the most common cause of major gastrointestinal-tract hemorrhage in the elderly. About 10% to 25% of patients with known diverticular disease will have bleeding per rectum at some point. In contrast to diverticulitis, which almost always occurs in a single diverticulum in the left colon, two-thirds of cases of diverticular bleeding occur in the right colon. Classically, the presentation is of sudden, mild, lower abdominal discomfort, rectal urgency, and the subsequent passage of large amounts of maroon or bright red bloody stool. Most patients will stop bleeding spontaneously (Martinez, 2006). The recurrence rate of 10% to 25% increases with each further attack of diverticular bleeding.

The treatment of diverticular bleeding should begin with conservative medical management (Ferzoco, Raptopoulos, & Silen, 1998). The patient should be hospitalized, with bed and bowel rest, blood transfusion, and correction of coagulopathy when present. Persistent active bleeding defined by angiography may be treated with intra-arterial vasopressin or local embolization. Surgical resection of diverticula-containing areas of the colon must be considered on an elective basis in patients with recurrent hemorrhages. In an elderly patient, the risk of surgery, especially if emergent, is considerably greater than in younger patients; thus, the decision to undertake surgery must consider the patient's overall status.

Ischemic Disease of the Bowel

Ischemic bowel diseases are a heterogeneous group of disorders usually seen in elderly individuals. They represent ischemic damage to different portions of the bowel and, therefore, produce a variety of clinical syndromes and outcomes. The most common of these disorders, colonic ischemia or ischemic colitis, has a favorable prognosis.

Ischemic colitis

Ischemia of the colon is the most common vascular disorder of the intestines in the elderly. More than 90% of individuals with colonic ischemia are older than age 60 and have evidence of widespread atherosclerosis. In most cases, no specific inciting event for the episode is identified. Factors that may predispose the colon to ischemic injury are an inherently low blood flow and an additional decline in perfusion associated with functional motor activity. Constipation in elderly patients may further exacerbate colonic circulatory inadequacy secondary to the effects of straining at stool on systemic arterial and venous pressure.

Ischemic colitis usually presents with sudden, mild, crampy, left-lower quadrant abdominal pain followed by bloody diarrhea or bright red blood per rectum within 24 hours. Usually bleeding is not massive; severe hemorrhage suggests another diagnosis. On physical examination, mild to moderate abdominal tenderness may be elicited over the involved segment of the bowel. The splenic flexure, descending, and sigmoid colon are the most common sites of ischemic injury. If signs of peritoneal irritation persist, this indicates potentially catastrophic transmural necrosis.

Thumbprints, or pseudotumors, which disappear on subsequent plain films of the abdomen, are the major radiographic criteria for the diagnosis of ischemia. Thumbprints represent submucosal and mucosal hemorrhages and are present only in the acute stage of ischemic colitis. A CT scan is the initial diagnostic procedure of choice and will demonstrate diffuse thickening of the colon suggestive of colitis. Colonoscopy or sigmoidoscopy are not absolutely indicated but may be useful to differentiate ischemic colitis from other forms of colitis, such as inflammatory bowel disease. Caution is advised in performing colonoscopy in any patient with acute colitis and therefore should only be entertained in the acute setting if the diagnosis is truly in question.

Treatment of acute ischemic colitis is based on early diagnosis and continued monitoring. Once gangrene or perforation is ruled out, the patient is treated noninterventionally with close observation. If clinical deterioration occurs, surgical resection should be considered. The extent of resection should be guided by the distribution of disease as revealed by preoperative studies rather than by the appearance of the serosal surface or the colon at the time of operation because the mucosal injury may be extensive despite a normal appearance of the serosa.

In more than 70% of patients, colonic ischemia is self-limited and in most patients, ischemic colitis is a solitary event. Only 5% of patients experience recurrent episodes. Generally, the symptoms resolve in 24 to 48 hours and the colon heals in 2 weeks. In severe disease, complete healing may require up to 6 months. In less than 30% of patients with ischemic colitis, irreversible damage occurs, including gangrene and perforation, segmental ulcerating colitis, and the development of colonic stricture. Hemodynamic support encompassing the avoidance of hypotension through adequate hydration and the elimination of unnecessary antihypertensive medications is the main thrust of care.

Patients with few or no symptoms but who have endoscopic evidence of persistent disease should have a follow-up colonoscopy approximately 6 weeks after initial detection to determine whether the colon is healing. Ischemic strictures without symptoms should be observed, but resection is required for those causing obstruction. Patients with persistent symptoms for more than 2 weeks are at high risk for colonic perforation, and early resection is indicated. As with other forms of vascular disease, lifestyle modification, such as smoking cessation, is strongly encouraged.

Older Patients

The elderly are commonly affected by many of the same gastrointestinal disorders that involve younger patients. However, diminished physiologic reserve and polypharmacy often make management of these diseases more difficult in the older population. The approach to these diseases is, in many cases, through interventional procedures. This approach must be tempered by the individual patient's overall performance status, the patient's cardiopulmonary status, other co-morbidities, and finally, in the case of life-threatening situations—such as hemorrhage—the patient's end-of-life wishes.

Roger D. Mitty

See also

Bowel Function
Fecal Incontinence
Gastrointestinal Bleed
Gastrointestinal Physiology

Internet Resource

American Gastroenterology Association
http://www.gastro.org

REFERENCES

Ferzoco, L. B., Raptopoulos, V., & Silen, W. (1998). Acute diverticulitis. *New England Journal of Medicine*, *338*(21), 1521–1526.

Holt, P. R. (2003). Gastrointestinal diseases in the elderly. *Current Opinion in Clinical Nutrition and Metabolic Care*, *6*(1), 41–48.

Martinez, J. P. (2006). Abdominal pain in the elderly. *Emergency Medicine Clinics of North America*, *24*(2), 371–388, vii.

GASTROINTESTINAL PHYSIOLOGY

As in the younger population, gastrointestinal (GI) complaints lead to a significant percentage of primary care provider and hospital visits in the elderly population. Age-related changes in the GI tract may make "common" diseases such as peptic ulcer or diverticulitis more severe. The elderly patient who has less physiologic reserve may tolerate GI emergencies, such as hemorrhage, far more poorly than a younger patient with the same lesion.

Physiologic Changes in the GI Tract

Esophagus

Age-related changes in esophageal motility are often termed *presbyesophagus*. These include, among others, changes in upper and lower esophageal sphincter function and repetitive tertiary contractions of the esophagus (Firth & Prather, 2002). Barium studies indicate that pharyngeoesophageal function appears to change with age involving pharyngeal hypotonicity, incomplete opening of the cricopharyngeus muscle, pooling of barium in the pyriform sinuses, or aspiration of barium. This may lead to the complaint of dysphagia or result in episodic aspiration pneumonia. Diminished amplitude of esophageal peristaltic contractions, delayed esophageal emptying, and incomplete lower esophageal sphincter relaxation make gastroesophageal reflux disease (GERD) of concern in the elderly. Elderly patients, such as those in long-term-care facilities, who spend a large percentage of the day recumbent may be at greater risk for complications of GERD (e.g., erosive esophagitis) because the usual effect of gravity during eating is negated.

Stomach

Gastric motility and gastric emptying diminish progressively with age. The widespread prevalence of *Helicobacter pylori*, which can cause chronic gastritis and gastric atrophy (Newton, 2004) has made it difficult to ascertain the exact relationship between aging and achlorhydria. Gastric mucosal surface hydrophobicity does appear to decrease with aging (Newton, 2004) and may contribute, along with NSAID use and H pylori infection, to the increased risk of ulcer disease. Mucosal repair also is reduced with age.

Small intestine

Poor nutrition in the elderly is not related solely to diminished intake but also to altered intestinal function. Increased frequency and severity of GI infections due to altered intestinal immune function is seen with aging. Carbohydrate malabsorption has been documented using the standard d-xylose test. Fat and protein absorption have not been well studied.

Colon

Constipation is possibly the most frequent digestive complaint of the elderly. The contribution to constipation of altered colonic motility remains unclear; in general, colonic transit time is not altered by aging (Firth & Prather, 2002). In addition to inactivity, numerous medications, such as anticholinergics and narcotic analgesics, are known to affect colonic motility. Anorectal function is also impaired. Studies have demonstrated decreased rectal elasticity and capacity and significant diminution in internal anal sphincter function with aging in both men and women.

Liver

Liver size and hepatic blood flow both decrease progressively with age. Hepatic parenchymal fibrosis is observed, but this fibrosis appears to have no functional significance. Geriatric patients have two to three times the frequency of untoward drug effects compared with the general population. The liver metabolizes several classes of drugs; because this metabolism slows with aging, elevated serum drug levels may be noted with "standard" dosing. Examples of such drugs include seizure medications such as phenytoin or carbamazepime, antidepressants such as fluoxetine, and the anticoagulant warfarin. Observations of pharmacokinetic changes with aging are confounded by co-morbidity in elderly patients.

Roger D. Mitty

See also

Bowel Function
Fecal Incontinence
Gastrointestinal Bleed
Gastrointestinal Diseases

Internet Resource

American Gastroenterology Association
http://www.gastro.org

REFERENCES

Firth, M., & Prather, C. M. (2002). Gastrointestinal motility problems in the elderly patient. *Gastroenterology*, *122*(6), 1688–1700.

Newton, J. L. (2004). Changes in upper gastrointestinal physiology with age. *Mechanisms of Ageing and Development*, *125*(12), 867–870.

GAY AND LESBIAN AGING

Little research literature addresses gay and lesbian aging. Although we know that the number of old people has dramatically increased, the exact number of old gay and lesbian adults is difficult to determine. First, the definition of who is gay or lesbian is a complicated one. Some studies attribute sexual orientation based on current behavior, others go by self-definition, and still others rely on past experience. Many of the oldest gay and lesbian adults do not define themselves in the same way that younger cohorts might use the label.

Cahill, South, and Spade (2000) cite studies that place the numbers of gay and lesbian older adults anywhere from 3% to 13% of the total population. If the senior population is equal to what has been found in younger groups, the gay and lesbian aging population is somewhere between 1 million to 2.8 million individuals. By 2030, gay and lesbian seniors could number as high as 6 million.

One of the critical issues to consider when examining aging and sexual orientation is that not all gay and lesbian people are alike, just as not all old people are all alike. In fact, Quam & Whitford (1992) suggest that in some ways, old lesbians are more like other old women than they are like old gay men. Gender differences may be more predictive of health and income in old age than sexual orientation.

The age at which one was born may be significant in considering one's relative comfort or degree of being "out" as a gay or lesbian person. For example, a person born in the early 1900s experienced a society that defined being gay or lesbian as immoral, illegal, or simply wrong. Many people lost jobs or were ostracized by family and friends because their sexual identity became known. It was not until they were in their 70s or 80s that they started to see some things change. "Homosexuality" was removed as a clinical diagnosis by the American Psychological Association in 1973.

The younger cohorts of adults who are now reaching the young old stage (i.e., older than age 55) have had a different experience. This group, sometimes referred to as the post-Stonewall generation, has seen public figures define themselves as gay, major television and movie stars (i.e., Ellen DeGeneres and Rosie O'Donnell) acknowledge that each is a lesbian, and a successful television show featuring two gay men (i.e., "Will and Grace"). Domestic partnership benefits are offered to gay and lesbian couples at major universities and well-established corporations. Same-sex marriage is one of the most publicly debated issues of our times. And, more recently, a major motion picture (i.e., *Brokeback Mountain*) featured a lifelong love affair between two men.

This younger cohort has seen far more social services that are specifically designed for gay and lesbian adults and their families. Churches and synagogues reach out to gay and lesbian members to be more inclusive. As they age they will likely be more comfortable openly defining themselves as gay and lesbian and seeking services that, if not solely identified as targeted for gays and lesbians, are at least sensitive to their needs.

Health

This population feels marginalized by the health care system. A study in Canada (Brotman, Ryan, & Cormier, 2003) found that lifelong experiences of marginalization and oppression caused older gays and lesbians to mistrust the health care network. This was true despite recent legislative and social policy changes in Canada, which have yet to occur in the United States. Many kept their sexual orientation secret from health care providers, were afraid of what they might experience in long-term-care facilities, and felt that the larger system mainly focused on the needs of younger people.

Spirituality and Religion

Old gay and lesbian adults describe examples of falling away from religious groups because of organized religion's lack of understanding and acceptance of homosexuality. For many of them, being gay was equated with sin and immorality. Conservative religious groups link the AIDS crisis and the moral decay of society to the acceptance of gay and lesbian behavior.

As individuals age, spirituality and religion take on an increased sense of importance and comfort. Religious affiliation appears to have both a palliative and preventative effect on the health of the aged. Spiritually active people are better able to initiate and maintain intimate relationships, cope better with stress, and in general are healthier. Further, they have an increased capacity to survive illness and are more resilient overall in the face of life's challenges (Ramsey, 2001). Many gay congregations have formed (e.g., Dignity and Lutherans Concerned) and other congregations have welcomed gay and lesbian members.

Social Services

All older people worry about loneliness and isolation as they age. Although some gay or lesbian specialized services may be available, some older adults are too isolated or fearful to make use of them. Gay and lesbian older adults may be reluctant to participate in mainstream social service programs for fear that they will need to disclose their sexual orientation. On the other hand, some gay and lesbian older adults have created new "families" with friends who offer tremendous support as they age. One of the biggest fears of gay and lesbian adults as they age is that these fictive kin will not be recognized as decision makers when hospitalizations or serious illnesses occur.

One of the first agencies to serve an exclusively gay and lesbian aging client group was Senior Action in a Gay Environment (SAGE), which was started in New York in 1978 and now has more than 7,000 members as well as many affiliated agencies around the country. Many other gay and lesbian specialized social service programs have emerged recently. For example, the McArtor Center in Fort Lauderdale, Florida, is an adult day care center for gay and lesbian adults.

Policy and Legal Issues

Gay and lesbian relationships are not legally recognized. This one fact explains much of the inequities between long-term gay and lesbian relationships and long-term heterosexual relationships. When one member of a gay or lesbian relationship dies, the survivor is not eligible for survivor benefits or spousal benefits. If one member of the couple becomes disabled, the other partner would receive no disability benefits as would accrue to a spouse. Pension plans do not pay benefits to anyone but a legal spouse upon the death of a participant in the plan. Also, when one member of a gay or lesbian couple who has a 401(K) plan dies, the life partner is subject to a 20% federal withholding tax on the total amount, while a legal spouse pays no taxes on the inheritance. In some instances, gay or lesbian adults are reluctant to even list their partners as beneficiaries for insurance or pension benefits for fear of reprisal at their workplace.

Housing

Many gay and lesbian older adults live alone. Gay men are far more likely to live alone than their heterosexual counterparts. As with all adults, gays and lesbians want to live independently as long as possible. If housing and medical care is needed, gays and lesbians prefer a place to live where they can feel free to express their sexuality without fear of retaliation. Many assisted-living and independent-living facilities are now being designed specifically for gay and lesbian adults. GLBT (Gay, lesbian, bisexual, transgender) adults as a group are seen by developers as a growing consumer group with disposable income who may increasingly be interested in gay and lesbian housing that meets the full continuum of needs as one ages.

Conclusion

The world of gay and lesbian elders differs from that of their peers. In many areas of life, including both personal and in society, this population faces unique barriers and challenges. However, they have many of the same fears about growing old as all adults who are aging. They continue to show resilience, which results in improved conditions for themselves and younger cohorts of gay and lesbian adults. And yet, forces in society today seek to undo these improved conditions, which only reminds this older generation of their past experiences, possibly reinforcing a tendency among some to fear being open in their dealings with institutionalized systems. Service providers need to be cognizant of this unique dynamic.

JEAN K. QUAM
GARY S. WHITFORD

See also

Advance Directives
Human Immunodeficiency Virus (HIV) and AIDS

Internet Resources

American Society on Aging, Lesbian and Gay Aging Issues Network (LGAIN)
http://www.asaging.org.lgain.html

National Gay and Lesbian Task Force Policy Institute, Aging Initiative
www.nglt.org

Old Lesbians Organizing for Change (OLOC)
www.oloc.org

Senior Action in a Gay Environment (SAGE)
www.sageusa.org

REFERENCES

Brotman, S., Ryan, B., & Cormier, R. (2003). Health and social service needs of gay and lesbian elders and their families in Canada. *The Gerontologist*, *43*(2), 192–202.

Cahill, S., South, K., & Spade, J. (2000). *Outing age: Public policy issues affecting gay, lesbian, bisexual and transgender elders*. New York: The Policy Institute of the National Gay and Lesbian Task Force.

Quam, J. K., & Whitford, G. S. (1992). Adaptation and age-related expectations of older gay and lesbian adults. *The Gerontologist*, *32*(3), 367–374.

Ramsey, J. L. (2001). Spiritual intimacy in later life: Implications for clinical practice. *Generations*, *25*(3), 59–64.

GENETIC FACTORS IN ALZHEIMER'S DISEASE

Although Alzheimer's disease (AD) was characterized and named early in the 20th century, and the familial nature of the disease was documented more than 50 years ago (Sjogren, Sjogren, & Lindgren, 1952), only recently, in the era of molecular genetics, have we been able to identify specific genes that are responsible for the heritability of this devastating neurodegenerative disease. Thus, investigation of the disease at the molecular level and study of pathological cellular mechanisms that begin long before the clinical presentation of AD is now possible. The progress has been extremely important because the most effective therapeutic intervention will target the disease *process* rather than the disease *consequences*; the earlier such treatment can be introduced, the more effective it will be.

Early-Onset Alzheimer's Disease

In multiply-affected early-onset families (i.e., less than 60 years of age), the inheritance pattern is that of autosomal dominance, suggesting that single genes are responsible. Genetically predisposed family members will likely live long enough to exhibit AD, confirming transmission of the disease within the family. Early-onset AD families have enabled the discovery of three genes in which mutations can cause early-onset AD.

Key neuropathological hallmarks of AD are intracellular neurofibrillary tangles, comprising abnormally phosphorylated tau protein, and extracellular deposition of aggregates of the β-amyloid peptide (Aβ) in the brain, as noted by Alzheimer in 1907. Aβ is derived from enzymatic cleavage of the much larger transmembrane β-amyloid precursor protein (βAPP, encoded on chromosome 21) and typically ranges from 39 to 43 amino acids in length. It is unknown whether Aβ deposition or inadequate Aβ clearance cause the disease. The largest isoform of βAPP (βAPP$_{770}$) is 770 amino acids in length; the major βAPP isoforms exhibit two common processing pathways. The "nonamyloidogenic pathway" involves cleavage between amino acid codon 687 and 688 (the so-called α-secretase site) that precludes formation of Aβ. In the "amyloidogenic pathway," βAPP is cleaved at the β-secretase and γ-secretase sites at either end of Aβ. Cleavage of βAPP at the β and γ sites produces p3, which is the C-terminal fragment of Aβ. The amyloidogenic cleavage produced by β and γ secretases allows the Aβ to be released, polymerize with other Aβ peptides, and form oligomers, eventually resulting in the amyloid plaque. The central role for Aβ in AD was validated with the identification of early-onset AD mutations because all were ultimately shown to influence APP processing toward the amyloidogenic pathway.

In 1991, the first mutation was discovered at codon 717 of the βAPP gene, causing an amino-acid change of valine to isoleucine close to the C-terminal of the Aβ peptide (Goate et al., 1991; Online Mendelian Inheritance in Man [OMIM], p. 104760). Subsequently, two other mutations to the same amino acid were identified, changing the predicted valine to glycine (OMIM, p. 104760) or phenylalanine (OMIM, p. 104760). Thus, all three mutations occurred near to the γ -secretase cleavage site. In 1992, a novel double mutation causing early-onset AD was discovered in APP at codon 670/671 predicting changes of lysine to methionine, asparagine to leucine; the so-called Swedish mutation, because it was identified in a Swedish family (Mullan et al., 1992; OMIM, p. 104760). Given that the β-secretase cleavage site is between positions 671 and 672, this finding, together with the mutations at 717, suggested that the functional consequence of these mutations was altered cleavage by the secretases responsible for amyloidogenic cleavage of the APP protein.

Additional mutations (resulting in amino-acid changes at codons 713, 714, 715, or 716) segregate with early-onset AD. The effects of these mutations in cultured cells confirmed their role in altering cleavage of Aβ from the βAPP protein. Mutations at the C terminal of Aβ result in an increase in the ratio of longer to shorter length Aβ (increased $A\beta_{1-42}$:$A\beta_{1-40}$), whereas the mutation at codon 670/671 produces an approximately five-fold increase in total Aβ (OMIM, p. 104760). Thus, it appears that increased total Aβ or a relative increase in the amount of the longer Aβ is detrimental, because either of these conditions favors aggregation and deposition of Aβ. The γ -secretase cleavage is now considered to occur around codons 711 through 713 (creating Aβ40/42), whereas evidence for different C-terminal fragments of APP has led to the reporting of and ζ cleavage sites for APP at positions 720/721 and 717/718, respectively.

Additional mutations exist *within* the Aβ sequence that are associated with AD or amyloidogenic conditions. At codon 693, mutation from glutamate to glutamine causes hereditary cerebral hemorrhage with amyloidosis–Dutch type (HCHWA-D). The 693 mutation increases beta-sheet conformation of amyloid with a resulting increased propensity to aggregate. Similarly, other mutations at codon 693, the "Arctic" mutation (change to glycine), or "Italian" mutation (change to lysine), or an alanine to glycine substitution at codon 692 ("Flemish" mutation) cause presenile cerebral amyloid angiopathy, cerebral parenchymal amyloidosis, or both (Tanzi and Bertram, 2005).

The βAPP mutations did not account for all early-onset AD cases and genetic linkage studies in non-APP mutated early-onset families targeted chromosome 14 (OMIM, p. 104311). In 1995, the Presenilin-1 (PS1) gene was identified, and many mutations causing early-onset familial AD. More than 140 PS1 mutations have now been identified. Whereas the βAPP mutations predict an age of disease onset at approximately 55 years, the PS1 mutations typically cause an age of onset in the 40s, and unlike the βAPP mutations, they occur throughout the length of the protein. Through database searching, the homologous PS-2 gene on chromosome 1 was also identified (OMIM, pp. 104311 and 104300), within which 10 mutations have also been found to cause AD, although with a wider range of age of onset than either the βAPP or the PS-1 mutations. The PS mutations influence βAPP processing in a similar manner to the βAPP codon 717 mutations, and it is now known that Presenilin, along with the proteins nicastrin, PEN-2, and APH-1, comprise the γ-secretase complex responsible for proteolysis of APP and other protein substrates (Larner & Doran, 2006). To date, although polymorphisms exist in other components of the γ -secretase complex, PS is the only member to exhibit AD-causing mutations.

Mutations in βAPP or the PS proteins can be readily identified in the laboratory using a DNA sample extracted from blood or saliva. However, because these mutations are extremely rare and account for less than 1% of all Alzheimer's cases, it is meaningful to use this screen in families exhibiting early-onset AD. Such genetic testing was introduced in Europe shortly after the discovery of the first βAPP mutations, but other than in research settings, identifying those at risk is at the discretion of the individuals concerned and generates many ethical and disclosure considerations.

These mutations are "causative" as opposed to "risk factors," in that possession of one of these mutations virtually guarantees AD. Early-onset AD mutations all result in modified APP processing and Aβ production, so identifying these rare mutations highlights the central role of Aβ and βAPP processing in the disease and promotes research into the production and function of Aβ.

Risk Factors for Late-Onset Alzheimer's Disease

The only confirmed *risk* factor for late-onset AD remains the apolipoprotein E (apoE) gene on chromosome 19, which encodes a protein normally involved in cholesterol transport and neuronal repair. There are three common isoforms of APOE—$\epsilon 2$, $\epsilon 3$, and $\epsilon 4$—and the $\epsilon 4$ variant confers risk for AD, coronary artery disease, Parkinson's disease, severity of and recovery after head injury, and central nervous system ischemia (Mahley, Weisgraber, & Huang, 2006). The frequency of $\epsilon 4$ in the general population is around 15% but can be as high as 40% in an AD cohort (OMIM, pp. 104300 and 107741). Possession of one or two copies of $\epsilon 4$ does not *cause* AD but rather increases the risk for an earlier age of onset. APOE is a major risk factor for both genders in all ethnic groups, and epidemiological studies have shown that 55% of APOE $\epsilon 4$/ $\epsilon 4$ homozygotes develop AD by age 80, whereas only 27% of $\epsilon 3$/ $\epsilon 4$ heterozygotes and 9% of non-$\epsilon 4$ carriers develop AD by age 85. It has been suggested that the apoE protein in AD acts through altered repair mechanisms in the brain in response to damage (Mahley et al., 2006). From transgenic mouse studies, ApoE has also been suggested to be involved in plaque formation (perhaps through $A\beta$ clearance mechanisms).

Although mutations have been identified in the human tau gene, which encodes the primary protein of the neurofibrillary tangle (i.e., the other major neuropathological feature of Alzheimer's), these mutations do not cause AD but rather cause either frontotemporal dementia or progressive supranuclear palsy. Involvement of the tau gene in frontotemporal dementia includes abnormal deposition of neurofibrillary tangles in the frontotemporal regions of the brain, and tau mutations have been used in transgenic mouse studies to model tau pathology in mouse models of AD.

Despite innumerable AD genetic association studies, no other gene association has been universally replicated like APOE. Increased awareness of the role of the cerebrovasculature in AD has led to the investigation and confirmation of vascular risk factors for AD (i.e., hypertension, diabetes, atrial fibrillation) (Skoog, Kalaria, & Breteler, 1999). Consequently, genes encoding proteins with vascular involvement may also be associated with AD. Genetic linkage and association studies continue to highlight genes and regions of the genome wherein variation may contribute to risk for AD. In particular, evidence for linkage on chromosome 10 persists although the source continues to elude investigators. Interest persists in genes whose encoded protein relates to $A\beta$ production, action, or degradation.

Further Research on $A\beta$

Genetic research on Alzheimer's disease has advanced the field by identifying $A\beta$ as central to theβ disease process, and by creating both cell and animal laboratory models that identify the mechanisms of disease and, most important, therapeutic targets. Worldwide, pharmaceutical companies and research teams use cellular models to screen potential treatments and design more effective drugs. The normal function of $A\beta$ remains unknown, but cellular mechanisms that produce $A\beta$ and may trigger damaging effects present targets for therapeutic intervention. The cytotoxic effects of $A\beta$ are well reported. Researchers suggest that these occur through the disruption of calcium homeostasis or the balance of reactive oxygen species or through direct initiation of cell death/apoptosis. However, the ubiquitous expression of $A\beta$ and its evolutionary conservation suggest that it has a normal physiological role that, in response to a stimulus or its overproduction, becomes pathological. Physiological mechanisms for $A\beta$ have also been examined at the molecular level, revealing involvement in vasoactive, inflammatory, and immune response mechanisms that could, if disrupted, lead to cerebrovascular and neuronal damage.

In terms of $A\beta$ production, the secretase enzymes are major targets, because inhibition of β- and/or γ-secretase cleavage, or stimulation of α-secretase cleavage, should reduce $A\beta$ production and oppose the disease, although possible adverse effects of such inhibition must also be considered.

The early-onset genetic discoveries produced valid animal models of AD, and any promising *in vitro* results ultimately require confirmation *in vivo*. Animal models provide the opportunity to observe the disease at the cellular level at multiple stages, rather than just at the autopsy stage. It is important that potential therapeutic compounds can be tested for toxicity and efficacy.

Transgenic mouse models carrying mutations, or combinations of mutations that cause AD in humans, have developed aspects of the human disease with age, specifically amyloid deposits and cognitive dysfunction. The most commonly used models are the βAPP670/671 (Tg2576 or APPsw) model, which carries the "Swedish" mutation; the PDAPP mice, which carry the βAPP Valine-717-Phenylalanine mutation; and certain PS-1 mutations (e.g., Methionine-146-Leucine or Leucine-286-Valine). Another widely used model in AD research is the PSAPP double transgenic, which expresses both the Swedish mutation and a PS-1 mutation, resulting in accelerated amyloid deposition.

The first mouse model to develop neurofibrillary tangles was the JNPL3 line, which causes frontotemporal dementia. Doubly and triply transgenic mice, carrying tau mutations in conjunction with APPsw and PS-1 mutations, are now being used. Because the triple mice develop plaques at 6 months and subsequently develop tangles at 12 months, they provide a more complete model of AD neuropathology.

APOE transgenic mice have been created, and APOE knockout mice crossed with the PDAPP mouse develop no amyloid deposits in animals up to 22 months of age (OMIM, p. 104760), suggesting that APOE is required for Aβ deposition. It is interesting that expression of human APOE ϵ3 and ϵ4 isoforms in these crossed mice has been shown to reduce Aβ deposition, suggesting that these human APOE isoforms may decrease Aβ aggregation or increase Aβ clearance relative to an environment (OMIM, p. 107741).

The biggest risk factor for AD is aging, and even in the presence of one of the βAPP or PS mutation, 40 or more years elapse before there are any clinical signs of disease. One way to consider the genetic factors in AD may be that, once triggered, the βAPP and PS mutations actively assist the aging and degenerating processes (resulting in an earlier age of onset), as opposed to factors that more passively contribute risk by modifying susceptibility to damage (hence, a later age of onset) such as APOE. Identifying therapeutic targets and ways to test novel drugs ensures a more rapid course toward effective treatment. Genetic profiles of risk for disease and of response to pharmacotherapy will refine our ability to effectively treat Alzheimer's disease in the future.

SARAH WILSON
FIONA CRAWFORD

See also
Dementia: Overview

Internet Resources

Alzheimer's Research Forum
http://www.alzforum.org/

Online Mendelian Inheritance in Man (OMIM)
http://www3.ncbi.nlm.nih.gov/Omim/searchomim.html

REFERENCES

Goate, A., Chartier-Harlin, M. C., Mullan, M., Brown, J., Crawford, F., Fidani, L., et al. (1991). Segregation of a missense mutation in the amyloid precursor protein gene with familial Alzheimer's disease. *Nature*, *349*(6311), 704–706.

Larner, A. J., & Doran, M. (2006). Clinical phenotype heterogeneity of Alzheimer's disease associated with mutations of the presenilin-1 gene. *Journal of Neurology*, *253*, 139–158.

Mahley, R. W., Weisgraber, K. H., & Huang, Y. (2006). Apolipoprotein E4: A causative factor and therapeutic target in neuropathology, including Alzheimer's disease. *Proceedings of the National Academy of Sciences*, *103*(15), 5644–5651.

Mullan, M., Crawford, F., Axelman, K., Houlden, H., Lilius, L., Winblad, B., et al. (1992). A pathogenic mutation for probable Alzheimer's disease in the APP gene at the N-terminus of beta-amyloid. *Nature Genetics*, *1*(5), 345–347.

Sjogren, T., Sjogren, H., & Lindgren, A. (1952). Morbus Alzheimer and morbus Pick: A genetic, clinical and patho-anatomical study. *Acta Psychiatrica Neurologica Scandinavica*, *82*(suppl.), 1–152.

Skoog, I., Kalaria, R. N., & Breteler, M. M. (1999). Vascular factors and Alzheimer's disease. *Alzheimer's Disease & Associated Disorders*, *13*(Suppl. 3), S106–S114.

Tanzi, R. E., & Bertram, L. (2005). Twenty years of Alzheimer's disease amyloid hypothesis: A genetic perspective. *Cell*, *120*, 545–555.

GERIATRIC ASSESSMENT PROGRAMS

Over the past 3 decades several types of special geriatric care programs have been developed, centered on the performance of *comprehensive geriatric assessment* (CGA) and associated treatment and follow-up services. CGA is a multidimensional, interdisciplinary, diagnostic procedure intended to determine a frail elderly person's medical, psychosocial, and functional capabilities and problems with the objective of developing an overall plan for treatment and long-term follow-up. CGA includes many components of the standard medical diagnostic evaluation, but it goes well beyond the routine examination in its focus on the *frail elderly* individual, emphasis on functional status and quality of life, comprehensiveness, and use of standardized measurement instruments and interdisciplinary teams. The rationale underlying CGA is that frail older people, with their complex clinical presentations and needs, require a special approach to evaluation and care that is not ordinarily supplied by health care providers, and that, given this special approach, geriatric patients will have more accurate and complete diagnosis, receive more appropriate care, have better care outcomes, and ultimately cost less by avoiding unnecessary services.

CGA can be performed in a variety of locations and health care contexts. It is a basic part of care in hospital geriatric units and geriatric consultation teams; it exists in programs within community senior health centers, and it often occurs in primary care settings as a supplement to the standard medical evaluation. Particularly successful model programs perform CGA and follow-up in the home by nurses, health visitors, or individuals from an interdisciplinary home care team. CGA can best be viewed as a continuum, ranging from a limited screening assessment by primary care physicians or community health workers, focused on identifying an older person's functional problems and disabilities, to more thorough evaluation of these problems in specialized geriatric or rehabilitation centers by a geriatrician and/or interdisciplinary team tied to initiation of a therapeutic plan, which often includes long-term case management.

Historical Overview of Geriatric Assessment

The first published reports of programs of *geriatric assessment* came from the British geriatrician *Marjory Warren*, who initiated the concept during the 1930s while she was in charge of a large chronic disease hospital (called a workhouse infirmary). This hospital was filled with bedridden and largely neglected older patients who had not received proper medical diagnosis or rehabilitation and who were thought to be in need of lifelong institutionalization. Skilled nursing care kept the patients alive, but lack of diagnostic assessment and rehabilitation kept them disabled. Warren systematically evaluated these patients, initiated active mobilization and selective rehabilitation, and was able to get most of the patients out of bed and often discharged home. As a result of her experiences, Warren advocated that every older patient receive what we know today as CGA and an attempt at rehabilitation before being admitted to a long-term care hospital or a nursing home.

The concepts of CGA have evolved in different settings around the world. As geriatric care systems have been initiated in multiple locations, CGA concepts and specific programs have generally been assigned central roles, usually as focal points for entry into the geriatric systems. In the United States, programs incorporating CGA principles began to appear in the 1970s. The first major U.S. health care organization to adopt and adapt CGA in a major way was the Department of

Veterans Affairs (VA) health care system, which has in recent years served a disproportionately elderly group of patients—by the year 2001, 39% of the veteran population was over age 65 (versus 13% of the rest of the U.S. population). Anticipating this challenge, in the mid-1970s the VA developed an innovative network of special demonstration programs focused on aging—*Geriatric Research Education and Clinical Centers* (GRECCs)—whose role was to devise creative new clinical care models for the special needs of older veterans, as well as to encourage aging-focused research and education. Several of these GRECCs started inpatient CGA units, typically modeled after U.K. programs. As a result of positive program evaluations, CGA units were mandated system wide, and by 1994, 133 of the 172 VA medical centers had defined CGA programs, usually called *geriatric evaluation and management programs* (GEMs) (Wieland, Rubenstein, Hedrick, Reuben, & Buchner, 1994).

Elsewhere in the world, CGA concepts also have become increasingly a part of standard geriatric care. CGA has not remained restricted to specific geriatric assessment programs, and its concepts can be found in virtually every program providing geriatric care. For example, in many areas, at least a limited geriatric assessment is required by law prior to a person's admission into a rehabilitation program or a nursing home. A 1993 report indicated that 9.7% of hospitals responding to a U.S. national survey (N = 1,639) had a functioning GEM unit (Lavizzo-Mourey, Hillman, Diserens, & Schwartz, 1993). Many managed care organizations have introduced systems of screening older enrollees for geriatric care needs and providing CGA and case management services to high-risk patients. In addition, there are growing numbers of programs that provide limited CGA and case management in the home setting.

Comprehensive Geriatric Assessment Process

The basic components of CGA include evaluation of medical problems and relevant co-morbidity, functional status, psychological status, social support network and activities, economic needs, and environmental safety. Ideally, each component can be assessed by the most appropriate team member(s) and discussed at an interdisciplinary team conference. In more limited settings, CGA involves fewer specialized disciplines, sometimes the physician or nurse alone. This is much less desirable in terms of both expertise and workload efficiency, because a single person alone cannot ordinarily provide sufficient time or expertise to deal optimally with the complex needs of frail older persons.

The process of CGA begins with identifying the patient in need—most commonly, older persons who have experienced deteriorations in health status and level of functioning. This can take place in a screening context outside the usual health care system (e.g., screening and referral programs in senior centers) or in a case-finding context within a physician's practice or other medical care setting. Ordinarily, if health status has worsened but functional level is intact, an elderly person can receive adequate care in the usual primary care setting. However, patients who have new or progressive functional deficits or difficult-to-manage geriatric problems (e.g., incontinence, dementia, frequent falls) should ideally receive CGA in a geriatric care context, because geriatric practitioners are generally better prepared than primary care providers to deal with these kinds of complex problems.

Following review of medical information and performance of a focused physical examination, a typical CGA proceeds to review the major domains of functioning. These are ordinarily captured in measures of basic *activities of daily living* (ADLs) and *instrumental ADLs* (IADLs). These scales are used clinically to detect whether the patient has problems performing activities necessary for independent survival in the community. Basic ADLs include *self-care* activities such as eating, dressing, bathing, transferring, and toileting. Patients unable to perform these activities will generally need 12- to 24-hour support by caregivers at home or in an institutional setting. IADLs include heavier housework, going on errands, managing finances, and telephoning—activities required for the individual to remain fully independent in a house or apartment.

After assessment of function, the CGA gathers information about the patient's environment and social situation. For example, the strength of the patient's social network, presence of environmental challenges, the amount and type of caregiver support available, and the level of social activities in which the patient participates will influence the clinical approach taken in managing detected deficits. This information is often best obtained by an experienced nurse or social worker. Two other key items of the CGA are screening evaluations for cognitive impairment and depression.

Sometimes a member of the extended assessment team or an outside specialist will need to evaluate the patient prior to the final formulation. For example, a physical or occupational therapist may need to evaluate a complex patient with difficulty dressing, a condition that could be caused by a number of problems, including cognitive impairment, poor finger mobility, or dysfunction of the shoulders, back, or hips.

Once CGA detects and quantifies medical, psychosocial, and functional problems and disabilities, appropriate treatment and management strategies can be formulated. When a reversible cause is found, a specific treatment may eliminate or ameliorate the disability. When the disability is complex or irreversible, rehabilitative or symptom-relief approaches can often provide substantial relief or improvement in function. Often the involvement and support of community or hospital-based resources are needed to devise an optimal plan for care and long-term follow-up.

Several factors must be considered when deciding where a CGA should take place, including the patient's level of disability and cognition, acuity and complexity of illness, social support strength, and access to transportation. In general, more disabled and complex patients with poorer social supports and transportation access will be more likely to need inpatient CGA services. These patients will be more likely to require prolonged periods of treatment and rehabilitation and less likely to keep outpatient appointments and comply with recommendations. Hospital programs offer greater opportunities for intensive treatment and rehabilitation under the care of interdisciplinary teams. This can occur in designated inpatient geriatric-assessment or special care units or by a careful geriatric team consultation in a nongeriatric hospital service.

Most CGAs do not require the full range of technologic capacity nor the intensity of physician and nurse monitoring found in the acute inpatient setting. A specialized geriatric setting outside an acute hospital ward, such as a day hospital or subacute inpatient geriatric evaluation unit, will provide the easy availability of an interdisciplinary team with the time and expertise to provide needed services efficiently, an adequate level of monitoring, and beds for patients unable to sit or stand for prolonged periods. Inpatient and day hospital assessment programs have the advantage of intensity, speed, and ability to care for particularly frail or acutely ill patients.

Outpatient and *in-home assessment* programs are generally cheaper because the need for inpatient stays and institutional resources is avoided. Although non-hospital programs cannot provide the level of technological care possible in the hospital, most elderly persons who are not acutely ill or severely functionally dependent can obtain adequate CGA outside the hospital. Moreover, in-home CGA and management programs can offer the advantages of observational assessment of the home environment and how well the patient actually functions at home.

Effectiveness of Geriatric Assessment Programs

Substantial literature supports the effectiveness of CGA programs in a variety of settings. The early descriptive studies of CGA described such benefits as improved diagnostic accuracy, reduced discharges to nursing homes, increased functional status, and reduced medications. Yet without concurrent control patients, these studies could not distinguish the effects of the programs from the simple effects of improvement over time, nor was it clear how these apparent benefits—-most of which affected process of care—would relate to short- or long-term outcome benefits. Beginning in the 1980s, however, controlled studies began to be published that corroborated some of the earlier studies and documented important additional benefits, such as improved survival, reduced hospital and nursing home use, and in some cases reduced costs. However, these studies were by no means uniform in their results. Some showed a whole series of dramatic and interrelated benefits, whereas others showed few if any benefits (Rubenstein, Josephson, Wieland, English, Sayre, & Kane, 1984; Rubenstein, Stuck, Siu, & Wieland, 1991).

A careful meta-analysis of the controlled trials performed through 1993 provided strong confirmation that these programs can improve survival, decrease use of institutional services, and improve levels of both mental and physical functioning (Stuck, Siu, Wieland, Adams, & Rubenstein, 1993). Although not all studies showed equivalent effects, the meta-analysis was able to indicate a number of variables at both the program and patient levels that tended to distinguish trials with large effects from those with more limited ones. On the program level, hospital CGA units and home-visit assessment teams produced the most dramatic benefits, while benefits in office-based programs could not be confirmed. Programs that provided hands-on clinical care and/or long-term follow-up were generally able to produce greater positive effects than did purely consultative programs or ones that lacked follow-up. Among hospital-based programs, careful *patient targeting* (i.e. selecting patients who were at high risk for deterioration yet who still had “rehabilitation potential”) was also associated with larger benefit.

Studies continue to be published testing effectiveness of CGA models. In general, studies have found continuing benefit from CGA, although as care delivered to older persons has improved over time in usual care settings, the added benefit from specialized CGA programs has lessened somewhat. This is clearly a positive trend for eldercare as a whole, and ultimately usual care practice may improve to the point that the need for CGA is eliminated; however, this time is unfortunately still far in the future (Rubenstein, 2004). In the meantime, there is some evidence that even when functional outcomes are equivalent between CGA and usual care, patients and caregivers derive additional benefits (Rockwood, Stadnyk, Carver, MacPherson, Beanlands, Powell, et al., 2000).

We look to further research to define better the most effective and efficient methods for performing CGA, the best program models, and the individuals likely to derive the most benefit. In the meantime, considerable evidence supports the continued growth and expansion of these programs throughout the geriatric care system.

LAURENCE RUBENSTEIN

REFERENCES

Lavizzo-Mourey, R. J., Hillman, A. L., Diserens, D., & Schwartz, J. S. (1993). Hospitals’ motivations tin establishing or closing geriatric evaluation and management units. *Journal of Gerontology: Medical Sciences*, *48*, M78–M83.

Rockwood, K., Stadnyk, K., Carver, D., MacPherson, K. M., Beanlands, H. E., Powell, C., Stollee, P., Thoman, V. S., & Tonks, R. S. (2000). A clinimetric evaluation of specialized geriatric care for rural-dwelling, frail older people. *Journal of the American Geriatrics Society*, *48*, 1080–1085.

Rubenstein, L. Z., Josephson, K. R., Wieland, G. D., English, P. A., Sayre, J. A., & Kane, R. L. (1984). Effectiveness of a geriatric evaluation unit: A randomized clinical trial. *New England Journal of Medicine*, *311*, 1664–1670.

Rubenstein, L. Z., Stuck, A. E., Siu, A. L., & Wieland, G. D. (1991). Impacts of geriatric evaluation and management programs on defined outcomes: Overview of the evidence. *Journal of the American Geriatrics Society*, *39*(Suppl.), 8–16.

Rubenstein, L. Z. (2004). Comprehensive geriatric assessment: From miracle to reality. *Journal of Gerontology: Medical Sciences*, *59A*, 473–477.

Stuck, A. E., Siu, A. L., Wieland, G. D., Adams, J., & Rubenstein, L. Z. (1993). Comprehensive geriatric assessment: A meta-analysis of controlled trials. *Lancet*, *342*, 1032–1036.

Wieland, G. D., Rubenstein, L. Z., Hedrick, S. C., Reuben, D. B., & Buchner, D. M. (1994). Inpatient geriatric evaluation & management units (GEMs) in the VA system: Diamonds in the rough? *Journal of Gerontology: Medical Sciences*, *49*, M195–M200.

GERIATRIC CONSULTATION

The purpose of a geriatric consultation is to assess a patient from a medical, cognitive, psychological, social, environmental, and functional perspective and make recommendations to improve care. A core interdisciplinary team consisting of a gerontological nurse practitioner, social worker, and geriatrician usually performs the evaluation. The team may also include other professionals such as a physical therapist, occupational therapist, speech therapist, physiatrist, nutritionist, pharmacist, and geropsychiatrist.

Geriatric consultation can occur in both the outpatient and hospital setting. In the outpatient environment, a geriatric evaluation may occur during a house-call visit, at a geriatric assessment center, or geriatric outpatient clinic. Patients may be self-referred or referred by other health professionals (i.e., primary care provider, emergency-room physician, or social worker upon discharge from an acute hospitalization or skilled nursing facility). Social service or home health care agencies or concerned caregivers may also refer elders for consultation.

In the hospital setting, consultations may be initiated in several ways. There may be a general policy to evaluate all patients older than a certain age. A consultation may be requested by a nongeriatric primary service to assess a particular patient. All patients who receive their care at a geriatric clinic, house-call program, or nursing home may be routinely followed by the geriatric service once they are admitted to the hospital. Finally, specific patients most likely to benefit from a geriatric assessment may be targeted and evaluated.

In the outpatient setting, consultation is often sought for evaluation of dementia, polypharmacy, incontinence, and depression. Additionally, families often look for assistance with long-term-care planning when an elder exhibits a decline in activities of daily living (ADL) function or seek to establish subsequent primary care with a geriatrician. In the hospital, consultation requests may be for general medical management, discharge planning, “failure to thrive,” rehabilitation potential, assistance with ethical issues, preoperative screening, confusion, incontinence, gait instability, falls assessment, and social evaluation (Duthie & Gambert, 1984; Lichtenstein & Winograd, 1984). A consult team that provides liaison services aims to prevent delirium and iatrogenic complications and provides extra attention to medication orders, skin care, bowel regimen, removal of unnecessary tethers (i.e., urinary catheters and intravenous lines), and early physical mobilization.

Geriatric consultations are often comprehensive and can be time-consuming. It may require a long time to review a chart, obtain a history from and examine a patient who has hearing or visual impairments, communication and memory difficulties, contact family members or caregivers to gather additional information, and attempt to coordinate multidisciplinary care.

Despite the effort required to provide a geriatric assessment, the overall benefits of geriatric consultation services are controversial, in large part due to the heterogeneity of existing studies. Research results may differ by the setting in which the consultation services are provided (i.e., outpatient versus inpatient; Veterans Administration hospital versus academic teaching hospital versus community hospital), types of patients targeted (i.e., based on age only versus degree of functional impairment), and the structure of the geriatric consultation program itself. Studies to date show mixed results in mortality, function, hospital-acquired complication rates, rehospitalization rates, and cost savings (Becker, McVey, Saltz, Feussner, & Cohen, 1987; Campion, Jette, & Berkman, 1983; Ellis & Langhorne, 2005; Lichtenstein & Winograd, 1984; Rubinstein, Stuck, Siu, & Wieland, 1991).

Although long-term effects are unclear, geriatric consultation may result in better care for the patient. New treatable diagnoses such as sensory impairment, depression, dementia, adverse medication effects, delirium, dysphagia, cardiovascular disorders, malnutrition, anemia, pressure ulcers, constipation, and orthostatic hypotension may be identified (Duthie & Gambert, 1984; Lichtenstein & Winograd, 1984). Geriatric consultation may lead to alternate suggested therapies. For example, instead of a patient being prescribed a sedative for agitation, a companion could be suggested to provide reorientation and reassurance for a confused patient. Often, more referrals are made to psychiatry, physical therapy, occupational therapy services, and community service agencies (Campion, Jette, & Berkman, 1983; Lichtenstein & Winograd, 1984). This may result in preserved or improved function. Discharge planning may be enhanced; patients may be able to go home with home care services instead of transfer to a nursing home (Lichtenstein & Winograd, 1984). Geriatric consultation teams may also provide emotional support for patients, families, and staff and result in greater patient and caregiver satisfaction and improved staff attitudes (Becker et al., 1987; Campion, Jette, & Berkman, 1983).

For any consultation to be effective, the recommendations suggested by the consultant must be implemented. In general, several factors determine the likelihood that a consultant's suggestions will be implemented. The institution must have the resources necessary to carry out suggested recommendations (e.g., sufficient supply of bedside commodes to meet patient needs; or adequate nursing staff to help patients transfer from bed to chair; or a physical and occupational therapy program that is experienced with frail older patients). The likelihood of compliance is increased when a consultation involves a severely ill patient, suggests medication changes, or limits the number of recommendations to five or fewer (Sears & Charlson, 1983). In geriatric consultation, compliance is especially high when recommendations pertain to gait instability, falls, and discharge planning (Allen et al., 1986).

Unlike subspecialists who offer specific procedural skills, geriatrics consultants bring a global knowledge base that utilizes interdisciplinary expertise to coordinate care that is sensitive to the physiological, functional, cognitive, and social changes that occur with aging. Some health providers may misperceive the geriatric service as confined to discharge planning. There may be concerns that recommendations to perform additional diagnostic tests or consult additional specialties could lead to an increased length of stay for the patient. To address these misconceptions, geriatric consultation programs can strive to educate house staff about common geriatric syndromes through both formal and informal teaching endeavors. Because the geriatric consultation service has opportunities to follow patients on different specialty services (i.e., general surgery, psychiatry, neurology, orthopedics, and rehabilitation medicine), the team may have an educational impact on many nongeriatrics-oriented specialties. When other health professionals become more geriatric-sensitive, older patients will receive improved quality of care.

TARYN YEON SIL LEE

See also
Geriatric Evaluation and Management Units

Internet Resources
Helpguide
http://www.helpguide.org/elder/geriatric_assessment.htm

Massachusetts General Hospital
http://www.massgeneral.org/seniorhealthweb/seniorhealth_consult.htm

University of California San Diego School of Medicine
http://meded.ucsd.edu/cga/

U.S. Dept of Health and Human Services, Agency for Healthcare Research & Quality
http://www.ahrq.gov/CLINIC/PTSAFETY/chap29.htm

REFERENCES

Allen, C. M., Becker, P. M., McVey, L. J., Saltz, C., Feussner, J. R., & Cohen, H. J. (1986). A randomized, controlled clinical trial of a geriatric consultation team: compliance with recommendations. *Journal of the American Medical Association*, *255*(19), 2617–2621.

Becker, P. M., McVey, L. J., Saltz, C. C., Feussner, J. R., & Cohen, H. J. (1987). Hospital-acquired complications in a randomized controlled clinical trial of a geriatric consultation team. *Journal of the American Medical Association*, *257*(17), 2313–2317.

Campion, E. W., Jette, A., & Berkman, B. (1983). An interdisciplinary geriatric consultation service: A controlled trial. *Journal of the American Geriatrics Society*, *31*(12), 792–796.

Duthie, E. H., & Gambert, S. R. (1984). Geriatrics consultation: Implications for teaching and clinical care. *Gerontology and Geriatrics Education*, *4*(2), 59–66.

Ellis, G., & Langhorne, P. (2005). Comprehensive geriatric assessment for older hospital patients. *British Medical Bulletin*, *71*, 45–59.

Lichtenstein, H., & Winograd, C. H. (1984). Geriatric consultation: A functional approach. *Journal of the American Geriatrics Society*, *32*(5), 356–361.

Rubenstein, L. Z., Stuck, A. E., Siu, A. L., & Wieland, D. (1991). Impacts of geriatric evaluation and management programs on defined outcomes: Overview of the evidence. *Journal of the American Geriatrics Society*, 39S, 8S–16S.

Sears, C. L., & Charlson, M. E. (1983). The effectiveness of a consultation: Compliance with initial recommendations. *The American Journal of Medicine*, *74*(5), 870–876.

GERIATRIC DENTISTRY: CLINICAL ASPECTS

Overview

The head, neck, and oral structures undergo changes across a person's lifespan. Older adults are more susceptible to systemic conditions, predisposing them to develop oral and maxillofacial diseases that can directly or indirectly lead to malnutrition, altered communication, increased susceptibility to infectious diseases, and diminished quality of life (Ship, 2003). Interestingly, age alone does not seem to play a major role in impaired oral health. Rather, oral diseases (e.g., dental caries, gingivitis and periodontitis, oral mucosal diseases, salivary dysfunction, alveolar bone resorption), systemic conditions (e.g., diabetes, stroke, Alzheimer's disease), prescription and nonprescription medications, and head and neck radiotherapy predispose older persons to developing oral and pharyngeal (i.e., throat) disorders. The effects of these disorders are not limited to the oral cavity and its functions. Oral diseases give rise to pathogens, which can be blood-borne or aspirated into the lungs, bringing about severe, even life-threatening consequences. Systemic mucosal and skin diseases can manifest initially in the oral cavity, which can predispose older individuals to additional oral and pharyngeal problems.

Today's older adults are more likely to have natural teeth compared to previous aged cohorts (Ship, Allen, & Lynch, 2004). Thus, older persons are currently at higher risk of developing a serious dentally derived medical problem than earlier cohorts of elders. Older adults are also more likely to utilize dental health care services and perform regular oral hygiene compared to previous older generations. Therefore, it is imperative that health care professionals become familiar with the common aspects of oral diseases so that early diagnosis can lead to interventions with a high likelihood of preserving oral function (Ship, 2003). The goal is to develop universal oral-disease-prevention strategies that will help all older persons maintain a good oral health–related quality of life (Sarment & Antonucci, 2002).

Teeth

The most common age-related changes in teeth include wear (i.e., attrition), recession of the dental pulp, and decreased cellularity of tooth structures (Ship et al., 2004). With greater age, teeth undergo staining, chipping, and cracking and become more susceptible to fracture. Older people are at risk for developing new and recurrent coronal (i.e., chewing surfaces of teeth) caries, and they are more likely to have root-surface caries compared to younger adults. Dental caries, the most common cause of tooth loss in the elderly, account for more extractions than periodontal diseases. Gingival recession, salivary gland hypofunction (i.e., dry mouth), ineffective oral hygiene, removable prostheses (i.e., partial or full dentures), and diminished oral motor function all contribute to root-surface caries. Large restorations (i.e., fillings) place coronal surfaces at risk for decay as well.

Caries treatment in the elderly does not differ dramatically from that of younger patients. Fluoride-releasing restorative materials (i.e., glass ionomers) are particularly useful for root-surface decay and in patients with a dry mouth. Composite resins are indicated for repairing defective restorations and/or carious tooth surfaces, whereas the new generation of glass ionomer liners provides sustained fluoride release that reduces the incidence of recurrent caries.

An assessment of caries risk is advised for all patients; risk factors found in the geriatric population include use of medications that inhibit salivation, gingival recession, and poor oral hygiene secondary to debilitation. Dental caries and subsequent tooth loss can be prevented in high-risk patients with regular recall; application of topical fluoride rinses, gels, and varnishes; appropriate oral hygiene; and early intervention of dry mouth. Older patients with cognitive and/or motor disturbances (e.g., stroke, Parkinson's disease) usually require daily assistance to maintain the health of their dentition.

Periodontal Tissues

Although age-related changes in the periodontal tissues are not sufficient to lead to tooth loss, gingival recession and loss of periodontal attachment and bony support are almost universal in older persons (Holm-Pedersen, 1996). Because multiple oral factors, systemic diseases, and medications have an adverse influence on periodontal health, and these conditions are more prevalent among older adults, older individuals are at higher risk for experiencing periodontal disease-related morbidity. Diabetes, for example, leads to a higher prevalence and severity of periodontal diseases. Several medications frequently prescribed in older people have been associated with gingival enlargement (e.g., antihypertensive calcium channel blockers, the antiseizure drug phenytoin, and the immunosuppressant cyclosporine).

Periodontal diseases have oral and systemic effects on the health of older persons. They have been associated with halitosis (i.e., bad breath), gingivitis (i.e., inflamed and bleeding gum tissues), and tooth loss, which can affect mastication (i.e., chewing), swallowing, tasting, and nutritional intake. Periodontal diseases have also been associated with cardiovascular, cerebrovascular, endocrine, pulmonary, and infectious diseases.

The treatment of periodontal diseases is the same regardless of age and starts with prevention. Thorough toothbrushing and flossing are recommended for patients of all ages, preferably after each meal. Periodontal infections can be resolved with conservative surgical procedures, although wound-healing after soft-tissue procedures may take slightly longer in older patients. Patients with bleeding disorders, extensive heart and lung problems, and immunosuppression may be poor candidates for periodontal surgery; local methods (i.e., extensive cleanings including scaling/root planing), and antimicrobial and anti-inflammatory agents delivered topically or occasionally systemically are preferred.

Oral Mucosa

Both normal aging changes and pathological factors contribute to disorders of oral mucosal tissues. The mucosa that lines most of the oral cavity (i.e., stratified squamous epithelium) becomes thinner, loses elasticity, and atrophies with age (Pindborg & Holmstrup, 1996). Simultaneously, there are declines in immunological responsiveness that increase susceptibility to infection and trauma. Increases in the incidence of oral and systemic diseases and the use of multiple medications lead to oral mucosal disorders among the elderly. The oral mucosa is a common site for a large variety of lesions, ranging from benign and asymptomatic to malignant and potentially life-threatening. For example, many older adults are at risk for developing oral fungal infections, which, when diagnosed appropriately, usually resolve with topical therapies. Oral cancer, primarily a disease of adults aged 50 years and older, has only $\sim$50% survival at 5 years, due in part to late diagnosis (Neville & Day, 2002). Any mucosal lesion that persists for 3 to 4 weeks despite all attempts to remove suspected causes (e.g., ill-fitting denture flange) must be biopsied to determine a diagnosis. Regularly scheduled head, neck, and oral examinations are required to diagnose oral mucosal diseases at an early stage and to intervene with appropriate therapy. Even edentulous (i.e., missing all teeth) older adults require at least an annual head, neck, and oral examination to evaluate for benign and malignant lesions.

Salivary Glands

Although studies have demonstrated that in healthy older adults the volume of saliva does not decrease, many older persons complain of a dry mouth (i.e., xerostomia) and have diminished salivary output (i.e., salivary hypofunction). Medical diseases, medications, and radiation therapy for head and neck tumors are the most common causes (Ship, Pillemer, & Baum, 2002). More than 400 drugs have been reported to decrease salivary flow, especially tricyclic antidepressants, sedatives and tranquilizers, antihistamines, antihypertensives, cytotoxic agents, and anti−Parkinson drugs. Diseases such as Sjögren's syndrome, lupus, diabetes, and Alzheimer's can also cause dry mouth.

Insufficient salivary output leads to dry and friable oral mucosa; greater susceptibility to microbial infections (e.g., fungal or yeast infection); diminished lubrication; caries development; pain; difficulty with chewing, tasting, and swallowing; and impaired retention of removable prostheses. Early diagnosis and intervention are necessary to help preserve oral health in the adult with a dry mouth.

Effective collaboration with the patient's physicians can promote elimination of causative medications or help change to medications with fewer dry-mouth side effects. Salivary substitutes and oral moisturizers can assist in preventing complaints of dry mouth, and sugar-free candies and mints increase salivary output. Several drugs are available to increase saliva and should be considered for some patients. Teeth must be protected in the dry-mouth patient with daily exposure to high-dose fluorides, and periodontal health can be maintained with thorough toothbrushing and flossing.

Oral Motor and Sensory Function

Age-related changes in chewing, swallowing, and oral muscular posture can affect nutritional health and a person's quality of life (Palmer, 2005). The most often reported oral motor disturbance in older people is altered mastication and even though older persons with all of their natural teeth are less able to prepare food for swallowing as efficiently as younger adults, rarely do these changes have any adverse effects in a healthy older person. Alternatively, systemic diseases (e.g., strokes, Parkinson's disease) and certain drugs (e.g., phenothiazines) can cause significant and even permanent changes in chewing and swallowing, predisposing a person to choking or aspiration. Other age-related diseases such as osteoarthritis may affect the temporomandibular joint (TMJ), yet the elderly are less likely to report symptoms of TMJ-related pain.

Diminished food enjoyment, smell, and taste are common complaints in the elderly (Spielman & Ship, 2004). Although taste function is remarkably stable, olfaction (i.e., smell) is dramatically diminished with age. Decreased smell capacity combined with changes in oral motor, salivary, and other sensory modalities most likely account for the loss of flavor perception and interest in food in some older persons. An adult reporting these symptoms requires a comprehensive evaluation to determine the cause of the problem. Nutritional counseling will help prevent malnutrition, dehydration, and a diminished quality of life.

JONATHAN A. SHIP

See also
Dental Implants
Dentures
Oral Health Assessment
Xerostomia

Internet Resources

American Academy of Periodontology
http://www.perio.org/consumer/2m.htm

American Dental Association
http://www.ada.org/public/topics/implants.asp

International Association for Dental Research
http://www.iadr.com/start.html

National Institute of Dental and Craniofacial Research
http://www.nidcr.nih.gov/

Oral Health America
http://www.oralhealthamerica.org/home.html

REFERENCES

Holm-Pedersen, P. (1996). Pathology and treatment of periodontal diseases in the aging individual. In P. Holm-Pedersen & H. Loe (Eds.), *Textbook of geriatric dentistry* (2nd ed., pp. 388–405). Copenhagen: Munksgaard.

Neville, B. W., & Day, T. A. (2002). Oral cancer and precancerous lesions. *CA: Cancer Journal for Clinicians*, *52*(4), 195–215.

Palmer, C. A. (2005). Age-related changes in oral health status: Effects of diet and nutrition. In R. Touger-Decke, D. A. Sirois, & C. C. Mobley (Eds.), *Nutrition and oral medicine* (1st ed., pp. 31–43). Totawa, NJ: Humana Press.

Pindborg, J. J., & Holmstrup, P. (1996). Pathology and treatment of diseases in oral mucous membranes and salivary glands. In P. Holm-Pedersen & H. Loe (Eds.), *Textbook of geriatric dentistry* (2nd ed., pp. 405–428). Copenhagen: Munksgaard.

Sarment, D. P., & Antonucci, T. C. (2002). Oral health-related quality of life and older adults. In M. R. Inglehart & R. A. Bagramian (Eds.), *Oral health-related quality of life* (1st ed., pp. 99–110). Chicago: Quintessence Publishing Co., Inc.

Ship, J. A. (2003). Geriatrics. In M. S. Greenberg & M. Glick (Eds), *Burket's oral medicine diagnosis and treatment* (10th ed., pp. 605–622). Hamilton, Ontario: BC Decker.

Ship, J. A., Allen, K. L., & Lynch, E. (2004). Dental caries in the elderly. In E. Lynch (Ed.), *Ozone: The revolution in dentistry* (1st ed., pp. 295–300). Copenhagen: Quintessence Publishing Co., Inc.

Ship, J. A., Pillemer, S. R., & Baum, B. J. (2002). Xerostomia and the geriatric patient. *Journal of the American Geriatrics Society*, *50*(3), 535–543.

Spielman, A. I., & Ship, J. A. (2004). Taste and smell. In T. S. Miles, B. Nauntofte, & P. Svensson (Eds.), *Clinical oral physiology* (1st ed., pp. 53–70). Copenhagen: Quintessence Publishing Co., Ltd.

GERIATRIC EVALUATION AND MANAGEMENT UNITS

Geriatric evaluation and management (GEM) units are interdisciplinary systems of care designed to improve the outcomes and quality of life of older patients. The GEM unit couples comprehensive geriatric assessment with specific treatment plans, individualized to the patient's needs. Geriatricians work closely with a team of other health care professionals including, most often, advanced practice nurses (i.e., clinical nurse specialists or nurse practitioners), social workers, physical therapists, and the patient's attending physician to complete a medical evaluation and plan for patients. Using a systematic approach, the geriatrician and team consider the ("Geriatric") patient's present medical conditions, medical history, social supports, living conditions, and ability to perform activities of daily living (ADL). The geriatrician catalogues the patient's medical diagnoses, orders laboratory studies, and makes referrals to other specialists as warranted ("Evaluation"); and, in collaboration with the interdisciplinary team, generates a summary of interventions to conduct in order to optimize the patient's medical care and level of physical functioning ("Management").

Components of GEM Interventions

GEM units can be located in various settings, including hospitals, rehabilitation units, nursing homes, and outpatient clinics. Some hospital-based GEM units focus on a specific diagnosis, such as stroke. In hospital-based GEM units, patients are either directly admitted or transferred to the unit after acute-care hospitalization. The interdisciplinary care team evaluates the patient. The assessment process is linked to interventions designed to improve diagnostic accuracy and the patient's functional status and mobility and to inform discharge planning. Patients are usually screened for common geriatric syndromes such as falls, incontinence, sensory impairments, and mobility impairments.

The specific components of GEM interventions differ somewhat, depending on the setting and the goal of the GEM unit. However, there are many similarities across units. Most GEM protocols begin with a specific targeting strategy directed at identifying patients who are most likely to benefit from a comprehensive assessment. The general goal is to identify patients at high risk for adverse outcomes such as functional deterioration and nursing-home placement, while at the same time conserving health care resources by not targeting patients who are so ill or dependent that they are unlikely to benefit. Comprehensive evaluations usually include an assessment of caregiving needs and caregiver stress. Examples of high-risk patients targeted by GEM units include those who are dependent in one or more basic or instrumental activities of daily living (IADL), those with cognitive impairment or depressive symptoms, those recently hospitalized, and those who live alone or with a stressed caregiver.

The results of the evaluation are reviewed in a team conference, often with the patient or family in attendance, where team members make specific preventive and restorative recommendations. For example, a patient found to be at high risk of falling after screening may be referred for physical therapy or may receive a change in psychotropic medication. The caregiver of a patient with dementia may be referred to a support group or for training in the management of problem behaviors.

Hospital-Based GEM Units/Veterans Administration GEM Units

The initial GEM units were developed and evaluated in the Veteran's Administration (VA) hospitals (Rubenstein, Josephson, Wieland, English, & Sayre, 1984), and are now most often included in the VA Geriatric Research, Education, and Clinical Centers (GRECC). Patients may be admitted for only a few days or even 1 to 2 months to complete the process of evaluation and management. The goal of the VA GEM unit is to improve the process and outcome of clinical care by the following objectives:

- improving diagnostic accuracy
- optimizing drug prescribing
- assuring the most appropriate discharge location (i.e., most independent and least restrictive level of care)
- minimizing repeated hospitalizations
- maximizing physical and psychosocial functional status
- reducing inappropriate use of resources (i.e., acute hospital, nursing home, and community)
- providing interdisciplinary patient evaluations
- establishing and coordinating an interdisciplinary plan for long-term management of care
- developing clinical indicators and monitoring the quality of care provided

The first controlled trial of the VA GEM unit demonstrated positive effects on important patient outcomes. Reduced mortality, fewer acute-care hospital days, improved functional status, and better morale were reported among patients assigned to the GEM unit compared to control patients who received usual care (Rubenstein et al., 1984). Subsequent controlled clinical trials have shown important, if less impressive, findings. In a multicenter study of inpatient GEM with subsequent outpatient follow-up, functional decline was reduced during the inpatient GEM admission, and mental health was improved among veterans receiving outpatient GEM (Cohen et al., 2002). Nursing-home admissions were less common among patients on the GEM unit (Phibbs et al., 2006). Quality-of-life measures were significantly better for cancer patients admitted to the unit compared to usual care (Rao, Hsieh, Feussner, & Cohen, 2005).

Community-Hospital–Based GEM Units

Community-hospital GEM units are typically separate hospital wards that have been redesigned to facilitate care of the geriatric patient. Multidisciplinary team rounds and patient-centered team conferences are hallmarks of care on these units, which, in contrast to geriatric consultation services, have direct control over the implementation of team recommendations. GEM units have been proliferating in community hospitals but without the rigorous level of investigation seen with the VA studies. Variations on the traditional GEM unit model have been developed and are effective in improving clinical outcomes. Among these variations is the Acute Care for Elders (ACE) Unit and the Hospital Elder Life Program (HELP). Unlike most inpatient GEM units, the ACE and HELP models of care are based on acute-care units where the short length of stay and high acuity of illness predispose patients to functional decline and loss of mobility. These models of care are designed to prevent loss of functional independence and delirium through improved processes of medical care. The geriatric assessment is brief and targeted at risk factors for decline or delirium, and management focuses on the acute-care issues. The management of chronic diseases occurs following transition of care from hospital to home or other site.

Outpatient-Based GEM Units

Similar to inpatient units, outpatient GEM units evaluate a frail older adult's medical, psychosocial, and functional capabilities and limitations and is followed by comprehensive, interdisciplinary, ongoing care that is tailored to the patient's individual needs. Recommendations are typically shared with the patient's primary care physician and the patient in a summary report. The execution of these recommendations varies considerably among outpatient GEM units. In some GEM units, the GEM team assumes overall responsibility for the patient for a finite length of time. The effectiveness of this approach was shown in a population-based sample of community-dwelling Medicare beneficiaries who were at high risk for hospital admission in the future. The GEM intervention included a comprehensive assessment followed by primary care by the team for up to 6 months. Patients receiving the intervention compared to usual care patients were significantly less likely to lose functional ability, to experience increased health-related restrictions in their ADLs, to have possible depression, or to use home health care services (Boult et al., 2001). Other GEM units play a purely consultative role and make recommendations to a primary caregiver, or strive to improve primary care physician and patient adherence with recommendations following an interdisciplinary assessment. In one study (Reuben, Frank, Hirsch, McGuigan, & Maly, 1999), the intervention focusing on adherence to recommendations prevented decline in functional and health-related quality of life among community-dwelling older persons who had the specific geriatric conditions of falls, incontinence, depressive symptoms, and functional impairment.

In summary, both inpatient and outpatient GEM units have been effective in improving the functional status of elderly patients at risk for functional decline or hospitalization. Although the earliest studies demonstrated dramatic benefits on these outcomes, recent studies show more modest effects. The process of a geriatric assessment is laborious, depends on the collaboration of an interdisciplinary care team of health professionals, and is not reimbursed under fee-for-service Medicare. Nonetheless, the health benefits of GEM are substantial for both the patients and their caregivers.

ROBERT M. PALMER

See also

Gait Assessment Instruments
Geriatric Interdisciplinary Team Training
Geriatric Resource Nurse
Hospital-Based Services
Nurses Improving Care to Health System Elders (NICHE)

Internet Resources:

The American Geriatrics Society's statement on comprehensive geriatric assessment
http://www.americangeriatrics.org/products/positionpapers/cga.shtml

AHCPR review of geriatric evaluation and management units for hospitalized patients
http://www.ahcpr.gov/CLINIC/PTSAFETY/chap30.htm

Goals and objectives of GEM programs in the VA
http://www1.va.gov/GeriatricsSHG/page.cfm?pg=69

REFERENCES

Boult, C., Boult, L. B., Morishita, L., Dowd, B., Kane, R. L., & Urdangarin, C. F. (2001). A randomized clinical trial of outpatient geriatric evaluation and management. *Journal of the American Geriatrics Society*, *49*, 351–359.

Cohen, H. J., Feussner, J. R., Weinberger, M., Hamdy, R. C., Hsieh, F., Phibbs, C., et al. (2002). A controlled trial of inpatient and outpatient geriatric evaluation and management. *New England Journal of Medicine*, *346*, 905–912.

Phibbs, C. S., Holty, J. E., Goldstein, M. K., Garber, A. M., Wang, Y., & Cohen, H. J. (2006). The effect of geriatrics evaluation and management on nursing home use and health care costs: Results from a randomized trial. *Medical Care*, *44*, 91–95.

Rao, A. V., Hsieh, F., Feussner, J. R., & Cohen, H. J. (2005). Geriatric evaluation and management units in the care of the frail elderly cancer patient. *Journals of Gerontology*, *60A*, M798–M803.

Reuben, D. B., Frank, J. C., Hirsch, S. H., McGuigan, K. A., & Maly, R. C. (1999). A randomized clinical trial of outpatient comprehensive geriatric assessment coupled with an intervention to increase adherence to recommendations. *Journal of the American Geriatrics Society*, 47, 269–276.

Rubenstein, L. W., Josephson, K. R., Wieland, G. D., English, P. A., Sayre, J. A., & Kane, R. L. (1984). Effectiveness of a geriatric evaluation unit: A randomized clinical trial. *New England Journal of Medicine*, *311*, 1664–1670.

GERIATRIC INTERDISCIPLINARY TEAM TRAINING (GITT)

Older people often have multiple illnesses and conditions, sometimes with cognitive loss, which may result in increased loss of function and isolation. Frequently, each medical condition requires a specific treatment or medication regimen that is difficult to adhere to—remembering to take it at the right time and in the appropriate way. Additionally, prescriptions and over-the-counter (OTC) medications may interact, causing negative side effects. Thus, older patients with a number of chronic or acute conditions benefit when they receive coordinated care from several disciplines working together. However, these professionals must be able to work together effectively, create an integrated plan, and coordinate the patient's care on an ongoing basis. When multiple health care practitioners administer uncoordinated care, services can be at odds with one another, and patients often suffer. The "layering" of recommendations, orders, and medications, one on another, is *multidisciplinary* care. This is in sharp contrast to *interdisciplinary* care—that is, coordinated care developed by skilled clinicians who jointly agree on a care plan and work together to implement that plan.

Not all older patients require the care of an interdisciplinary team, and even patients who benefit from teams do not require a team review at every visit. The needs of the patient should drive the number and type of providers delivering care. Generally, patients with complex physical, emotional, social, and economic issues need, at a minimum, medical, nursing, social work, and pharmacy services to develop or alter a care plan. Other practitioners, such as psychology, chaplaincy, and nutrition, are often part of the team as well. Studies of the clinical and cost-effectiveness of teams generally demonstrate that patients are helped by an initial comprehensive geriatric assessment conducted by multiple disciplines (Geriatrics Interdisciplinary Advisory Group, 2006). A recent study of the 26 Program of All-Inclusive Care for the Elderly (PACE) teams found that team performance was significantly associated with better functional outcomes for patients (Mukamel et al., 2006).

Transitions between levels of care are particularly important points where patients can benefit from interdisciplinary care. Frequently cited benefits of teams include a patient-centered focus that engages the patient as a partner in care and improved communication among providers, resulting in better patient outcomes. Among the successful collaborative-practice models were nurses and physicians working together to monitor patients at home who had chronic and unstable medical conditions such as congestive heart failure, hypertension, or diabetes.

In 1995, the John A. Hartford Foundation created a $12 million geriatric interdisciplinary team training (GITT) program to encourage the development of team training models for advanced practice nurses, medical residents, and master's-level social workers. The GITT program was established in response to three national trends pointing to the need for enhanced care for older patients: (1) the rapid growth of the older population with complex conditions requiring the skills of several disciplines; (2) the shift of services from inpatient to ambulatory and community-based care; and (3) the growth in managed care financing, calling for health care professionals to become more efficient in delivering care (Siegler, Hyer, Fulmer, & Mezey, 1998). An evaluation of the program revealed that trainees improved their attitudes toward health care teams and their perceived ability to function on teams (Fulmer et al., 2005).

Teams, as opposed to independent practitioners, are distinguished by agreement to work together and coordinate care. The focus on the patient requires that team members reach consensus on the goals of care, the priorities of treatment, and the ongoing measurement of the plan's outcomes. Sometimes a full and heated discussion of the patient's needs is required to recognize the trade-offs inherent in the plan of care. Effective health care teamwork requires agreement, and agreement requires keen interpersonal skills so that all members freely contribute to and feel accountable for the plan. Other characteristics of effective teams include a clear division of labor, training for members, and an administrative system that supports coordinated care and creates synergy among providers (e.g., electronic clinical records that can be accessed by all team members such as found in the VA system).

Stages of Team Development

Becoming a team requires work. Teams generally move through five stages of development that can vary in duration from days to weeks; these stages are fluid and teams frequently move from stage to stage. These phases, conceptualized by Drinka and Clark (2000), are as follows.

Stage 1—Forming

During this period, members are tentative and want to learn about one another and the reasons they became members of the team. Effective tasks in this stage include icebreakers to help members get to know one another and discussions about the purpose and goals of the health care team.

Stage 2—Norming

Team ground rules are agreed upon, and members now have a sense of cohesion and membership. Members know what to expect at meetings and share responsibility for the team process.

Stage 3—Confronting

This is considered the "difficult" stage by many, but in fact it can be a productive stage in that it brings issues and conflicts to the fore. This is the phase when members develop and implement criteria for decision-making, leadership, and protocols for the team processes, often through exchanges that are confrontational and challenging. However, conflict, particularly in an environment that is somewhat safe, can lead to a fine-tuning of the team goals and process because the underpinning assumptions are hammered out.

Stage 4—Performing

The roles, process, and structure are so well honed in this phase that the team is "humming along" – it is truly a team, more than the sum of its members. Although the group does need to monitor its progress to avoid "group think," the close working relationship and excellent communication among members allow the team to provide well-coordinated care for patients.

Stage 5—Leaving

This is an intermittent stage that reflects unavoidable turnover on the team. Leaving can involve one or many members–for instance, when a team downsizes because of organizational cutbacks. How the team reacts to the departure of one or more members will vary but will inevitably result in team readjustment.

Meeting Ground Rules

The team must establish its own rules or norms. Examples include attendance policy, promptness, types of permitted interruptions (e.g., patient emergencies only), confidentiality, protocol for patient presentations, breaks, pre-meeting preparation and completion of work between meetings, and rules on side conversations and digressions from the topic. Agreement about such standards usually prevents misunderstandings and improves team members' behavior.

Teaching Team Skills

The GITT program reinforces the importance of having students participate on well-functioning teams. Interdisciplinary teams allow students to witness professionals working together to solve patient problems, share expertise, create a plan of care, and resolve conflicts. Students see the rigor involved in productive meetings and can observe the interpersonal dynamics of teams. The teaching of team skills should focus on the attitudes, knowledge, and skills team members must learn (Mellor, Hyer, & Howe, 2002).

Attitudes

How much respect is there for the roles of all health professionals in the care of older adults and their families or caregivers? Are members willing to collaborate with all health care professionals? Is there an appreciation for the interdisciplinary team approach, especially for patients with functional and psychosocial disabilities? Studies have shown that we need to continue work in this area because trainees in some disciplines, such as medicine, are less inclined to embrace teamwork (Leipzig et al., 2002).

Knowledge

Team members need to learn about the skills, education, and training of their teammates. In GITT programs, trainees shadow members from other disciplines or interview team members about education and license requirements. Team members also benefit from learning about formal and informal community support services and how to access services such as home health care, hospice, mental health services, care management, telephone reassurance, visitors, companions, homemakers, chore services, meal programs, transportation services, senior centers, adult day care, respite care, and local area agencies on aging.

Skills

Effective teams improve patient care and meet the patient's needs. By identifying the myriad problems and issues involved in elder care, the team is better able to prioritize concerns and galvanize treatments and services. Focusing on the patient and family is a key skill. Other communication skills that are important include active listening, succinct presentations, summary of discussions, testing for agreements, focused questions and probes to clarify issues, and willingness to sacrifice autonomy to group consensus.

Effective and patient-centered teamwork is not happenstance. It involves patience, commitment, and flexibility. We as practitioners and educators should make every effort to pass on our teamwork knowledge, attitudes, and skills through active engagement of new team members and trainees.

JUDITH L. HOWE
KATHRYN HYER

Internet Resource

Geriatric Interdisciplinary Team Training Program
www.gitt.org

REFERENCES

Drinka, T. J. K., & Clark, P. G. (2000). *Health care teamwork*. Westport, CT: Auburn House.

Fulmer, T., Hyer, K., Flaherty, E., Mezey, M., Whitelaw, N., Jacobs, M. O., et al. (2005). Geriatric interdisciplinary team training program: Evaluation results. *Journal of Aging and Health*, *17*, 1–28.

Fulmer, T., Hyer, K., Flaherty, E., Mezey, M., Whitelaw, N., Jacobs, M. O., et al. (2005). Geriatric interdisciplinary team training program: Evaluation results. *Journal of Aging and Health*, *17*(4), 443–470.

Geriatrics Interdisciplinary Advisory Group (2006). Interdisciplinary care for older adults with complex needs: American Geriatrics Society Position Statement. *Journal of the American Geriatrics Society*, *54* (5), 849–852.

Leipzig, R. M., Hyer, K., Ek, K., Wallenstein, S., Vezina, M. L., Fairchild, S., et al. (2002). Attitudes toward working on interdisciplinary healthcare teams: A comparison by discipline. *Journal of the American Geriatrics Society*, *50*(6), 1141–1148.

Mellor, M. J., Hyer, K., & Howe, J. L. (2002). The geriatric interdisciplinary team approach: Challenges and opportunities in educating trainees together from a variety of disciplines. *Educational Gerontology*, *28*(10), 867–880.

Mukamel, D. B., Temkin-Greener, H., Delavan, R., Peterson, D. R., Gross, D., Kunitz, S., et al. (2006). Team performance and risk-adjusted health outcomes in the Program of All-Inclusive Care for the Elderly (PACE). *The Gerontologist*, *46*(2), 227–237.

Siegler, E. L., Hyer, K., Fulmer, T., & Mezey, M. (Eds.) (1998). *Geriatric interdisciplinary team training*. New York: Springer.

GERIATRIC RESOURCE NURSE

The Geriatric Resource Nurse (GRN) model is an educational and clinical intervention model that prepares staff nurses to be clinical resources on geriatric issues to other nurses on their unit (Mezey et al., 2004). The GRN model provides staff nurses, via education and modeling by a geriatric advanced practice nurse, with specific content for improved knowledge of care management for geriatric syndromes (e.g., falls, incontinence). GRNs identify and address specific geriatric syndromes such as falls and confusion and implement care strategies that discourage the use of restrictive devices and promote patient mobility.

Dr. Terry Fulmer initiated the Geriatric Resource Nurse (GRN) model in 1981 at Boston's Beth Israel Hospital. The unit-based GRN nurses, educated and mentored by an advanced practice nurse, provided consultation to other staff nurses regarding specific geriatric clinical syndromes. Anecdotal staff feedback indicated that this was a very successful approach to improving care of the elderly by creating standard protocols for common geriatric problems and enhancing the expertise of staff nurses (Fulmer, 2001).

As part of the Hartford Foundation's Hospital Outcomes Program for the Elderly multisite initiative, Dr. Fulmer and colleagues adapted the GRN model within a geriatrician-led care team at Yale New Haven Hospital. A randomized controlled trial using matched units found that this model was successful in improving management of delirium, immobility, bladder/bowel problems, and pressure-ulcer treatment and prevention (Inouye et al., 1993). Building on the knowledge gained from the Yale New Haven Hospital efforts, the John A. Hartford Foundation funded the Nurses Improving Care for the Health System Elderly (NICHE) Program in 1994. Under the direction of Drs. Fulmer and Mezey, the grant provided funds to develop the NICHE Program that included the GRN model as one of several approaches to improving care of hospitalized elders (Fulmer & Mezey, 1994). The NICHE Program has been implemented in more than 160 hospitals throughout the United States with 63% of these hospitals using the GRN model. Outcome studies from individual NICHE hospitals suggest that the GRN model results in positive outcomes for older patients, including reduced use of physical restraints and improvements in functional mobility (Lee & Fletcher, 2002; Lopez et al., 2002; Swauger & Tomlin, 2002; Turner, Lee, Fletcher, Hudson, & Barton, 2001).

The Geriatric Institutional Assessment Profile (GIAP) is an instrument designed to help NICHE-participating hospitals examine self-reported measures of nurses' improved knowledge and attitudes about care of the hospitalized elderly and perceived institutional support. Using pre- and post-test design, four NICHE sites employing the GRN model found a statistically significant improvement in nurses' perceptions of caring for the acutely ill older adult following implementation of the NICHE/GRN model (Fulmer et al., 2002). Further, nurses perceived less difficulty in caring for older patient and increased satisfaction with geriatric care. Nurses' knowledge about restraints, incontinence management, and pressure ulcers improved significantly. Finally, perceived obstacles to introducing best practice in care of hospitalized older adults decreased significantly (Fulmer et al., 2002). A study surveying 85 NICHE hospitals with 63% employing the GRN model reported that NICHE is a useful system-wide strategy to maximize the education of nurses that promotes the delivery of quality care to hospitalized older adults (Mezey et al., 2004).

Elizabeth A. Capezuti
Marie Boltz
Terry T. Fulmer

See also

Advanced Practice Nursing
Geriatric Resource Nurse
Hospital-Based Services

Internet Resources

John A. Hartford Foundation Institute for Geriatric Nursing
www.hartfordign.org

NICHE
www.hartfordign.org/programs/niche

Nurse Competence in Aging
www.geronurseonline.org

REFERENCES

Fulmer, T. (2001). The geriatric resource nurse: A model of caring for older patients. *American Journal of Nursing*, *102*, 62.

Fulmer, T., & Mezey, M. (1994). Nurses improving care to the hospitalized elderly. *Geriatric Nursing*, *15*(3), 126.

Fulmer, T., Mezey, M., Bottrell, M., Abraham, I., Sazant, J., Grossman, C., et al. (2002). Nurses Improving Care for Healthsystem Elders (NICHE): Nursing outcomes and benchmarks for evidence-based practice. *Geriatric Nursing*, *23*(3), 121–127.

Inouye, S. K., Acampora, D., Miller, R. L.., Fulmer, T., Hurst, L. D., & Cooney, L. M. (1993). The Yale Geriatric Care Program: A model of care to prevent functional decline in hospitalized elderly patients. *Journal of the American Geriatrics Society*, *41*(12), 1345–1352.

Lee, V. K., & Fletcher, K. R. (2002). Sustaining the geriatric resource nurse model at the University of Virginia. *Geriatric Nursing*, *23*(3), 128–132.

Lopez, M., Delmore, B., Ake, J. M., Kim, Y. R., Golden, P., Bier, J., et al. (2002). Implementing a geriatric resource nurse model. *Journal of Nursing Administration*, *32*(11), 577–585.

Mezey, M., Kobayashi, M., Grossman, S., Firpo, A., Fulmer, T., & Mitty, E. (2004). Nurses Improving Care to Health System Elders: (NICHE): Implementation of Best Practice Models. *Journal of Nursing Administration*, *34*(10), 451–457.

Swauger, K., & Tomlin, C. (2002). Best care for the elderly at Forsyth Medical Center. *Geriatric Nursing*, *23*(3), 145–150.

Turner, J. T., Lee, V., Fletcher, K., Hudson, K., & Barton, D. (2001). Measuring quality of care with an inpatient elderly population: The geriatric resource nurse model. *Journal of Gerontological Nursing*, *27*(3), 8–18.

GERIATRICIAN

A geriatrician is a physician with expertise in the care of older adults. Unlike gerontologists, who study the science of aging, geriatricians are allopathic or osteopathic physicians whose clinical focus on the elderly parallels that of their colleagues working at the other end of the lifespan, pediatricians. After graduating medical school, a physician must first complete 3 years of residency in family practice or internal medicine followed by at least 1 year of accredited geriatrics fellowship training to be eligible to take the examination for certification in the subspecialty of Geriatric Medicine (until July 2006, eligible candidates received a Certificate of Added Qualifications).

Although George Day and J. M. Charcot wrote medical texts in the 19th century about the diseases of late life (Chase, Mitchell, & Morley, 2000), Ignatz Nascher coined the term *geriatrics* in the early 1900s, noting the parallel with pediatrics (Nascher, 1909). As Nascher is often considered the "father" of geriatrics, Marjorie Warren is viewed as its "mother"; she created the first geriatrics unit, calling attention to the role of the environment and the importance of rehabilitation (Warren, 1946).

Most older individuals do not receive primary care from geriatricians, and many physicians fail to appreciate what geriatricians have to offer. Expertise in geriatric problems (e.g., polypharmacy, confusion, incontinence, gait disorders) and in a broad range of functional, medical, and psychosocial domains of elder care distinguishes geriatricians from their colleagues. Geriatrics requires specially honed team skills as well because comprehensive care of elders necessitates collaboration with experts in fields other than medicine.

Despite the proliferation of geriatric medicine fellowship programs, which increased from 92 in 1991–1992 to 131 in 2004–2005 (Warshaw & Bragg, 2006), and the "demographic imperative," the number of practicing geriatricians is not increasing. The Association of Directors of Geriatric Academic Programs (ADGAP) estimates that there were 6,774 active certified geriatricians in 2004, a 27% decline from 1998 (Warshaw and Bragg, 2006, Table 1.4). Relatively low pay compared to subspecialty colleagues (in large part due its lack of highly remunerative procedures and its dependence on Medicare reimbursement) limits the number of candidates who enter and remain in the field; burnout may also contribute. Nonetheless, a recent cross-specialty survey found that geriatricians were most likely to be highly satisfied with their careers (Leigh, Kravitz, Schembri, Samuels, & Mobley, 2002).

In addition to the anticipated manpower shortage, academic geriatrics is confronting a number of philosophical issues. Geriatricians in academic settings often shoulder significant teaching and patient care responsibilities, limiting time for publication and other academic pursuits. Geriatricians also continue to debate whether their field is specialty or primary care. Most academic centers have geriatrics divisions, and this confers a specialty status. Fundamentally, though, by virtue of its global approach to the patient and caregivers, geriatrics is a primary care field. What makes geriatrics so dynamic (and so satisfying) is the career flexibility offered by this duality. A geriatrician can provide primary care in any number of settings, be a medical director of a nursing home, offer inpatient consultation, serve as a hospitalist on an inpatient ACE unit, or any combination of these.

Because of the anticipated demographic changes, geriatricians must be determined proselytizers and recruiters. Geriatricians thrive on the challenges of managing patients with complex medical and psychosocial needs, and team support adds to the sense of satisfaction. Conveying that satisfaction and challenge to trainees is one of our responsibilities. Adding new geriatricians to the ranks is ideal, but we can also teach medical students and house staff destined for subspecialty careers to enjoy caring for older patients (Siegler & Capello, 2005).

EUGENIA L. SIEGLER

Internet Resources

American Geriatrics Society
http://www.americangeriatrics.org/

British Geriatrics Society
http://www.bgs.org.uk/index.htm

The AGS Foundation for Health in Aging (FHA)
http://www.healthinaging.org/

Canadian Geriatrics Society
http://www.canadiangeriatrics.com/

REFERENCES

American Geriatrics Society and Association of Directors of Geriatric Academic Programs (2006). Geriatric medicine: A clinical imperative for an aging population. Available at http://www.americangeriatrics.org/WrittenReport.pdf

Chase, P., Mitchell, K., & Morley, J. E. (2000). In the steps of giants: The early geriatrics texts. *Journal of the American Geriatrics Society*, *48*, 89–94.

Leigh, J. P., Kravitz, R. L., Schembri, M., Samuels, S. J., & Mobley, S. (2002). Physician career satisfaction across specialties. *Archives of Internal Medicine*, *16*, 1577–1584.

Nascher, I. L. (1909). Longevity and rejuvenescence. *New York Medical Journal*, *89*, 795–800.

Siegler, E. L., & Capello, C. F. (2005). Creating a teaching geriatrics service: Ten important lessons. *Journal of the American Geriatrics Society*, *53*, 327–330.

Warren M. (1946). Care of the chronic aged sick. *Lancet*, *i*: 841–843.

Warshaw, G., & Bragg, E. (2006). Longitudinal study of training and practice in geriatric medicine. Available at http://www.adgapstudy.uc.edu/Home/index.cfm.

GERONTOLOGICAL SOCIAL WORKERS

A Demographic Imperative

The need for well-trained social workers in adult day care centers, home health and homemaking programs, mental health centers (both in and out patient), hospitals, and nursing and assisted-living facilities has never been greater. Meeting the demands of the increasing number of older persons and those affected by them, such as caregivers, will become a vital mission of social workers in any setting and at all practice levels (i.e., micro, mezzo, and macro). The exponential growth in the number of older adults, including significant demographic changes in the proportion of ethnic and racial minorities, will have a significant effect on national financing, public policy, and health care utilization.

Social Justice, Ethics, and Values

Perhaps social workers, given their ethical commitments to diversity and social justice in addressing the needs of the underrepresented and the marginal, will be at the vanguard of the helping professions in shaping gerontological care that is culturally appropriate and responsible. Gerontological social workers recognize, for instance, that as cultural representation among older adults continues to rise, those of color will often face greater risks for poor health, social isolation, and poverty. They also understand that cultural beliefs, norms, and language are all key variables in how older adults seek care and services.

Furthermore, gerontological social workers are committed to assessing and addressing values and biases regarding aging, both in others and in themselves. The goal of gerontological social work may be neatly summarized as a mission of respect, where the preeminent concern is to promote older adult clients' right to dignity and self-determination. Whereas, for example, social workers apply ethical principles to decisions on behalf of all older clients, special attention to those with limited decision-making capacity is crucial. An additional area of special ethical attention involves addressing issues relating to dying, death, and bereavement. Gerontological social workers will be in privileged positions to identify issues related to losses, changes, and transitions over the life cycle, particularly as they bear on intervention design. Workers will also be increasingly called on to support persons and families dealing with end-of-life issues, for example, by helping plan advance directives and facilitating the grief process. Indeed, advance care planning, where social workers assess client preferences for care at the end of life, is an area of practice that is increasingly central to gerontological practice (Kass-Bartelmes & Hughes, 2003).

Assessment

Bearing in mind that two-thirds of elderly persons are disabled in some form, with 85% disabled by the age of 90, sound assessment of the biopsychosocial capacities of this population will be critical. Older persons' problems are often complex and involve interrelated biological/health, psychological, social, and cultural dimensions.

Thus, to determine the need for particular resources, it is best for an older adult to receive a comprehensive geriatric assessment. An assessment that involves a very frail older adult with multiple complex needs is ideally conducted by an interdisciplinary team (Damron-Rodriquez & Corley, 2002). Team members from different disciplines collectively set goals and share responsibilities and resources. The client and caregivers may also attend team meetings. The aim of assessment, by examining the current status of an older adult's physical, mental, and psychosocial well-being, is to gain an understanding of the older adults' problems, needs, and strengths in order to develop an intervention plan. In that way, the team can determine the resources needed to improve the person's interpersonal and physical functioning (Greene, 2000a).

Some particular assessment skills are crucial to gerontological social work practice. The use, for example, of empathic interviewing skills to engage older clients in identifying both their strengths and problems is especially important. Along these lines, it is often necessary to adapt interviewing methods to potential sensory, linguistic, and cognitive limitations of the older adult. Ascertaining the health status and assessing the physical functioning (e.g., ADLs and IADLs) of older clients has long been a part of elder care, as has assessing the cognitive functioning and mental health status of older clients (e.g., depression, dementia). Proper biopsychosocial assessment depends on administering standardized assessment and diagnostic tools that are appropriate for use with older adults (e.g., Geriatric Depression Scale, Mini-Mental Status Exam). One of the more recent focuses of assessment involves appraisal of caregivers' needs and level of stress.

The Role and Philosophy of Gerontological Social Workers

One of the chief purposes of social work intervention continues to be to help family members adapt to changes in an older adult's biopsychosocial functioning. Practitioners mobilize the family system on behalf of the older adult (Greene, 2000b). In addition, practitioners deal with transitional tasks, such as retirement and widowhood, which may precipitate a crisis and also direct their attention to past conflicts, roles, alliances, and communication patterns.

Using an ecological approach, practitioners emphasize a healthy, realistic adaptation to problems in living. This multisystemic approach allows practitioners to understand how clients function within their total environment and permits a range of intervention. In addition, the ecological perspective underscores the need for social workers to promote everyday competence among older adults.

Because stress in caregiving is often the entry point for social services, practitioners often continue to assemble the family when dealing with such difficulties. Social workers help families through difficult life transitions, illness, or chronic impairments and to balance caregiving demands. Gerontological social workers base their family interventions on a number of conceptual frameworks, particularly systems theory, the family lifecycle, and issues of interdependence versus dependence to inform family-centered practice models. In family crisis situations, the practitioner takes into account the developmental issues and the changing needs of family members.

Gerontological social work will, through its practice and its philosophy, address itself to the complexities of aging: "Aging is a privilege and a societal achievement. It is also a challenge, which will have an impact on all aspects of society. It is a challenge that cannot be addressed by the public or private sectors in isolation: it requires joint approaches and strategies" (World Health Organization, 2002).

Gerontological Case Management

Because the care an older person may need often involves multiple sources, effective coordination and monitoring of care through case management are essential. Designed to assist individuals and families with multiple service needs, the case-management process is used in various fields of practice including mental health, HIV/AIDS treatment, and services for older adults. The focus of a long-term-care system is the person (and his or her family) whose decreased functional capacity places him or her in a position to need assistance with activities of daily living, such as housekeeping, finances, transportation, meal preparations, or administering medication. The case manager is the person who facilitates the client's movement through the service-delivery system and, the person responsible for ensuring that a client's needs are met. Case management is also conducted at a social systems macro level, with social workers serving as planners and administrators.

Advocacy

To facilitate what the World Health Organization has deemed as crucial for elder care—namely, the joint efforts of public and private domains—advocacy on the part of social workers will be indispensable. Advocacy cuts across multiple points of service delivery: on behalf of clients with agencies and other professionals to help older clients obtain quality services; advocacy and organization with the service providers, community organizations, policy makers, and the public to promote the needs and issues of a growing aging population; and adapting organizational policies, procedures, and resources to facilitate provision of services to diverse older adults and their family caregivers—all with the goal of formalizing changes within an organization and publicizing the process.

Roberta R. Greene
Michael Uebel

See also

Advance Directives
Caregiver Burden
Caregiver Burnout
Case Management
Discharge Planning
Family Caregiver Needs: Assessment
Multidimensional Functional Assessment: Instruments, Overview
Social Supports (Formal and Informal)

Internet Resources

AgeSource Worldwide
http://www.aarp.org/research/agesource/

Alzheimer's Disease Education and Referral Center
http://www.alzheimers.org/generalinfo.htm

Association for Gerontology Education in Social Work
http://www.agesocialwork.org

CSWE Gero-Ed Center, National Center for Gerontological Social Work Education
http://depts.washington.edu/geroctr/

Merck Manual of Geriatrics
http://www.merck.com/mrkshared/mmg/sec1/ch7/ch7a.jsp

REFERENCES

Damron-Rodriguez, J., & Corley, C. S. (2002). Social work education for interdisciplinary practice with older adults and their families. *Journal of Gerontological Social Work*, *39*, 37–55.

Greene, R. R. (2000a). Serving the aged and their families in the 21st century: Using a revised practice model. *Journal of Gerontological Social Work*, *34*(1), 41–62.

Greene, R. R. (2000b). *Social work with the aged and their families*. Hawthorne, NY: Aldine de Gruyter.

Kass-Bartelmes, B. L., & Hughes, R. (2003, March). Advance care planning: Preferences for care at the end of life. *Research in Action*, *12*, 1–18.

McInnis-Dittrich, K. (2002). *Social work with elders: A biopsychosocial approach to assessment and intervention*. Boston: Allyn & Bacon.

World Health Organization (2002). *Active aging: A policy framework*. Geneva.

GERONTOLOGICAL SOCIETY OF AMERICA

The Gerontological Society of America (GSA) is dedicated to promoting the scientific study of aging. It encourages exchanges among researchers and practitioners and fosters the use of gerontological research in forming public policy. It is a leader in the advancement of knowledge, the generation of new ideas, and the translation of research findings into practice.

GSA was founded in 1945 and is the oldest and largest national multidisciplinary scientific organization devoted to the advancement of gerontological research. Its membership includes some 5,000 researchers, educators, practitioners, and other professionals in the field of aging. The society's principal missions are to promote research and education in aging and to encourage the dissemination of research results to other scientists, decision makers, and practitioners. It achieves this by disseminating information; providing networking opportunities;

linking research with policy, practice and education; advocating for increased public and private funding for research on aging; and promoting career development and advancement of its members and development of the next generation of leaders.

Publications

In 50 years, GSA has moved from publishing one journal to publishing five. In 1946, the *Journal of Gerontology* was the first and, for many years, the only U.S. gerontological research journal. In 1995, it became four journals, each with a separate editor and published under two covers: the *Journals of Gerontology: Biological Sciences and Medical Sciences* and the *Journals of Gerontology: Psychological Sciences and Social Sciences*. In June 1954, the society first published the "Newsletter of the Gerontological Society" followed by *The Gerontologist* in 1965, which has evolved into a journal of applied research and analysis in gerontology, including social policy, program development, and service delivery. Other regular features of the journal include essay-style book reviews, audio visual reviews, Practice Concepts, and the Forum, which features review articles or well-documented arguments on a topical issue. The society's *The Public Policy and Aging Report* was added in 1995. The *Report*, a quarterly policy newsletter published by the National Academy on an Aging Society (GSA's independent policy institute), examines policy issues associated with the aging society. The publication is targeted to those outside the academic and traditional aging communities. In 2007, the GSA launched its newest publication, the *Journal of Aging, Humanities and the Arts,* the official journal of the GSA's Humanities & Arts Committee.

GSA also holds an annual conference, sponsors programs, and provides resources, as well as publishing a variety of publications.

EDITORIAL STAFF

Internet Resource

Gerontological Society of America
http://www.geron.org

GLAUCOMA

The glaucomas are a heterogeneous group of diseases of the eye in which the optic nerve, or nerve fibers associated with the nerve, are damaged, often as a consequence of higher than normal intraocular pressure and often associated with characteristic losses in visual field (i.e., peripheral or "side" vision) (Lee & Higginbotham, 2005). *Glaucoma* comes from the Greek *glaucoses* and was described by Hippocrates as a known affliction of the eyes. *Glauco* means *gray and opaque* and probably referred to several conditions of the eye that were not, at the time of Hippocrates, differentiated from what we now know to be glaucoma.

Most cases of glaucoma are due to the inability of the eye to efficiently remove an eye fluid, aqueous, through the anterior chamber angle. As a result, the intraocular pressure increases. Increased resistance to aqueous outflow may occur in the presence of an anatomically open (normal appearance) angle (the exact cause remains incompletely understood) or in cases where the angle is closed (e.g., due to anatomically narrow angles, angle impinged upon by adjacent structures, or other secondary etiology) (Fingeret, 2001). The "angle" refers to the anatomic space through which, aqueous passes. The aqueous is produced behind the iris (the tissue responsible for eye color) at a relatively constant rate and circulates from the back to the front of the iris through the pupil (i.e., the black circle in the middle of the iris). It is filtered out through the angle, also known as the anterior chamber angle. Intraocular pressure (i.e., pressure within the eye) is a result of the balance between aqueous production and resistance to outflow (Fingeret, 2001). The effects of this pressure increase are greatest on the tissues of the optic nerve head, which are located in the back of the eye. The optic nerve head consists of a million or so individual retinal ganglion cells that transmit impulses generated by the sensory retina (i.e., the system of rods, cones, and other interconnections) lining the back of the eye. These impulses travel from the retina to the optic nerve head en route to the occipital cortex of the brain, where the majority of visual information is processed. Prolonged increased intraocular pressure may cause damage to the retinal ganglion cells and the rim of the optic nerve head.

The most common type of glaucoma, Primary Open Angle Glaucoma (POAG), accounts for approximately 80% of all cases (Lee & Higginbotham, 2005). In POAG, the angle, as the name implies, is open and there is no visible obstruction to the outflow of aqueous. Despite this "normal" appearance, the outflow of aqueous is impeded, resulting in increased intraocular pressure.

Other forms of glaucoma include the secondary open-angle glaucomas, which affect 3% of the population; angle-closure of all types, which is found in 5%; and patients who are suspected to have glaucoma but who do not meet all of the diagnostic criteria, which includes 11% of the population.

Glaucoma is among the leading causes of blindness in the world. Global cases are expected to reach 60 million by 2010 and 80 million by 2020, with a corresponding prevalence of glaucoma-related blindness of 8.5 million and 11 million, respectively. Despite the fact that blindness (i.e., blinding eye disease) is among the top most feared diagnoses, patient adherence to treatment and follow-up, like other chronic but often symptom-free conditions (e.g., hypertension, diabetes) is frequently lacking (Fingeret, 2001).

Diagnosis

POAG most frequently occurs in individuals older than the age of 40 and increases in incidence and prevalence with age. Risk factors based on population-based studies include older age, ethnic origin (e.g., patients of African heritage are three to four times more likely to develop glaucoma than their White counterparts), family history, intraocular pressure, the dimensions of the optic nerve head, and the thickness of the center of the patient's cornea (which influences measurements of intraocular pressure and may be related to the development of glaucoma) (Lee & Higginbotham, 2005). It is a matter of debate whether a concurrent diagnosis of diabetes poses additional risk for the development of POAG.

POAG exists in 2% to 3% of the world population and is one of the leading causes of blindness and visual impairment. The probability of blindness or visual impairment in both eyes resulting from glaucoma is approximately 10%; in addition, patients often have other potentially visually disabling conditions associated with age (e.g., cataracts or macular degeneration). Unlike cataracts, which can cause hazy vision, or macular degeneration (i.e., degeneration of the central portion of the retina), which reduces central vision, glaucoma compromises peripheral (i.e., side) vision. This phenomenon is often imperceptible to patients for two reasons: (1) the condition develops very slowly (typically over several years), and (2) a significant portion of the visual fields in each eye overlap each other when both eyes are open; field loss in one eye is often masked by the nonaffected visual field in the other eye (Hatt, Wormald, & Burr, 2006) . The field loss associated with glaucoma generally does not involve central vision until very late in the disease process. In addition, POAG is generally painless. Because of this silent onset, many people with glaucoma are undiagnosed and likely never aware of their condition until it is quite advanced, unless they have periodic eye care and examinations.

Glaucoma screenings, a relatively common practice in some communities, are often little more than a check of the intraocular eye pressure (unfortunately mislabeled "the glaucoma test"). Although high eye pressure is indeed a risk factor for the disease, a pressure reading alone will miss between 35% and 45% of bona fide glaucoma patients in a population (Hatt, Wormald, & Burr, 2006).

There is no one test to diagnose glaucoma. The diagnosis is typically made by either an optometrist or ophthalmologist following a careful history that includes glaucoma risk factors, an assessment of the eye pressure and angle, visual field (side vision) testing, and, most important, an assessment of the integrity of the optic nerve and nerve fibers conducted by looking through a dilated pupil (using eyedrops) to view the nerve and surrounding tissues. The appearance of the optic nerve head/retinal nerve fiber layer may be documented by a detailed drawing, photography (usually stereo photography), or a scanning laser ophthalmoscope.

Glaucoma crisis, or "acute angle closure glaucoma," is a condition in which the anterior chamber angle is anatomically, pharmacologically, or pathogenically closed shut, allowing little or no drainage of the aqueous from the eye. As a consequence, the eye may become painful, red, hazy, and very firm to the touch and the pupils may be fixed (i.e., nonreactive to light) in a mid-dilated position. This condition is well known because of its unique clinical presentation but is relatively uncommon. Patients presenting with this constellation of signs and symptoms should be referred to an eye care provider.

Treatment

After the diagnosis of glaucoma is established, several ophthalmic medications, all of which have potentially significant side effects, may be prescribed (Kanner & Tsai, 2006; Lee & Higginbotham, 2005; Marquis & Whitson, 2005; Tsai & Kanner, 2005). The classifications of medications commonly used in glaucoma, their side effects, dosages, and "color-codes" are summarized in Table G.3.

Many drugs used for other conditions are capable of increasing intraocular pressure. Systemic corticosteroids, which may be used in rheumatologic diseases, asthma, and other conditions, may raise intraocular pressure. Antihistamines and some antipsychotic medications may narrow the anterior chamber angle, which may be problematic for patients at risk for angle closure glaucoma.

Glaucoma is a chronic disease, and patients need counseling to understand that, with rare exceptions, this disease will persist throughout their lifespan; they will be taking medications and/or they may need to undergo laser or surgical procedures to increase the efficiency of the drainage system of the eye or to surgically create a new, alternative drainage system. In the early phases of treatment, several different medications, alone or in combination, may be used in an effort to find an appropriate treatment (Kanner & Tsai, 2006; Lee & Higginbotham, 2005; Marquis & Whitson, 2005; Soltau & Zimmerman, 2002). Throughout treatment, medication doses or types may need adjustment. Most glaucoma patients require visits to an optometrist and/or ophthalmologist at least three to four times per year. Opticians do not treat or diagnose glaucoma.

Patient compliance (adherence) is a serious problem in the management of glaucoma. Factors influencing adherence include the patient's understanding of the condition, ability to self-medicate (taking eyedrops can be a challenge), the silent nature of the disease, the chronic nature of the disease, insurance/managed care/cost issues with regard to purchasing medication, and access to continuing care (most postoperative costs are covered by Medicare).

If progression continues despite the use of medications, surgical options may halt further loss. As with any surgical procedure, there are risks associated with the procedure and postoperative course. New cataract formation occurs in up to 10% of surgically managed cases, and potentially sight-threatening infections occur in 1% to 2% of all cases. The postoperative course generally runs about 30 days; however, infections may occur much later (even beyond 1 year) (Fingeret, 2001).

Even under the best of circumstances (i.e., proper diagnosis and treatment and a patient who follows the treatment regimen), the disease can progress and cause visual impairment. Disease progression typically occurs very slowly, over the course of years. As peripheral vision worsens, patients may experience a compromised awareness of objects that appear to either side of them. They may complain of discomfort in crowded or busy environments (e.g., walking on a busy street) where objects and people appear to abruptly enter their line of sight. These patients are at risk of losing their ability to orient themselves and/or navigate through unfamiliar environments, and their quality of life can become seriously impaired.

Counseling, techniques to regain orientation, mobility training, and a low-vision examination are important at this time. Continued education regarding the course and nature of glaucoma and address-

TABLE G.3 Commonly Used Glaucoma Medications

Classification	Trade Names	Cap Color	Side Effect
Beta blockers	Timoptic, Betimol*, Betagan, Ocupress*, Betoptic, OptiPranolol*	0.5% yellow 0.25% blue *white cap	Bronchospasm, slows heart rate, depression, Impotence
Prostaglandin analogs	Xalatan, Travatan, Lumigan	white/teal	Eye inflammation
Alpha adrenergic agonists	Alphagan, Iopidine, Combigan^{+}	purple, white	Eye allergic reaction Dry mouth, fatigue
Carbonic anhydrase inhibitors	Trusopt*, Azopt**, Cosopt***	Orange label on top of white cap, orange cap *** Dark blue label on top of white cap	Bitter taste, *stings **Stings less

***A combination of 5% beta blocker and carbonic anhydrase inhibitor.
$^{+}$A combination of Alphagan and Timolol

ing concerns about loss of independence associated with vision problems are among the key goals of counseling. Orientation and mobility training seek to maximize the patient's ability to move independently, safely, and purposefully and may or may not include the use of a cane (e.g., the familiar "white cane"). In addition to a standard eye exam, the low-vision examination includes a comprehensive assessment of the degree of usable vision; the patient's visual goals, objectives, and expectations; and the assessment of devices to augment usable vision.

Patients who report a visual disability or challenges in the performance of activities of daily living as a result of glaucoma should have a comprehensive low-vision examination by an optometrist or ophthalmologist who specializes in low-vision care. Referrals to settings were the patient independently chooses among a cadre of low-vision devices in the absence of professional guidance or prescription is often fruitless and a waste of time and money.

Using eyedrops can be a challenging task. One way to ensure the drop is instilled correctly is to have the patient gently pull the skin of the lower eyelid between the thumb and index finger to create a "pocket" for the drop. While looking up, the patient gently squeezes the bottle so that a drop falls into this pocket. Prior to drop instillation, care must be taken to wash hands and not to touch the tip of the bottle with any surfaces, including the eyelids and lashes. Patients should instill one drop at a time and gently close the eye following instillation. The patient may also be instructed to press on the opening of their tear duct (i.e., the inside corner near the bridge of the nose where the upper and lower lids meet). This helps to keep the medication from being flushed out of the eye and into the tear drainage system. The patient should maintain this position for at least 5 minutes per drop so that absorption into the ocular tissues is enhanced.

Older patients must understand the need for regular eye care. Patients cannot afford to wait until they experience symptoms before seeking care. Elderly patients should have a comprehensive eye examination annually. It is also important to ask specifically if the patient is currently using or has ever used eyedrops. If the patient is a known glaucoma patient, questions should be asked regarding compliance and follow-up with his or her eye care provider. If the patient is visually impaired as a result of glaucoma, the patient should be addressed face to face in an effort to optimize the chances of being in the patient's line of sight.

Mitchell W. Dul

See also

Assistive Technology
Low Vision
Vision Changes and Care
Vision Safety

Internet Resources

American Academy of Optometry
http://www.aaopt.org/

American Optometric Association
http://www.aoanet.org/

Association of International Glaucoma Societies
http://www.globalaigs.org/

The Glaucoma Foundation
http://www.glaucoma-foundation.org

National Eye Health Education Program
http://www.nei.nih.gov

Optometric Glaucoma Society
http://www.optometricglaucomasociety.org

REFERENCES

Fingeret, M. (2001). *Primary care of the glaucoma*s. Norwalk, CT: Appleton and Lange.

Hatt, S., Wormald, R., & Burr, J. (2006). Screening for prevention of optic nerve damage due to chronic open angle glaucoma. *Cochrane Database of Systematic Reviews*, *18*(4).

Kanner, E., & Tsai, J. C. (2006). Glaucoma medications: Use and safety in the elderly population. *Drugs and Aging*, *23*(4), 321–332.

Lee, D. A., & Higginbotham, E. J. (2005). Glaucoma and its treatment: A review. *American Journal of Health-System Pharmacy*, *1. 62*(7), 691–699.

Marquis, R. E., & Whitson, J. T. (2005). Management of glaucoma: Focus on pharmacological therapy. *Drugs and Aging*, *22*(1), 1–21.

Soltau, J. B., Zimmerman, T. J. (2002). Changing paradigms in the medical treatment of glaucoma. *Survey of Opthalmology*, *47*(Suppl. 1), S2–S5.

Tsai, J. C., & Kanner, E. M. (2005). Current and emerging medical therapies for glaucoma. *Expert Opinion on Emerging Drugs*, *10*(1), 109–118.

GRANDPARENTS AS FAMILY CAREGIVERS

The U.S. Census Bureau reports that there are 6 million children living in households headed by grandparents and other relative caregivers. Of these, 2.4 million grandparents are responsible for the children living with them (U.S. Census Bureau, 2003 & 2004). Grandparents, who are the primary caregivers of children, face the joys of a close relationship with their grandchildren as well as the struggles to keep their families together. The reasons for caregiving include death of a parent, incarceration, teen pregnancies, mental illness, abuse and neglect, HIV/AIDS, substance abuse, and, recently, active duty in the military. The challenges of raising children, especially those with mental or physical disabilities, can be overwhelming. The inability to access child care is a barrier to much-needed doctor's visits, socialization, and employment. These issues are compounded when grandparents live in rural areas, isolated from social service providers and lack information or transportation to access available services.

Physical and Mental Health

Chronic health problems have been reported in studies of Hispanic, White, and African American grandparents raising grandchildren (Goodman & Silverstein, 2002). Grandparents often neglect their own physical health by skipping or postponing medical appointments in order to meet the needs of the children in their care. In addition to the stress on their physical health, caregivers and children have mental health needs (Minkler, Fuller-Thomson, Miller, & Driver, 2000; Solomon & Marx, 2000). Grandparents care for children with behavioral, physical, and emotional issues. They care for children who suffer from separation anxiety, loss and grief, feelings of abandonment; whose parents have AIDS or are substance abusers; and children who have witnessed violence or experienced abuse or neglect and act out as a result of this trauma. While trying to address their own anger, depression, resentment, and embarrassment, grandparents may also be faced with trying to restore parent–child relationships in a positive way that nurtures the entire family. Access to available health insurance may also affect the ability of the family to address these important issues.

Legal Issues

Although caregivers are often able to make day-to-day decisions without a legal relationship, they face challenges like the ability to enroll children in school, access school records, or consent to their medical care (Flint & Perez-Porter, 2000). These challenges can be especially difficult for caregivers who are responsible for children with a mental or physical impairment that requires hospitalization, medical exams, or special education. Grandparents, with or without a legal relationship to the children in their care, need information and education about available benefits and about their legal decision-making authority. They also need assistance to obtain that legal authority, when necessary.

Economic Challenges

Grandparent caregivers may be retired or live on limited incomes. Although children may be eligible for child only Temporary Assistance to Needy Families (TANF) grants, Food Stamps, Medicaid, state-sponsored Supplemental Children Insurance Program (SCHIP), or Social Security benefits, grandparents may have difficulty navigating a system of public benefits that was not intended to assist nonparents. This often results in the inability to access much-needed financial assistance. Other possible sources of support, like subsidized guardianships or adoption subsidies, are usually limited to children who have been in the foster care system.

Housing Needs

Finding quality, affordable housing is a significant challenge for grandparents who are primary caregivers. Many grandparents may need larger apartments to accommodate the children in their care, whereas others face eviction for lease violations (Fuller-Thomson & Minkler, 2003). Grandparents who live in housing for the elderly are especially vulnerable because children are not allowed in these senior housing complexes.

Respite

Respite, a break from the challenges of caregiving, is also greatly needed. It provides an opportunity for socialization, doctor's appointments, or rest. The provision of recreational and educational activities for children can provide grandparents with the time off they need to "recharge their batteries." When clearly defined, easily accessible, creative, and flexible, respite can help caregivers face their caregiving responsibilities (Generations United, 2005).

Collaborative Partnerships

With the growing awareness of grandparents as parents, a number of resources and services have been developed to address their unique issues. Collaborations at the local, state, and national levels with public, private, and nonprofit groups have also helped the creation or expansion of programmatic opportunities for caregivers.

The Brookdale Foundation's Relatives as Parents Program (RAPP) provides yearly seed grants to community-based nonprofit organizations across the country and state public agencies to provide direct services and to stimulate the creation and expansion of services to grandparents and other relatives raising children. Support groups are the most widespread method for addressing the support and educational needs of grandparent caregivers (Cohen & Pyle, 2000).

The AARP Grandparent Caregiver Information Center (GIC) lists support groups nationwide and offers a Web site with articles and message boards, booklets in English and Spanish, and the GIC Voice, a free newsletter for grandparents who are raising their grandchildren.

Generations United (GU) is a national membership organization focused on improving the lives of children, youth, and older people through intergenerational strategies, programs, and public policies. GU is a valuable resource for educating policy makers and the public about the economic and social needs of grandparent caregivers and their families.

The Children's Defense Fund has developed informative materials for relative caregivers on health, financial assistance, and subsidized guardianship. Sponsored by the joint efforts of the Children's Defense Fund, GU, AARP, Child Welfare League of America, and the National Committee of Grandparents for Children's Rights, GrandRallies have been held in Washington, DC, to educate members of Congress and their staff about needed supportive services for this population. Smaller GrandRallies have subsequently been held at state and local levels across the country.

The U.S. Census Bureau

The U.S. Census Bureau has contributed to the growing awareness of the unmet needs of relative caregivers by providing data on the number of caregivers at the state, local, and county levels. These data have made it possible for advocates, researchers, and service providers to document the need for services in the communities they serve.

Cooperative Extension Programs are publicly funded and delivered through an educational network that combines the expertise and resources of the federal government–USDA, land-grant universities in every state and territory, and local Extension educators at the community level. Educational forums and seminars, resource directories, newsletters, community trainings, local and state conferences, Web sites, and chat rooms are some examples of their leadership role to improve the quality of life of relative caregiver families across the nation.

State Fact Sheets, a collaboration of AARP, Children's Defense Fund, The Brookdale Foundation, Casey Family Programs, the Child Welfare League of America, and GU contain the most up-to-date state information about the issues, needs, and programs available, at the state and local level, to grandparents and other relative caregivers.

Legislation

The Administration on Aging's National Family Caregiver Support Program (NFCSP) was established as part of the 2000 Amendments to the Older Americans Act. The NFCSP specifically designates funding, a maximum of 10%, for supportive services to grandparents and other relatives older than the age of 60 who are raising children. Available services include information and referral, individual counseling, support groups, caregiver training, respite care, and supplemental services.

In response to the lack of affordable housing, several organizations have partnered to create housing opportunities for grandparents raising grandchildren. Two examples are Grandfamilies House, the first housing complex for grandparents and their grandchildren, in Boston, Massachusetts, and GrandParent Family Apartments in the Bronx, New York, sponsored by Presbyterian Senior Services and West Side Federation for Senior and Supportive Housing. A critical component for any intergenerational housing is the provision of in-house supportive services for both seniors and children, including case management.

The housing needs of grandparents who are primary caregivers of their grandchildren have also been recognized by federal law. The Living Equitably: Grandparents Aiding Children and Youth (LEGACY) legislation enables the Housing and Urban Development (HUD) Corporation to implement pilot programs to create affordable-housing opportunities for grandparents and other relatives older than the age of 60 who are raising children. Included in the legislation is the education and training of housing officials on policies that affect these families and work with the Census Bureau to conduct a national study of the housing needs of relative caregivers.

Some states have enacted legislation to make it easier for caregivers to provide support and care for the children they are raising. Consent laws give caregivers without a legal relationship the authority to enroll children in school and/or obtain medical care for them. Kinship Navigator programs, available in a few states, assist caregivers by helping them identify and apply for eligible benefits. Proposed federal legislation would ensure that Kinship Navigator programs are offered in all states to help caregivers navigate and access available public benefits.

Many programs funded at the federal, state, and local levels have created or expanded services to address the needs and issues identified herein. It has been exciting to see the growth of services to caregivers and their families in the last 10 years, but much still remains to be done to ensure that this special population of relative caregivers and the children they are raising have the support needed to keep their families together.

Melinda Perez-Porter
Rolanda Pyle

See also

Family Care for Elders With Dementia
Family Care for Frail Elders
Intergenerational Care
Respite Care
Support Groups

Internet Resources

Administration on Aging, NFCSP
www.aoa.org

AARP Grandparent Information Center
www.aarp.org

Brookdale Foundation Relatives as Parents Programs
www.brookdalefoundation.org

Child Welfare League of America
www.cwla.org

Children's Defense Fund
www.childrensdefense.org

Generations United
www.gu.org

The U.S. Census Bureau
www.census.gov

REFERENCES

Cohen, C. S., & Pyle, R. (2000). Support groups in the lives of grandmothers raising grandchildren. In C. B. Cox (Ed.), *To Grandma's house we go and stay: Perspectives on custodial grandparents* (pp. 235–252). New York: Springer Publishing Company.

Flint, M. M., & Perez-Porter, M. (2000). Grandparent caregiving: Legal status issues and state policy. In C. B. Cox (Ed.), *To Grandma's house we go and stay: Perspectives on custodial grandparents* (pp. 132–148). New York: Springer Publishing Company.

Fuller-Thomson, E., & Minkler, M. (2003). Housing issues and realities facing grandparent caregivers who are renters. *The Gerontologist*, *43*, 92–98.

Generations United (2005). Grandparents and other relatives raising children: The second intergenerational action agenda. *Respite Services*, 38–41.

Goodman, C., & Silverstein, M. (2002). Grandmothers raising grandchildren: Family structure and well-being in culturally diverse families. *The Gerontologist*, *42*, 676–689.

Minkler, M., Fuller-Thomson, E., Miller, D., & Driver, D. (2000). Grandparent caregiving and depression. In B. Hayslip, Jr., & R. Goldberg-Glen (Eds.), *Grandparents raising grandchildren: Theoretical, empirical and clinical perspectives* (pp. 207–219). New York: Springer Publishing Company.

Solomon, J. C., & Marx, J. (2000). The physical, mental, and social health of custodial grandparents. In B. Hayslip, Jr., & R. Goldberg-Glen (Eds.), *Grandparents raising grandchildren: Theoretical, empirical and clinical perspectives* (pp. 183–205). New York: Springer Publishing Company.

U.S. Census Bureau. Grandparents living with grandchildren (2000). *Census 2000 Brief,* October 2003, http://www.census.gov/prod/2003pubs/c2kbr-31; Children and the Households They Live In: 2000, Census 2000 Special Reports, February 2004 http://www.census.gov/prod/2004pubs/censr-14.pdf

GROUP PSYCHOTHERAPY

Group psychotherapy is an effective and valuable approach to many of the mental and emotional challenges of late life. Elderly persons may reject the concept of psychotherapy on an individual basis but benefit from the supportive interactions and environment found in a group setting (Haight, 2005). Many older adults are more accepting of psychotherapeutic interventions than of medications when offered options for mental health treatment (Landreville, Landry & Baillargeon, 2001). Clinical and empirical evidence shows that group psychotherapy is an effective treatment modality, particularly for specific symptoms of depression, anxiety, and life stressors such as loss and bereavement (Yalom & Leszcz, 2005). The applications of group therapy are abundant and offer motivated clinicians a rich venue for treatment of the mental health needs of older adults. As with all forms of psychotherapy, individual acceptance, engagement, and response to treatment will vary. The social support, stimulation, and opportunity to engage in the shared experience of a group are often of particular benefit to the elderly.

Group therapy is a flexible model that can be utilized in a variety of settings, including senior and community centers, outpatient clinics, mental health centers, nursing homes, assisted-living facilities, and hospitals. Group therapy helps to reinforce the social nature of our life and may reduce the loneliness, isolation, boredom, and hopelessness that are often the pathway to depression, functional decline, and excess disability in older adults (Toseland, 2004).

Indications

Group therapy may be utilized to focus on specific symptoms or themes, such as depression, anxiety, bereavement, loneliness, boredom, loss, and issues of aging. Another focus may be specific illnesses, such as Parkinson's disease, arthritis, cancer, chronic pain, or issues of coping with disability. A group may be identified by the therapeutic modality chosen, including reminiscence or life review, cognitive-behavioral models, psychodynamic therapy, and support groups for caregivers. Group therapy may focus on specific activities such as mastering phobias, smoking cessation, or increasing social activity, with the goal of task completion.

The Therapeutic Process

Preparation and screening of potential members prior to initiation of group therapy are essential to a successful outcome (Yalom & Leszcz, 2005). Elderly candidates for group therapy should be screened for the presence of acute illness, cognitive loss, and willingness to participate. A psychiatric diagnostic interview and mental-status examination should be performed. Heterogeneous groups are more likely to fail if the population includes those with dementia, severe physical or sensory disabilities, or language barriers. Homogeneous groups based on symptoms, disease state, and goals of treatment are more likely to become cohesive, successful, and therapeutic. A structured group format with well-defined goals is most likely to be successful with older adults. Patients who are experiencing an acute crisis, are suicidal, or those who require immediate treatment are not appropriate candidates for most therapy groups (Toseland, 2004). Cognitive loss, sensory deficits, personality disorders, and language differences can often be accommodated in specialized group settings (Haight, 2005).

The purpose and goals of the group therapy should be clearly stated and addressed at the start. The group leader must take an active role in facilitating communication and interaction among group members. The goals of individual group members must be explored and addressed to avoid conflict. The therapist must actively encourage interaction and feedback among group members. Often, the therapeutic group is a new entity to older adults, who may be uncertain and reluctant to participate at the start of treatment. As with all group participants, older adults require support, recognition, and acceptance to develop a therapeutic relationship. Once engaged in treatment, elderly patients are more likely to complete a course of therapy than younger adults (Landreville et al., 2001).

Group members typically exhibit a wide range of differences in self-esteem and in their tendency to be either passive or aggressive in response to the group setting. Jealousy, envy, and resentment toward other group members and the therapist are common and need to be addressed through gentle support and reflection. The concept of mutual support and aid among group members should develop over time. If time and staffing permit, a group-therapy co-leader is recommended whenever possible. This allows for an objective view by another clinician who can serve as a source of support and interpretation. Ongoing professional supervision and training are important to maintain objectivity, promote the efficacy of interventions, and promote quality of the therapy (Yalom & Leszcz, 2005).

Applications

Reminiscence therapy, also called life review, is a means by which elderly persons can evaluate and reintegrate their lives. Reminiscence can greatly increase life satisfaction when an individual is able to acquire a sense of self-esteem, accomplishment, and completion (Butler, 1963). Group therapy focusing on reminiscence with patients suffering from depression has shown improvement in mood and is highly accepted by participants. Reminiscence groups are among the most common types utilized with patients suffering from dementia. Although the direct benefit to patients in terms of mood, behavior, or cognitions has not been conclusive, studies have shown that participants and groups leaders report high levels of satisfaction with the programs. Caregivers of participants report reduced levels of stress and an increase in awareness of the patient's history and interests (Woods, Spector, Jones, Orrell, & Davies, 2004).

Caregivers of patients with dementia almost universally suffer from burden, anxiety, and often depression. Support groups for caregivers may reduce depression, alleviate anxiety, improve problem solving, and delay the need for nursing-home placement. Such support groups do not improve the cognitive status or abilities of patients with dementia. The focus of these groups is to increase the coping skills of those providing care utilizing education, behavioral interventions, mutual support, and reducing isolation (Haight, 2005).

Group therapy for older adults with dementia can be an effective means of maintaining interpersonal skills and promoting a sense of self. Modeling and positive reinforcement by the group leader are vital to success. Psychodynamic and formal cognitive-behavioral techniques such as interpretation and homework assignments are not appropriate for a cognitively impaired population. Groups directed toward persons with mild and newly diagnosed dementia in the early stages have been very useful in helping to address issues of dependency and loss (Haight, 2005).

Group therapy in nursing homes is often used as a means of social support, to increase activity level, and to maintain self-esteem and dignity. Consideration must be given to the cognitive status of group members, with adjustments made to accommodate memory impairments and sensory losses. Approaches that focus on maintaining individual identity and self-worth in the context of institutional life have been very productive (Yalom & Leszcz, 2005).

Reimbursement

Group psychotherapy is reimbursable under Medicare Part B, Medicaid, and private insurance plans from eligible providers. Current Procedural Terminology (CPT) codes 90853 and 90857 are applicable to group psychotherapy. Group therapy offered in hospital settings may be billed using inpatient codes. Appropriate documentation for each member in attendance must be provided. Because patients are often evaluated individually before placement in a group, these visits are reimbursable using codes appropriate to the level of service provided. Many managed-care plans find group therapy financially attractive for their members, but the practitioner must follow the procedures for authorization, treatment-plan documentation, and coverage limitations for the specific carrier. Unlike Medicare and Medicaid, managed-care plans are likely to limit the number of sessions to a contracted maximum. These issues need to be addressed both individually and with the group (Yalom & Leszcz, 2005).

Group psychotherapy is an effective means of dealing with the vulnerabilities that accompany the aging process. Older adults may be more likely to engage in group rather than individual therapy, in part because it is often perceived as less intense or less threatening. The role of the therapist is one of active listening, reflection, and balancing the needs of the individual with the growth of the group as a whole. Group size may range from as few as three participants to as many as 10. Group size should be limited to six to eight members if cognitive impairment is present (Haight, 2005).

MELINDA S. LANTZ

See also
Life Review
Mental Health Services

Internet Resources
American Group Psychotherapy Association
www.agpa.org

American Psychological Association
www.apa.org

Center for the Study of Group Processes
www.uiowa.edu/~grpproc/index

Family Caregivers Alliance
www.caregiver.org

International Society for the Study of Personal Relationships
www.isspr.org

REFERENCES

Butler, R. N. (1963). The life review: An interpretation of reminiscence in the aged. *Psychiatry*, *26*, 65–75.

Haight, B. (Ed). (2005). Burnside's working with older adults: Group process and technique (4th Ed.). New York: Jones & Bartlett Publishers, Inc.

Landreville, P., Landry, J., & Baillargeon, L. (2001). Older adults' acceptance of psychological and pharmacological treatments for depression. *Journals of Gerontology: Psychological Sciences and Social Sciences*, *56*(5), 285–291.

Mackin, R. S., & Arean, P. A. (2005). Evidence-based psychotherapeutic interventions for geriatric depression. *Psychiatric Clinics of North America*, *28*(4), 805–820.

Toseland, R.W. (Ed). (2004). *An introduction to group work practice* (5th Ed.). Boston, MA: Allyn & Bacon.

Woods, B., Spector, A., Jones, C., Orrell, M., & Davies, S. (2005). Reminiscence therapy for dementia. *Cochrane Database System Review*, *2*, CD001120.

Yalom, I. D., & Leszcz, M. (Eds.). (2005). *The theory and practice of group psychotherapy* (5th Ed.). New York: Basic Books.

GUARDIANSHIP AND CONSERVATORSHIP

One of the most difficult situations for a family member or health care provider to face is an older adult who has become unable to make day-to-day decisions, potentially making them vulnerable to abuse and neglect. Aside from the anguish this causes all parties, the issue quickly becomes one of providing sufficient but not intrusive assistance, once the adult's ability to make financial and/or medical decisions is compromised. Guardianship is the most drastic intervention because it represents the partial or total removal of the person's civil rights and appoints a surrogate to make decisions on his or her behalf. However, many states strive to impose guardianship within the context of the principle of the "least restrictive alternative."

Guardianship, called conservatorship in some states, is usually divided into two types: personal and estate (or property). The terminology differs from state to state, but here the term *guardianship* refers to guardianship of both the person (the ward) and the property. Few jurisdictions actively track the number of adult guardianships in their area (Government Accountability Office, 2004).

All jurisdictions are empowered to appoint a guardian for any adult who is determined to lack the ability to make his or her own decisions, but the standards for that determination differ. In most states, a court investigator or an examining committee makes a formal assessment. These assessments are based on the adult's functional and cognitive capacity. If a person is judged to lack the capacity to make personal or financial decisions and has not already designated a surrogate through an advance directive, a guardian will be appointed for the person and/or the property, as the circumstances warrant.

There is increasing recognition that older adults may be able to make some decisions while they lack the capacity to make others. For example, older adults may not be able to make medical-treatment decisions but may be quite capable of determining other aspects of their personal lives, such as where they will live. To provide an option that can be tailored to the individual's ability, most states allow for limited guardianship—removing the right to make only certain decisions. However, the limited-guardianship option is seldom used because many judges and lawyers believe that because the older adult's condition will continue to deteriorate, eventually requiring full (i.e., plenary) guardianship (Wilber & Reynolds, 1995).

Initiating Guardianship Proceedings

An older adult with impaired capacity often comes to the attention of a family member or a neighbor, who notifies the police or adult protective services. The precipitating factor can include such things as possible elder mistreatment, undue influence, inability to perform activities of daily living (ADL) or pay bills, and the like. In these cases, the need for medical decision making often prompts the petition for guardianship.

Once a guardian is believed necessary, a petition is filed with the probate court. The petition provides information to the court on the person's physical and mental condition and the next of kin. The petition may include a request to appoint a guardian, but in some states (e.g., Florida), a separate application for guardianship appointment is necessary. In many states, an attorney must file the petition.

Once a petition is filed, the probate court will hold a hearing to rule on whether to appoint a guardian and who that will be. Many states have a process where formal assessment of the proposed ward is ordered, prior to the hearing. The adult in question, the next of kin, and any attorneys involved receive notice of the hearing and have the right to be present and to contest the guardianship.

Appointing a Guardian

Most often, the family member closest to the adult in question, either emotionally or geographically, is appointed as the guardian. In many cases, however, adult children do not live nearby or get along with one another. Appointing an adult child as guardian in such circumstances can become a logistical or emotional problem.

Many states provide for the appointment of a public guardian if there is no one else to act in this role. For older adults with sufficient funds, a bank trust department or attorney can be hired to act as guardian. These services tend to be expensive and are clearly not accessible to everyone. In states that do not have public guardians, a professional guardian can be appointed; this professional can be a geriatric care manager, individual or company professional guardians, or a social services agency.

Appropriate guardianship varies with the circumstances of the person who needs protection. In some states, an older adult can file a pre-need guardian statement, informing the court which individual the person chooses as guardian should one ever be needed. Otherwise, two factors are paramount: the nature of the relationship and potential conflicts of interest. In the former case, the issue of emotional closeness and trust must be weighed against family dynamics, ability to manage finances, and proximity (see Wilber & Reynolds, 1996, for a discussion of relationships and financial exploitation). In the latter, the person or entity appointed as guardian should not also be providing medical or social services (see Kapp, 1999, p. 155, for a discussion of this type of conflict).

Responsibilities of a Guardian

Guardians of the person must make decisions regarding all kinds of health care, as well as place of residence and other aspects of the person's social life. Their duties typically include but are not limited to the following:

- complying with all filing requirements (the probate court will inform individuals of the specifics in each state)
- complying with the rules of the jurisdiction for procedures such as changing the residence of the ward, charging a guardian's fee, or any other

action that requires court approval (this varies by state and county)

- determining where the ward will live and under what circumstances (e.g., at home or in an assisted-living facility, nursing home, or other placement; alone or with others; receiving or not receiving at-home or community services)
- consenting to or refusing on behalf of the ward any medical, surgical, or behavioral treatments recommended by the ward's medical providers
- terminating life support

Most courts require an annual filing describing any actions the guardian has taken to protect or improve the ward's life and what the guardian plans to do for the ward in the coming year.

Even when a guardian of the person has been appointed, there is no substitute for the vigilance of a caring family member or professional. Although a particular guardian may rarely interact with the ward, the guardian can be an advocate for the person. For instance, a geriatric care manager, who identifies a patient as overmedicated but lacks the authority to change clinicians or suggest a specialist referral, could involve the guardian in the plan of care. By combining the professional's knowledge of the patient and the advocacy role of the guardian, the best for the patient can be ensured.

Guardians of the property have similar filing requirements to guardians of the person. They are charged with receiving all assets and filing an inventory of the ward's property as soon as possible. Many states put a time limit on the filing of an inventory (e.g., 30 or 60 days), but an amended inventory can be filed if subsequent property is found. The guardian must then file a periodic accounting of all income received, bills paid, and property bought and sold on behalf of the ward. In addition to these duties, the guardian of the property has to insure the assets of the estate; pay the ward's living expenses; invest the assets according to the "prudent person" rule; employ attorneys, investment advisers, and other professionals as needed; buy and sell property, including real estate; and pay burial and funeral expenses (some states consider this the duty of the executor, not the guardian). Many of these actions require the prior approval of the court.

Conclusion

The role of the guardian of the property is critical and highlights the importance of having a caring professional, family member, or friend who is alert to the situation. Although the guardian is responsible to the court and to the ward for the care provided and usually has all-encompassing power over the ward, all it takes to replace a guardian is a petition to the court and a subsequent hearing.

Fortunately, most guardians are diligent, caring, and careful people who treat their wards well. Under the right circumstances, having a guardian for an impaired older adult can be an enormous relief to the family, to providers, and most important, to the ward.

Sandra L. Reynolds
Paul Stiles

See also

Advance Directives
Competency and Capacity
Elder Mistreatment: Overview
Elder Neglect
Financial Abuse
Mental Capacity Assessment
Money Management

Internet Resources

ABA Commission on Law and Aging: Guardianship
www.abanet.org/aging/guardianship.html

Facts About Law and the Elderly, American Bar Association
www.abanet.org/media/factbooks/eldtoc.html

National Guardianship Association
www.guardianship.org

REFERENCES

Kapp, M. B. (1999). *Geriatrics and the law: Understanding patient rights and professional responsibilities.* New York: Springer Publishing Company.

U.S. Government Accountability Office (GAO) (July 2004). *Guardianships: Collaboration needed to protect incapacitated elderly people*. Washington, DC: U.S. Government Accountability Office. Available at www.gao.gov/new.items/d04655.pdf#search=‘number%20of%20people%20guardianship’

Wilber, K. H., & Reynolds, S. L. (1995). Rethinking alternatives to guardianship. *The Gerontologist*, *35*, 248–257.

Wilber, K. H., & Reynolds, S. L. (1996). Introducing a framework for defining financial abuse of the elderly. *Journal of Elder Abuse & Neglect 8*(2), 61–80.

H

HARTFORD INSTITUTE GERIATRIC NURSING RESEARCH SCHOLARS PROGRAM

Every year, 12 Hartford Institute Geriatric Nursing Research Scholars have an in-depth mentoring experience with nationally recognized gerontologic nursing researchers at a week-long, intensive summer seminar at New York University.

The goals of the seminar are as follows:

(1) to foster successful programs of gerontologic research with significant implications for practice
(2) to assist in the refinement of a program of significant research
(3) to hone specific research skills and gain a competitive edge for funding

By the end of the program, scholars will have discussed and critically analyzed a variety of research problems, advanced and refined an individual program of research, and refined their skills and knowledge of research.

Scholars are selected through a competitive process. They participate in seminars and work on refining their own research through group analysis and feedback.

Editorial Staff

Internet Resource

Hartford Institute Geriatric Nursing Scholar & Fellows Program
http://www.hartfordign.org/research/scholarsFellows/index.html

HEADACHE

Headache is not usually associated with significant underlying pathology. Occasionally, however, underlying disease is undetected because headache is such a common complaint, reportedly as high as 17% in a population-based cohort of elderly (Cook et al., 1989). Despite its benign nature, headache often has a significant impact on quality of life and productivity.

Although headache in older and younger adults is similar in most respects, there are some notable differences in symptomatology and epidemiology. Some causes are unique to the elderly, such as temporal arteritis. Signs and symptoms of the underlying cause may also be different, such as the absence of fever and neck stiffness in meningitis. Thus, it is important to take the complaint of headache seriously and begin the evaluation with the idea that the headache could be secondary to an underlying disease. The most important tools for evaluating headache in geriatric patients are the history and physical and neurological examinations. Subsequent diagnostic testing should be guided by the information gained during the clinical evaluation. Imaging is overutilized and may be obviated by careful clinical assessment.

Secondary Headache

During the initial evaluation, the physician must differentiate underlying pathology causing a symptomatic headache (i.e., secondary headache) from the more benign primary headache, in which the headache itself is the primary problem. The prevalence of secondary headache increases with age (Lipton, Pfeffer, Newman, & Solomon, 1993).

Therefore, underlying causes should be considered before diagnosing the more benign primary headache (e.g., tension-type headache).

Giant cell arteritis is a granulomatous vasculitis involving large arteries, including the carotid, vertebral, and temporal arteries. It classically presents with scalp tenderness; temporal headache with tender, enlarged temporal arteries; and jaw claudication. It may occur in association with polymyalgia rheumatica, with a history of several months of malaise, weight loss, generalized weakness, myalgias, and low-grade fever. Diagnosis is based on clinical suspicion, supported by an elevated erythrocyte sedimentation rate, and must be confirmed by temporal artery biopsy. Expeditious treatment with corticosteroids is imperative to prevent compromise of vision (Gonzalez-Gay et al., 2005).

Other central nervous system pathology that causes headache includes intracranial hemorrhage, mass lesions, and meningitis. In the elderly, subdural hematoma can be present in the absence of focal neurological signs or a history of identifiable trauma. Signs and symptoms suggestive of secondary headache that require further investigation include new headache; significant change in preexisting headache, such as severity, frequency, characteristics, or location; any focal neurological signs or symptoms; nausea and vomiting without a history of migraine; fever; meningismus; prior history of malignancy; sudden, severe, explosive headache; personality change or drowsiness; progressively worsening headache; and seizures.

Causes outside the nervous system that should be kept in mind during the initial evaluation include referred pain from dental disease, sinusitis, glaucoma, and other disorders of the head and neck. Medication-induced headaches always need consideration and can be caused by introduction of a new drug or the withdrawal of certain substances (Lipton et al., 1993).

Primary Headache

Primary headache is categorized into definable entities that suggest prognosis and can facilitate appropriate treatment.

Cervicogenic headache is pain originating primarily from disease in the neck. Pain due to disease in the upper cervical regions can be referred to all parts of the head, especially the occipital region, but also the frontal, temporal, parietal, and even orbital regions. Neck pain may not be a prominent complaint in some patients; direct questioning is necessary to elicit these symptoms and a history of neck trauma. Neck crepitus and cervical paraspinal tenderness are usually present. Results of cervical-spine imaging studies must be interpreted carefully, considering the clinical picture. Significant cervical-related head pain may occur in the setting of normal radiographic studies; similarly, asymptomatic patients may have significant cervical spondylosis.

For headache associated with cervical-spine dysfunction, treatment involves explaining the cause of the pain, prescribing physiotherapy, and educating the patient about ergonomics, such as using a firm pillow or a cervical collar. Pain can be initiated or exacerbated by long-distance driving and prolonged time spent typing or using a computer, and the patient should be taught how to avoid holding the neck in one position for long periods, especially in positions in which there is excessive neck flexion, extension, or torsion. Analgesic therapy includes nonsteroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants. Treatment of coexisting depression or sleep disorders can also relieve pain.

Tension-type headache is a common diagnosis. Criteria that were established by the International Headache Society, Headache Classification Committee (1988), have recently been updated (Olesen, 2004). Symptoms include mild to moderate bilateral, nonpulsating, pressing, or tightening pain that does not inhibit activity. There is no associated nausea or vomiting and no aggravation of symptoms with routine physical activity. Secondary headache must be excluded to make this diagnosis. Treatment should be multidimensional, including pharmacological and psychological interventions. Although acetaminophen, NSAIDs, or other pain medications may be taken as needed, overuse of analgesics can lead to rebound headaches and cause episodic headaches to become chronic. Prophylactic therapy may be considered as headache frequency increases; some examples include tricyclic antidepressants, valproic acid, topiramate, and propranolol. Some patients benefit from referral to a comprehensive pain-management center with expertise in several areas, including neurology, anesthesia, rehabilitation medicine, psychology, and occupational and physical therapy. These centers may also offer alternative treatments not otherwise available to patients.

Migraine incidence peaks at about age 40 and declines with advancing age; therefore, new onset of migraine is rare in the geriatric population. The suggestion of this diagnosis should prompt an evaluation to rule out secondary causes. Patients with a history of migraine who continue to have headaches through their geriatric years should be treated appropriately. Medications reviewed in the section on tension-type headaches are also used for migraine prophylaxis. Great care should be taken in the geriatric population to be aware of side effects and drug interactions. Most medications should be started at lower doses and increased slowly (Landy & Lobo, 2005).

Trigeminal neuralgia causes severe pain and has an increased incidence in the elderly. It is characterized by paroxysms of high-intensity stabbing pain lasting several seconds, with intervening periods of relief. Usually triggered by any minimal stimulation of the face, episodes of pain usually last 1 to 2 hours and may occur over weeks to months, followed by a long period without painful episodes. The pain may be described as "electric," is unilateral, and is usually in the distribution of the second or third division of the trigeminal nerve (i.e., over the cheekbone and jaw). Carbamazepine has been the first line of treatment in the past. Oxcarbazepine is as effective and has a better side-effect profile. Gabapentin, phenytoin, and baclofen can also be effective. Two newer medications that can be effective are pregabalin and duloxetine. If multiple drug regimens fail, referral for surgery may be considered.

Treatment Principles

Headaches can be treated with medication, but drugs should be only a small part of the overall treatment. A multidisciplinary approach to treatment of primary headache is not only warranted but also preferred in the elderly because of an increased potential for drug interactions and side effects. Alternative treatments such as biofeedback and cognitive-behavioral therapies can be effective (Middaugh & Pawlick, 2002). Situational, social, and psychological triggers should be addressed. Once a secondary headache is ruled out, the patient needs reassurance that there is no serious underlying pathology causing the headache. This alone may provide symptomatic improvement by relieving anxiety, which can exacerbate pain. A "headache diary" can help improve symptoms by giving the patient a sense of control and might identify triggers. All patients should be carefully assessed for common co-morbidities—depression, anxiety, and sleep disorders—that can exacerbate headache symptoms. Appropriate treatment can significantly improve symptoms and potentially obviate the need for analgesics.

Ingested substances that can trigger headache include prescription medications, alcohol, nitrites in hot dogs and processed meats, and monosodium glutamate (e.g., in Chinese food). Carbon monoxide can induce headaches, as can environmental changes (e.g., bright lights; odors; changes in humidity, air pressure, or temperature), hormonal changes, and emotional stress. The patient should be educated about these potential triggers and avoid them if possible. Other triggers may be delayed or missed meals, fatigue, exercise, and sexual activity. Changes in sleep patterns, such as insomnia or excessive sleeping, may contribute to symptoms of pain.

Although headache is a benign condition, it is associated with significant morbidity that is underestimated by the medical community. Sufferers of chronic headache disorders can have a lower level of function than patients with other chronic medical illnesses (Solomon, Skobieranda, & Gragg, 1993). With appropriate treatment, quality of life can improve significantly not only for the patient but also for the family or caregivers.

CARY BUCKNER

Internet Resources

American Council for Headache Education
http://www.achenet.org

Mayo Clinic
http://www.mayoclinic.com/health/headaches/BN00038

National Headache Foundation
http://www.headaches.org

National Institute of Neurological Disorders and Stroke: Headache Information Page
http://www.ninds.nih.gov/disorders/headache/headache.htm

Trigeminal Neuralgia Association
http://www.tna-support.org/

REFERENCES

Cook, N. R., Evans, D. A., Funkenstein, H. H., Scherr, P. A., Ostfeld, A. M., Taylor, J. O., et al. (1989). Correlates of headache in a population-based cohort of elderly. *Archives in Neurology*, *46*(12), 1338–1344.

Gonzalez-Gay, M. A., Barros, S., Lopez-Diaz, M. J., Garcia-Porrua, C., Sanchez-Andrade, A., & Llorca, J. (2005). Giant cell arterities: Disease patterns of clinical presentation in a series of 240 patients. *Medicine (Baltimore)*, *84*(5), 269–276.

International Headache Society, Headache Classification Committee (1988). Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalalgia 8* (Suppl. 7), 1–96.

Landy, S. H., & Lobo, B. L. (2005). Migraine treatment throughout the lifecycle. *Expert Review of Neurotherapeutics*, *5*(3), 343–353.

Lipton, R. B., Pfeffer, D., Newman, L. C., & Solomon, S. (1993). Headaches in the elderly. *Journal of Pain Symptom Management*, *8*, 7–97.

Middaugh, S. J., & Pawlick, K. (2002). Biofeedback and behavioral treatment of persistent pain in the older adult: A review and a study. *Applied Psychophysiology and Biofeedback*, *27*(3), 85–202.

Olesen, J. (2004). Headache Classification Committee of the International Headache Society: The International Classification of Headache Disorders. *Cephalgia*, *24* (Suppl. 1), 1–160.

Solomon, G. D., Skobieranda, F. G., & Gragg, L. A. (1993). Quality of life and well-being of headache patients: Measurement by the medical outcomes study instrument. *Headache*, *33*(7), 351–358.

HEALTH MAINTENANCE

Geriatric medicine strives to promote maximal function and independence for older adults. The unprecedented increase in individuals older than 65 years of age is perhaps the best testament to recent health-promotion and disease-prevention practices.

Primary prevention includes vaccinations, maintaining optimal function (i.e., avoiding sensory deficits, falls and immobility, polypharmacy, depression and substance abuse, urinary incontinence, dementia, elder abuse and neglect), healthy lifestyle (i.e., exercise, nutrition, dental care, nonsmoking, and socialization and social supports), and chemoprophylaxis (i.e., aspirin and vitamins). Secondary prevention includes screening for cancer, cardiovascular disease, hyperlipidemia, hypertension, diabetes, and osteoporosis.

Persons 65 years old are likely to live an additional 15 years and remain independent and active at least until age 75. Because many elders remain active into their 80s and beyond, it seems reasonable to extend the age when we stop screening. Nonetheless, the U.S. Preventive Services Task Force (USPSTF), the Canadian Task Force (CTF) on Periodic Health Examination, and the American Cancer Society (ACS) disagree about what constitutes reasonable, safe, and cost-effective practices for cancer screening. Research clearly suggests that comprehensive health promotion and disease prevention for older adults should include several activities. Interventions should be individualized based on each patient's health profile, life expectancy, health beliefs, and goals for care. Patients should participate in decision making because they must understand any potential costs, follow instructions to prepare for tests, and accept possible false-positive and false-negative results.

Primary Prevention

Health Promotion

Vaccinations. Vaccinations can prevent many infectious diseases. In addition to the standard adult vaccinations, older adults benefit greatly from annual influenza vaccination, pneumococcal pneumonia vaccine (PPV) given once after 65, and tetanus-diphtheria (dT) given every 10 years. The FDA recently approved a herpes zoster vaccine for persons older than 60 years, but CDC ACIP has not published recommendations (CDC/MMWR, 2006).

Maintaining Optimal Function

Certain syndromes limit elders' ability to live life fully; thus, screening for these geriatric syndromes and correcting identified problems can greatly enhance quality of life.

Sensory Deficits. All older adults should be screened for auditory and visual deficits. Visual disturbances resulting from cataracts, glaucoma, or macular degeneration can result in frustration, depression, falls, and loss of independence. Correcting significant hearing or vision losses can restore interest in the world and greatly improve functional status.

Falls and Immobility. Falls are the leading cause of fatal injuries in persons older than 75. Screening for fall risk should include evaluation for sensory deficits, gait and balance abnormalities, neurological or cognitive disorders, and cardiovascular conditions. A thorough assessment of the patient's home environment can identify and correct hazards (American Geriatrics Society, British Geriatrics Society, & American Academy of Orthopaedic Surgeons Panel on Falls Prevention, 2001).

Polypharmacy. Older adults with complex medical conditions typically take several prescription drugs. Drug interactions and adverse drug reactions are common and can be both serious and debilitating. Clinicians should review patients' medications regularly, remove unnecessary medications, and stress adherence for necessary medications.

Depression and Substance Abuse. Depression is especially common among the homebound and isolated elderly and often presents atypically, manifesting as a lack of initiative or somatization. Many older adults are reluctant to reveal feelings of depression and self-medicate with alcohol or other agents.

Urinary Incontinence. Urinary incontinence increases with age and can lead to social isolation, infection, and skin damage. It is often the compelling factor in nursing-home placement. Practitioners should ask about incontinence and evaluate when indicated.

Dementia. All practitioners should evaluate the cognitive function of their older patients. Dementia increases with age, yet early detection allows pharmacological treatment, environmental modifications, and advance planning for end-of life-care, financial matters, and caregiving needs.

Elder Abuse and Neglect. Elder abuse and neglect are often underrecognized and underreported. An older patient's living arrangement, medical co-morbidities, and psychiatric conditions often provide clues about the potential for abuse and neglect (Lachs & Pillemer, 2004).

Healthy Lifestyle

Exercise. Throughout life, exercise benefits strength, mobility, balance, bone density, blood pressure, weight, cognitive function, and socialization. Improving strength and balance can reduce falls among the elderly. Recommended activities include walking, tai chi, swimming, stationary bicycling, gardening, and dancing. Range-of-motion exercises and isometric activities, such as using elastic bands, may prove beneficial for patients with gait instability or physical limitations. Exercises that promote socialization and provide group support may promote better adherence to an exercise program.

Nutrition. Maintaining proper nutrition can be difficult. Shopping and cooking can be burdensome; hence, some elders rely on community-based services for meals. Malnutrition and dehydration are common among the homebound elderly. Poor dentition, swallowing difficulties, loss of taste, medication side effects, and depression can all contribute to poor intake. Weight should be checked at each visit and vitamin supplements considered if patients are unable to eat an adequate, balanced diet. Special attention should be given to calcium and vitamin D intake in both men and women.

Dental Care. A careful annual dental examination should screen for periodontal disease, denture fit (when appropriate) and safety of chewing and swallowing.

Smoking. Smoking has a deleterious effect on the cardiovascular system. When counseled by a physician, about 6% of patients stop smoking. Up to 25% of patients stop smoking when they participate in a support group, have careful follow-up, and pharmacological interventions.

Socialization and Support System. Socialization and support networks are integral components of wellness. Isolated elders have increased incidences of depression, anxiety, and substance abuse. Recent studies suggest that regular social interaction slows cognitive decline and improves overall morbidity and mortality.

Secondary Prevention

Disease Screening

Cardiovascular Disease. Cardiac disease can present atypically in older individuals, particularly in elderly women. Primary care providers should conduct cardiovascular assessments on patients who use tobacco or have hypertension, diabetes, or hyperlipidemia.

Hyperlipidemia. The long-term benefits of reducing cholesterol include fewer cardiovascular events in older individuals who are treated with cholesterol-lowering agents (Miettinen et al., 1997). Current recommendations favor cholesterol screening and treatment in patients with significant coronary-artery-disease risk factors and those with previous coronary-artery or cerebrovascular events. Lowering cholesterol may also lower one's risk of developing Alzheimer's disease and multiinfarct dementia (Evans et al., 2002).

Hypertension. Hypertension is easily screened. When blood pressure readings of older adults were kept below 160/90, the risk of stroke and heart disease declined (up to 30% in some studies). Blood pressure should be monitored regularly and at least annually. Some studies question the usefulness of blood-pressure control after age 80 and raise the question of iatrogenesis from antihypertensive medications.

Diabetes. Diabetes mellitus is a major risk factor for cardiovascular disease and is the sixth leading cause of mortality for Americans older than 75. There are no definitive data on disease-related outcomes with respect to diabetes in the elderly. In all age groups, patients with hyperglycemia or diabetes have increased morbidity and mortality. Strict control of blood glucose levels can reduce the complications associated with diabetes. The risk of hypoglycemic events that can occur with tight control has to be compared with the risk of end-organ damage seen in diabetics with poorly controlled glucose levels.

Osteoporosis. Osteoporotic fractures in older women can be devastating. Hip fractures are associated with significant morbidity and mortality and often lead to institutionalization. Therefore, screening for osteoporosis and assessing risk factors in asymptomatic older adults is extremely important. All postmenopausal women should be screened, be encouraged to get adequate calcium and vitamin D, and engage in weight-bearing exercise. Men older than age 75 are also at risk. Patients should be screened for vitamin D deficiency because it is prevalent among the elderly. Patients who have already sustained fractures and those with osteoporosis should receive additional treatment.

Cancer Screening

The elderly have participated in only a few clinical trials relating to cancer screening; thus, it is difficult to recommend appropriate screening procedures. Walter and Covinsky suggested using a patient's life expectancy, the natural course of the cancer, and the characteristics of the screening tool as a model for reasonable interventions (Walker & Covinsky, 2001). Combining these factors allows for a scientific best-estimate of who would best benefit from screening. The wishes and beliefs of the patient must also be incorporated.

Breast Cancer. Breast cancer increases with age. In 1991, 77% of breast cancer deaths were in women older than 55 years; 31% were in women older than 75. Most clinicians recommend yearly mammograms starting at age 40 until age 65 to 70. However, because the mean life expectancy for a 75-year-old woman is 12 years, screening should probably continue beyond age 70. The American Geriatrics Society (AGS) recommends annual or biennial mammograms until age 75 and then every 2 to 3 years thereafter with no upper limit for women with a life expectancy of 4 years or more. Women who took hormone replacements for more than 7 years have a statistically higher risk for breast cancer and should have yearly mammograms.

Colon Cancer. Colon cancer ranks second among all cancer mortalities and accounts for 54,900 deaths yearly. The American College of Physicians and ACS recommend sigmoidoscopy every 5 years, preferably along with a yearly fecal occult blood test for all patients older than age 50. Alternatives include a double contrast barium enema every 5 years or a colonoscopy every 10 years. Recent data suggest that although the prevalence of colon polyps detected with colonoscopy increases with age, mean extension in life expectancy is much lower in those 80 and older compared to a younger group undergoing screening (Lin et al., 2006). Endoscopic procedures entail some discomfort and risk to older patients, so estimations of life expectancy, ability to undergo surgery if a cancer is detected, and patient preferences need to be carefully considered.

Prostate Cancer. Prostate cancer increases with age. Most prostate cancers progress indolently and do not present clinically. The morbidity and mortality associated with follow-up procedures generated by false-positive results need careful consideration. The U.S. Preventive Services Task Force (USPSTF) does not endorse any of methods for prostate cancer screening, whereas ACS recommends annual digital rectal examinations.

Cervical Cancer. Experts disagree about the usefulness of cervical-cancer screening in elderly women. The USPSTF recommends discontinuing Pap smears at age 65, assuming previously negative results. The AGS recommends a PAP smear at 1- to 3-year intervals until at least age 70. Most experts agree that patients who have not had adequate screening before age 65 should be screened at least once yearly for 2 consecutive years (Mandelblatt & Phillips, 1996).

Other Cancers. Presently, there are no recommendations for routine screenings for lung or ovarian cancer, despite their high mortality. Asymptomatic patients with either strong family histories or environmental risk factors are candidates for more aggressive screening techniques.

Although recommendations for health screening and health promotion are sometimes unclear, practitioners and patients are taking a more active interest in health-promoting behaviors. Good medical care involves listening to patients and tailoring recommendations to each person's individual medical issues and health beliefs.

VERONICA LOFASO

See also

Dementia: Overview
Dentures
Diabetes: Management, Overview
Falls Prevention
Gait Assessment Instruments
Health Promotion Screening
Immunization
Low Vision
Oral Health Assessment
Osteoporosis
Sensory Changes/Loss: Smell and Taste

Internet Resources

Agency for Healthcare Research and Quality
http://www.ahrq.gov/clinic/uspstfix.htm

The American Cancer Society
www.cancer.org

The American Geriatrics Society
www.americangeriatrics.org

The American Heart Association
www.americanheart.org

Centers For Disease Control, Advisory Committee on Immunization Practices
www.cdc.gov/NIP/publications/ACIP-list.htm

Immunization Action Coalition
www.immunize.org/ACIP

MedlinePlus
www.nlm.nih.gov/medlineplus/exerciseforseniors.html

Weill Medical College of Cornell University, Environmental Geriatrics
www.enviromentalgeriatrics.org

REFERENCES

American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention (2001). Guidelines for the Prevention of Falls in Older Persons. *Journal of the American Geriatrics Society*, *49*, 664–662.

Centers for Disease Control, Morbidity and Mortality Weekly Report (CDC/MMWR) (2006). Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (AICP) July 28; 55(RR10), 1–42. Available at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr55e628a1.htm

Evans, R. M., Emsley, C. L., Gao, S., Sahota, A., Hall, K. S., Farlow, M. R., et al. (2002). Serum cholesterol, APOE genotype, and the risk of Alzheimer's disease: A population-based study of African Americans. *Neurology*, *54*, 240.

Lachs, M. S., & Pillemer, K. (2004). *Elder Abuse. Lancet*, *364*(9441), 1263–1272.

Lin, O. S., Kozarek, R. A., Schembre, D. B., Ayub, K., Gluck, M., Drennan, F., et al. (2006). Screening colonoscopy in very elderly patients. *Journal of the American Medical Association*, *295*, 2357–2365.

Mandelblatt, J. S., & Phillips, R. N. (1996). Cervical cancer: How often and why to screen older women. *Geriatrics*, *51*, 45–48.

Miettinen, T. A., Pyörälä, K., Olsson, A. G., Musliner, T. A., Cook, T. J., Faergeman, O., et al., & the Scandinavian Simvastatin Study Group (1997). Cholesterol-lowering therapy in women and elderly patients with myocardial infarction or angina pectoris: Findings from the Scandinavian Simvastatin Survival Study. *Circulation*, *96*, 4211–4218.

Walker, L. C., & Covinsky, K. E. (2001). Cancer screening in elderly patients: A framework for individualized decision making. *Journal of the American Medical Association*, *285*(21), 2750–2756.

HEALTH PROMOTION SCREENING

Health promotion screening covers a broad range of health care services (tasks and tests) designed to prevent or limit disease and disability and maximize independence and quality of life (QOL) in older adults. Screening is only one aspect of health maintenance and promotion; others include vaccinations, prophylactic medications (e.g., aspirin), and a health-promoting lifestyle (e.g., balanced diet and regular physical and mental activity). Evidence of the effectiveness of screening older people is often lacking because older adults are often excluded from clinical trials. Nonetheless, different organizations have guidelines for screening older adults for modifiable risk factors for disease and for the diseases themselves in the early stages.

Depression Screening

Clinical depression is common in older adults, and the suicide rate is twice as high as in the younger population. Depression is associated with increased morbidity and mortality from other physical illnesses, such as cardiovascular disease. Once depression in an older adult is identified, treatment can reduce the associated morbidity. In clinical trials, treatment of depression led to better levels of physical functioning. Screening for depression is estimated to cost $32,000 per quality-adjusted life-year (QALY) saved for one-time screening and $192,000 for annual screening.

Alcoholism Screening

Although moderate levels of alcohol consumption have been associated with improved cardiovascular outcomes, heavy drinking by older adults is associated with increased disability and even mortality. Alcohol counseling can reduce heavy drinking and may prevent the associated harm. In clinical trials, counseling (15 minutes) and follow up led to 13% to 34% reduction in the amount of drinking that was maintained in a follow up 4 years later.

The U.S. Preventive Services Task Force (USPSTF, 2005) recommends screening for alcoholism; however, screening effectiveness in reducing the deleterious effects of heavy drinking has not been established.

Screening for Falls

Of the 250,000 hip fractures every year in the United States, almost all occur when an elderly person falls during regular activities. About half of older hip-fracture patients do not regain their prior level of physical functioning and lose independence. New interventions such as the use of hip protectors have proven effective in reducing hip fractures in older adults at risk for falls. A meta-analysis demonstrated that multifactorial interventions (including home-safety evaluation and physical therapy) reduce falls by 12 per 100 adults per month. The American Geriatrics Society (AGS) recommends screening older adults annually for fall risk.

Other Screening Questions

The USPSTF recommends asking about claudication (i.e., pain in calf muscles with walking), a symptom of peripheral atherosclerotic occlusive disease that is also a marker for increased risk for heart attacks and strokes and would trigger more aggressive use of aspirin and cholesterol-lowering drugs (i.e., statins). Both the USPSTF and the American College of Physicians (ACP) recommend screening for new difficulties with mobility and activities of daily living (ADL) and unintentional weight loss of 5% or 20 pounds or more in 6 months.

Screening for Sensory Deficits and Early Sensory Changes

Hearing loss affects 40% of adults 65 years or older and 80% of those 85 years and older. Hearing loss leads to social isolation, depression, and reduced QOL and has been associated with falls, cognitive decline, physical decline, and increased mortality. Easy and effective screening tests are available: the whisper-voice test has sensitivity of 94%. Hearing aids can improve hearing and normalize QOL and mortality risk.

About 16% of 75- to 84-year-olds and 27% of those 85 years and older are unable to read newsprint, even with correcting glasses. In one study, up to one-third of geriatric clinic patients had undiagnosed yet correctable loss of vision. In another study, older adults with cataracts were at 2.5-times increased risk for motor-vehicle accidents. Vision loss is also a risk factor for hip fractures and is associated with faster physical decline and greater mortality. Screening for (and correcting) vision loss may prevent these effects. The USPSTF recommends annual vision screening with a Snellen chart.

Glaucoma is the leading cause of blindness in elderly African Americans, affecting 11% of those 80 years or older. Glaucoma can be prevented by lowering intra-ocular pressure (IOP) in those who have raised pressure: The Ocular Hypertension Treatment Study established that treatment of increased IOP can reduce the incidence of glaucoma by half (i.e., from 9.5% over 5 years to 4.4%) (Kass et al., 2002). The USPSTF recommends IOP screening all older adults and the American Academy of Ophthalmology recommends screening every 2 years.

Age-related macular degeneration (ARMD) is the leading cause of blindness in elderly White Americans. About one-quarter of those 75 years or older have early ARMD. Early laser photocoagulation in such individuals improves visual outcomes (Wormald, Evans, Smeeth, & Henshaw, 2005). The cost of laser therapy per QALY gained is only $5,600.

Blood Pressure Screening

Hypertension (high blood pressure) increases with age, and one in two adults 70 years or older has high blood pressure. Blood-pressure treatment strives to prevent heart attack, strokes, and heart failure. Several studies report that healthy older adults with hypertension can be treated with modest doses of blood-pressure medications that substantially decrease strokes and stroke-related mortality, coronary artery disease mortality, and mortality overall. The cost of treatment in women 70 years and older is $1,300 for every year of life gained. The efficacy of treatment is even greater in those 80 years and older. Unfortunately, many patients are not treated because of failure to identify hypertension and institute treatment. The USPSTF and the ACP recommend screening every 2 years and with every clinic visit.

Other Screening Examinations

The USPSTF recommends annual monitoring of height and weight to screen for silent vertebral fractures and unintentional weight loss, full skin examination in those with previous history of skin cancer or extensive skin damage from sun exposure, an oral examination in smokers and alcoholics, and a thyroid examination in those with history of exposure to radiation.

Blood Glucose Screening

Diabetes mellitus is present in 1 of every 10 adults 65 years of age or older, and 1 of 4 adults 85 years or older. Diabetes is a major risk factor for heart attacks and strokes and is responsible for substantial morbidity and increased mortality in older adults. The fasting blood glucose level is the main test for the screening and diagnosis of diabetes, with a value of 126 mg/dL or greater meeting the criterion for diabetes. Levels between 100 and 125 mg/dL indicate a prediabetic stage, with increased risk for developing overt diabetes. Clinical trial data suggest (albeit in younger adults) that early interventions in those at increased risk for diabetes can prevent its onset: In a trial in adults with impaired glucose tolerance, the 3-year incidence of overt diabetes was reduced by a diet and exercise-counseling program from 23% to 7%.

Early and aggressive treatment to control blood glucose levels reduces the long-term complications of diabetes—retinopathy, nephropathy, neuropathy, cardiovascular disease, and peripheral vascular disease. The USPSTF recommends screening all obese adults because obesity, especially abdominal obesity—waist girth greater than 40 inches in men and 36 inches in women—is a risk factor for diabetes; those from high-risk ethnic groups (i.e., African Americans, Native Americans, and Hispanic Americans); and those with other risk factors for cardiovascular disease (i.e., hypertension and/or hyperlipidemia).

Serum Cholesterol Screening

Several observational studies have found that high levels of serum cholesterol are associated with increased risk for cardiovascular events (e.g., heart attacks, strokes, and peripheral arterial occlusions). Analysis of data from elderly subgroups in clinical trials shows that treatment with statins (i.e., the most effective class of cholesterol-lowering drugs) significantly reduces this risk.

Hypercholesterolemia screening is indicated in people with evidence of coronary artery disease (e.g., previous heart attack, coronary bypass or angioplasty, or known angina pectoris), other atherosclerotic vascular disease (e.g., stroke, transient brain ischemia, or leg claudication [pain in calf muscles with walking]), or diabetes mellitus. All three groups of adults need to keep their low-density-lipoprotein (LDL) cholesterol levels below 100 mg/dL, and statins should be instituted if LDL levels are above 100 mg/dL (Grundy et al., 2004; National Cholesterol Education Program Adult Treatment Panel III 2001). There is no upper age cutoff for cholesterol screening and treatment with statins for these individuals. In some very high-risk individuals (e.g., those with a recent cardiovascular event and diabetics or smokers with known cardiovascular disease) the target LDL cholesterol level is even lower: 70 mg/dL (National Cholesterol Education Program Adult Treatment Panel III 2001, update 2004).

In older adults who do not fall into one of the three high-risk groups defined previously, evidence is not as strong for the screening and treatment of elevated cholesterol levels. Based primarily on evidence from clinical trials in younger adults, the National Cholesterol Education Program (NCEP) recommends cholesterol screening and treatment (if indicated) to bring LDL levels below 100 mg/dL in all older adults who smoke, have metabolic syndrome, or have serum C-reactive protein (CRP) levels more than 3 mg/dL. The target LDL level is 130 mg/dL in older adults with either hypertension or low levels of high-density-lipoprotein (HDL) cholesterol (i.e., below 40 mg/dL).

There is insufficient evidence for benefit from screening and treating older men who have no cardiovascular risk factors, and the evidence indicates that there is no benefit from treatment with statins in older women (Walsh, 2004). Both the USPSTF and the ACP do not recommend screening for primary prevention in men and women 75 years of age and older who have no risk factors for cardiovascular disease.

Urine Screening Tests

Neither the ACP nor the USPSTF recommends routine urinalysis screening in asymptomatic older adults. However, it can be cost-effective to screen older adults for microalbuminuria and treat those with a urine albumin-to-creatinine ratio greater than 30 with a kidney-protective agent (e.g., an ACE-inhibitor or an angiotensin receptor blocker). Everyone with diabetes mellitus should be screened annually and treated. In addition, it appears cost-effective to annually screen and treat all older adults irrespective of their diabetes status; the cost of such a screening and treatment practice in adults 60 years and older with hypertension is $19,000 per QALY saved and $54,000 per QALY saved in 60-plus-year-old adults without either hypertension or diabetes mellitus (Boulware, Jarr, Tarver-Carr, Brancati & Powe, 2003).

Aortic Aneurysm Screening

There are 15,000 deaths related to abdominal aortic aneurysms (AAA) every year in the United States. About 1% of adults 60 years of age and older have an AAA 5cm or larger. In a United Kingdom clinical trial of ultrasound imaging to screen for AAA in asymptomatic individuals 65 years and older, screening prevented AAA-related deaths in men but not in women. The USPSTF recommends one-time screening of male smokers 65 to 75 years of age.

Bone Density Screening

The lifetime risk of an osteoporotic fracture in American women is 50%. Bone-mineral density in the femoral neck is an excellent predictor of hip-fracture risk, and treatment of high-risk women with bisphosphonates reduces their risk for hip fractures. The USPSTF recommends screening every woman older than 65 years of age.

Screening Mammograms

In the United States, 45% of new breast cancer cases and 56% of breast cancer deaths occur in women 65 years and older. Clinical trial data showed that in 50- to 74-year-old women, screening mammograms reduces breast cancer deaths by 25% and overall mortality by 2%; there was no difference between annual and biennial (i.e., every 2 years) screening strategies with respect to benefits. However, screening is not without harm: 1 in 10 mammograms gives a false positive and after 10 screening mammograms, there is a 50% chance of a false-positive finding and an 18% chance of an unnecessary biopsy with the accompanying anxiety about cancer. Recently, there has been controversy about whether the benefits from regular screening mammograms really exceed the harm. The USPSTF recommends biennial screening mammograms in older women until remaining life expectancy is 6 years or less.

Colon Screening

The lifetime risk of colon cancer is 5%, and 94% of new cases are in adults aged 65 years and older.

Colon cancer is the second leading cause of cancer deaths and is responsible for 60,000 deaths every year in the United States. The USPSTF recommends colon-cancer screening in all older adults using one of three strategies: (1) annual occult blood testing on six stool specimens from three different days, followed by colonoscopy on those testing positive; (2) flexible sigmoid examination of the distal colon every 5 years; or (3) colonoscopy every 10 years. The Agency for Healthcare Research and Quality (AHRQ) recommends discontinuing the screening when life expectancy is less than 10 years. A single fecal blood test during a routine clinic visit is inadequate; its sensitivity is less than 5% (Collins, Lieberman, Durbin, & Weiss, 2005).

Screening Tests of the Future

Several new laboratory and imaging tests have potential as good screening tests but have not yet been perfected or adequately evaluated for screening effectiveness and cost. Among them are coronary calcium measurements by high-resolution imaging (as a screen for coronary artery disease), helical computer tomography for screening smokers for lung cancer, virtual colonoscopy for colon-cancer screening, magnetic resonance mammography, and positron emission tomographic imaging of the brain to screen for Alzheimer's disease.

Despite the availability of national screening guidelines, health care providers must individualize the use of screening tasks and tests based on the older patient's existing medical conditions, belief and value system, and personal preferences.

Arun S. Karlamangla
James W. Davis

See also

Gait Assessment Instruments

Health Maintenance

Multidimensional Functional Assessment: Instruments

Multidimensional Functional Assessment: Overview

Quality-of-Life Assessment

Internet Resources

Agency for Health Care Research and Quality
http://www.ahcpr.gov/clinic/uspstfix.htm

American Geriatrics Society
http://www.americangeriatrics.org/education/cp_index.shtml

American Heart Association
http://www.americanheart.org

American Medical Association
http://www.ama-assn.org/ama/pub/category/6886.html

Canadian Task Force on Preventive Health Care
http://www.ctfphc.org/

Centers for Disease Control and Prevention
http://www.cdc.gov/node.do/id/0900f3ec80059b1a

National Heart, Lung, and Blood Institute
http://www.nhlbi.nih.gov

National Institute of Diabetes and Digestive and Kidney Diseases http://www.niddk.nih.gov

REFERENCES

Boulware, L. E., Jaar, B. G., Tarver-Carr, M. E., Brancati, F. L., & Powe, N. R. (2003). Screening for proteinuria in U.S. adults: A cost-effectiveness analysis. *Journal of the American Medical Association*, *290* (23), 3101–3114.

Collins, J. F., Lieberman, D. A., Durbin, T. E., & Weiss, D. G. (2005). Veterans Affairs Cooperative Study #380 Group. Accuracy of screening for fecal occult blood on a single stool sample obtained by digital rectal examination: A comparison with recommended sampling practice. *Annals of Internal Medicine*, *142*(2), 81–85.

Grundy, S. M., Cleeman, J. I., Bairey Merz, C. N., Brewer, H. B., Jr., Clark, L. T., et al. for the Coordinating Committee of the National Cholesterol Education Program (2004). Implications of recent clinical trials for the National Cholesterol Education Program Adult Treatment Panel III Guidelines. *Circulation*, *110*, 227–239.

Kass, M. A., Heuer, D. K., Higginbotham, E. J., Johnson, C. A., Keltner, J. L., Miller, J. P., et al. (2002). The Ocular Hypertension Treatment Study: A randomized trial determines that topical ocular hypotensive medication delays or prevents the onset of primary open-angle glaucoma. *Archives of Ophthalmology*, *120*(6), 701–713.

National Cholesterol Education Program Adult Treatment Panel III (2001). Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III). *Journal of the American Medical Association*, *285*, 2486–2497.

U.S. Preventive Services Task Force (2005). The guide to clinical preventive services 2005. Agency for Health Care Research and Quality. Publication # 05-0570/. Available at http://www.ahrq.gov/clinic/pocketgd05/

Walsh, J. M., & Pignone, M. (2004). Drug treatment of hyperlipidemia in women. *Journal of the American Medical Association*, *291*(18), 2243–2252.

Wormald, R., Evans, J., Smeeth, L., & Henshaw, K. (2005). Photodynamic therapy for neovascular age-related macular degeneration. *Cochrane Database of Systematic Reviews*, 4, CD002030.

HEARING AIDS

Hearing aids are the most common nonmedical treatment for sensorineural hearing loss. Factors in hearing-aid selection include the type and amount of hearing loss, the patient's willingness to try a hearing aid and work through the adjustment period, ability to adapt to change, lifestyle, family support, and manual dexterity.

Young, middle-aged, and independent older people who complain of hearing difficulties that interfere with work and social interactions are typically highly motivated to improve their hearing and are excellent hearing-aid candidates. Elders who are partially or totally dependent on others for daily care are less likely to be successful long-term users.

It is important to explain and discuss realistic expectations with the patient. One common misconception is that a hearing aid restores normal hearing just as eyeglasses restore normal vision. In general, an aid improves hearing by approximately 50%. The goal is not to restore normal hearing but to improve communicative ability and quality of life.

There are five main types of hearing aids and, despite differences in size and style, all have the same basic components: microphone, amplifier, receiver, and power supply. Regardless of design, they all transform sound to an electrical signal, which is processed and transformed into a sound wave after amplification. Previously, amplification used an analogue signal; however, the current generation of hearing aids uses digitalized information. The receiver takes the electrical energy and converts it back to sound waves that are delivered to the ear canal through the hearing-aid shell. A battery supplies the power that runs the hearing aid.

Behind-the-Ear (BTE) Hearing Aid

The BTE hearing aid fits behind the ear and is connected by a small plastic tube to a soft, custom-made plastic ear mold that fits inside the outer ear. The battery, amplifier, and receiver are all inside the case that fits behind the ear. The microphone is located at the top of the hearing aid near the ear hook. The ear hook curves around the top of the ear and attaches to a small piece of plastic tubing extending from the ear mold. Sound travels through the ear mold into the ear. This type of hearing aid is suitable for patients with severe hearing loss and for those with poor dexterity. Historically, it was the hearing aid of choice. The advantage of a BTE device is that it is suitable for all ages and for any degree of hearing loss, from mild to profound. The microphone is at ear level, which simulates natural sound reception. Disadvantages of a BTE device are that it is bothersome for eyeglass wearers, and a poorly fitting ear mold may cause acoustic feedback. To prevent this, the ear mold may need to be remade periodically to ensure a good acoustic seal.

Several years ago, a new, miniature BTE hearing aid was designed. The aid is essentially invisible, leaves the ear canal open, and can be fit in less than 30 minutes without an ear impression. Several manufacturers have marketed BTE hearing aids with built-in FM receivers.

In-the-Ear (ITE) Hearing Aid

In this one-piece hearing aid, the microphone, receiver, and amplifier all fit completely in the outer ear. Each aid is custom-made from hard plastic. The ITE is suitable for patients with mild to severe hearing loss. Many patients prefer this model because it is easy to handle and fits comfortably. The ITE is also cosmetically appealing due to its smaller size, and microphone placement simulates natural sound reception. However, the small size makes the volume control and battery door difficult to use. Ear wax may damage the device, and there is an increased chance of feedback due to the proximity of the microphone and receiver. Acoustic feedback, such as whistling, occurs when the microphone is close to a loudspeaker. There are two types of acoustic feedback. One is produced internally from the hearing aid and indicates that the device needs repair; the second is external feedback produced by leakage of amplified sound out of the ear canal and back into the microphone. Feedback that occurs when the hearing aid is being inserted or removed is common and does not necessarily signal the need for action. BTE hearing aids have a clear advantage over the smaller ITE or in-the-canal (ITC) aids, because feedback is less likely to occur. ITE digital and analogue programmable rechargeable hearing aids free people with dexterity difficulties from the need to change batteries. The rechargeable battery lasts up to 5 years.

In-the-Canal (ITC) Hearing Aid

This custom-made aid is smaller than the ITE and fits into the auditory canal. Because the microphone is closer to the tympanic membrane, the signal has a shorter distance to travel and provides a clearer, more natural amplified sound. As with the ITE, the advantages of the ITC are simulation of natural sound reception and small size; disadvantages are increased chance of feedback and difficulty operating the battery door and volume control. The device is easily damaged by ear wax or ear drainage. Therefore, an ITC is not suitable for people with chronic ear conditions such as impacted cerumen. Laser scanning and 3D printing technology allows manufacturing of custom hearing-aid shells that have a more accurate fit, more even thickness, less feedback, better comfort, and higher durability. If the hearing aid needs to be remade, the audiologist can order the hearing aid without the user making an office visit. Newer modular hearing aids include a compact module of preassembled electronic components. Shells made for modular hearing aids have part of the faceplate with a hole to accommodate the compact module. If a hearing aid malfunctions, the compact module can be replaced in the audiologist's office.

Completely in the Canal (CIC) Hearing Aid

The CIC is the smallest hearing aid, and it is essentially hidden in the canal. It is suitable for patients with mild to moderate hearing loss. It is cosmetically appealing and provides the best natural sound. Conventional user-operated volume control is replaced by options such as magnet control and remote control; a removal string attached to the CIC assists with extraction. Reduction in the occlusion effect (i.e., the phenomenon that causes the hearing-aid user's own voice to sound loud (with an annoying echo-like quality) is also a significant advantage. There are several notable disadvantages to the CIC. It has a short battery life (i.e., 10 to 14 days), requires good manual dexterity, and has the highest incidence of feedback. Hearing aids such as the ITC and CIC do not cause infection but are contraindicated in patients with chronic ear conditions, aural drainage, dermatological infections, cholesteatoma, and otitis media.

Body-Style Hearing Aid

The body-style hearing aid has a microphone that is worn in a chest harness or pocket or attached to a belt. A wire connects the aid to a receiver on the ear mold, which fits inside the ear. People with difficulty keeping a hearing aid on the ear or who cannot manipulate small controls may benefit from this style hearing aid. Individuals with profound hearing loss who require powerful amplification generally must use this style. The disadvantages of the body-style hearing aid are that it is cumbersome due to its size and wires and is not cosmetically appealing. If it is worn under clothing, clothes rubbing against the microphone can cause noise. If it is worn on the chest, the microphone and controls may be damaged by food or liquid spills.

Hearing-Aid Circuits

Advances in hearing-aid technology are occurring rapidly. Programmable computer circuits can individualize devices so that certain frequencies can be selectively amplified to closely match a person's hearing loss. Three basic types of electronics are used in hearing aids.

Analog/Adjustable

An analog circuit converts sound (i.e., pressure waves) into a voltage waveform. After amplification and filtering, electrical signals are reconverted to sound by a receiver. An audiologist determines the specifications for the aid, which is then built by a laboratory. The audiologist can make limited adjustments via small screws on the aid. This type of aid is the least complex and the most affordable option.

Analog/Programmable

Although still utilizing analog technology, the programmable aids have additional circuitry that enables digital adjustments via a computer. Some have remote controls that allow the wearer to change the program according to the particular listening environment.

Digital/Programmable

Digital hearing aids use computer microchips to process sound digitally, which produces high-quality sound. Adjustments can be made with a computer, allowing the audiologist to individualize the aids, which are typically the most sophisticated and expensive option.

Advanced-technology hearing-aid circuitries employ recent scientific developments in amplification electronics, known as nonlinear or compression amplification. The result is a hearing aid that can limit the level of incoming sound volume. This delivers a more natural loudness throughout the entire listening range, and sounds do not get too loud or too quiet, as can occur with traditional hearing aids. Individuals with mild to moderately severe hearing loss, those with a high-frequency loss, and those with reduced tolerance to sound derive great benefit from these circuits. Noise-reduction circuits took a major leap forward with the reintroduction and perfection of hearing aids incorporating directional microphones. With such an aid, the degree of amplification is reduced for sound signals arriving from any other angle except directly in front. Those sounds arriving from a frontal direction are given full amplification, whereas all others are suppressed somewhat.

Some hearing aids can be programmed to allow several settings in the same hearing aid to adjust for changes in environmental noise. For example, there might be a program for quiet conversation or music and another for noisy situations when communication is difficult.

The wide variety of choices for hearing aid also means a wide range of prices—from $500 to $3,000. Medicare pays for audiology evaluations, but hearing aids are not covered. In many states, Medicaid pays for hearing aids. Some states require that consumers receive a free 30-day trial period to evaluate a hearing aid. Health insurance usually does not cover the cost of hearing aids; however, some plans may reimburse 5% to 10% of the cost.

In sum, hearing devices have evolved into sophisticated individualized hearing computers. With the continued shrinking of computer chips, increased processing speed, and reduced power consumption, digital hearing aids with more automatic and sophisticated options will become available.

Recent advances in hearing aids are taking advantage of cutting edge technologies. The first open-platform digital hearing aid, ReSound 5000, was launched in 1998, and several manufacturers shared the platform. "Open platform" means that the manufacturers or clinicians can choose the software to be downloaded into the hearing aid. In 2004, GNReSound launched the second generation of open-platform digital hearing aids, Canta Open. The signal-processing algorithm is changed by simply choosing the name of the fitting algorithm in the fitting software.

Siemens has recently launched Acuris, the first generation of binaural hearing aids. Programmable and digital hearing aids are conventionally programmed by using computers. A new Noahlink programming interface using the Bluetooth® wireless technology became available in January 2003. The NoahLink is a portable device that can be worn in front of the hearing-aid user. It provides a wireless two-way communication between the computer and the hearing aid. These newer technologies are ensuring that most hearing-impaired individuals will be helped with a hearing aid that can provide a better quality of life.

MILLA KAREV

See also
Hearing Impairment

Internet Resource
American Academy of Audiology
http://www.Audiology.org

HEARING IMPAIRMENT

Hearing impairment is one of the most common chronic health conditions affecting older adults. Among noninstitutionalized elderly, hearing loss is the third most common condition after hypertension and arthritis. Approximately one-third of the U.S. population older than the age of 65 has some degree of hearing loss. In nursing homes, 70% of residents have significant hearing loss (Warshaw & Moqeet, 1998). However, despite its prevalence, hearing impairment and its impact on quality of life often go unnoticed. Hearing impairment has been associated with social isolation, depression, and decreased cognitive functioning in the elderly.

Hearing depends on the complete function of the auditory pathway, from the external auditory canal to the central nervous system. The peripheral hearing apparatus—external ear, middle ear, inner ear, and eighth cranial nerve—comprises the conductive and sensorineural components of hearing. The external ear, containing the auricular concha and external auditory canal, directs sound medially to the tympanic membrane. When sound waves reach the tympanic membrane, the vibration sets into motion the three middle-ear ossicles: the malleus, incus, and stapes. The middle ear acts as an impedance-matching mechanism and transmits acoustic energy from the air to the fluid of the inner ear, where the cochlea converts the sound from mechanical to electrical energy. This electrical energy, or nerve impulse, is transmitted via the eighth cranial nerve to the brain stem and central nervous system (Shohet & Bent, 1998).

There are several age-related physiological changes within the hearing apparatus. The external auditory canal is affected by atrophy of the cerumen glands, resulting in drier cerumen and increased risk of impaction in the elderly. Tympanosclerosis, or atrophic and sclerotic changes of the tympanic membrane caused by previous middle-ear infections, are common. The effects of these changes are generally negligible with respect to hearing per se. Otosclerosis, fixation of the stapes footplate to the oval window, causes conductive hearing loss in up to 10% of the elderly population, but its hearing-loss effects are usually present from earlier in life. Aging changes that may occur in the inner ear include atrophy of the basal end of the cochlea (the area responsible for high-frequency sounds), loss of hair cells, and loss of neurons in the auditory centers of the cortex and brain stem (Warshaw & Moqeet, 1998).

Types of Hearing Loss

There are four types of hearing loss: conductive, sensorineural, mixed, and central auditory processing disorder (CAPD). *Conductive hearing loss* is an impairment in the mechanical mechanisms of the outer and middle ear by which sound reaches the inner ear. It is characterized by disorders that impede normal transmission of sound waves though the external canal, tympanic membrane, or middle ear. Thus, there is a reduction in air-conducted but not in bone-conducted sounds. Conditions that frequently result in conductive hearing loss include impacted cerumen, tympanic membrane perforation, otitis media, and discontinuity or fixation of the middle-ear ossicles (e.g., otosclerosis, Paget's Disease) (Shohet & Bent, 1998).

Sensorineural hearing loss occurs when the cochlea or auditory nerve pathway is not functioning properly. It is characterized by equal reduction in air and bone conduction. This type of hearing loss can be either congenital or acquired. The cochlea is the most common site of damage secondary to hair-cell damage or ganglion-cell loss (Shohet & Bent, 1998).

The most common cause of sensorineural hearing loss in the aged is presbycusis, which affects one-third of the population older than 75 years of age. Presbycusis is an insidious hearing loss that initially is most pronounced at higher frequencies. Some few patients exhibit a flat configuration with loss of hearing sensitivity essentially equal at all frequencies across the audiometric range (250-8,000 hertz [Hz]). High-frequency hearing loss affects the ability to recognize or discriminate speech sounds especially in environments with background noise. Persons with presbycusis usually know when they are being spoken to but they may not always understand what is said because they can hear the low-frequency-centered and more acoustically powerful vowels but find distinctions among higher-frequency consonant sounds such as *f*, *s*, *th*, *h*, and *sh* difficult. The cause of presbycusis remains unclear. Studies have attempted to link the effects of metabolism, arteriosclerosis, smoking, noise exposure, genetics, diet, and stress. Presbycusis remains a diagnosis of exclusion; other causes of bilateral, progressive sensorineural hearing loss must be ruled out before the diagnosis can be made (Warshaw & Moqeet, 1998).

Mixed hearing loss is the combination of conductive and sensorineural hearing loss. Air and bone conduction are both reduced, but loss of air conduction is greater.

A *central auditory processing disorder* is a deterioration of auditory perceptual abilities that is generally associated with the aging process, which is separate from the loss of hearing sensitivity associated with changes in the peripheral auditory mechanism, particularly the cochlea. An example of CAPD is the reduced ability to understand speech in the presence of background noise or the inability to understand distorted or rapid speech. A CAPD is often mistaken for cognitive decline.

Diagnosis of Hearing Loss

The first step in identifying hearing loss is obtaining information about the onset of the hearing loss. Whether the onset was unilateral, bilateral, fluctuating, progressive, sudden, or insidious is important. A complaint of adult-onset unilateral hearing loss at any age raises suspicion of a seventh cranial nerve neoplasm, whereas symmetrical, bilateral hearing loss of gradual onset in persons older than the age of 60 is associated with presbycusis. Meniere's disease is associated with tinnitus, episodic vertigo, and fluctuating, then progressive, hearing loss.

It is necessary to inquire about predisposing factors such as head trauma, exposure to noise, involvement of a neoplastic process, or family history of hearing loss. Medications must be carefully reviewed because commonly used drugs such as the aminoglycoside antibiotics, loop diuretics, salicylates, antineoplastic agents (e.g., cisplatin, oral or parenteral erythromycin, and many other medications have ototoxic properties. (Complaints similar to those encountered in presbycusic patients may accompany hearing loss secondary to excessive noise exposure and may play a significant role in an individual's total hearing loss along with the aging factors.) On physical examination, any disfigurement of the ear architecture, including the auricle and external auditory canal, should be noted. The tympanic membrane should be closely observed for foreign body, impacted cerumen, perforation, tympanosclerosis, effusion, or infection. A complete head and neck, cranial nerve, and, if indicated, neurological examination should be performed.

Screening techniques include simple tuning-fork tests, such as the Rinne and Weber tests, but provide qualitative rather than quantitative data. The Rinne test is performed by placing the stem of a vibrating tuning fork on the mastoid process (i.e., bone conduction) and then suspending the fork adjacent to the ear canal (i.e., air conduction). The patient is asked to determine in which position the sound is louder. Normally, air conduction is greater than bone conduction, so the sound would be louder with the tuning fork placed in front of the ear. The Weber test is performed by placing a vibrating tuning fork on the midline of the forehead and asking the patient which ear perceives the sound. In conductive hearing loss, the sound is louder in the affected ear; in sensorineural hearing loss, the sound is louder in the unaffected ear (Shohet & Bent, 1998).

There is an increasing use of audiometric devices such as the audioscope (i.e., a portable handheld audiometer combined with an otoscope), which also can be used as a screening tool. The instrument's speculum is placed in the external auditory canal, forming a tight seal. A sequence of tones is produced by pushing a button on the device; the patient indicates whether a tone was heard. If hearing impairment is suspected after an office-based screening, referral to an audiologist for formal assessment is recommended. Loss of hearing sensitivity is measured in units of sound known as decibels (dB). The greater the intensity of sound (in dBs) required for a person to hear, the poorer the hearing. Puretone thresholds better than 25 dB in the speech frequencies of 500, 1,000, and 2,000 Hz (cycles per second) are satisfactory for routine listening needs, whereas significant sensitivity loss at 3,000 Hz and above may suggest the need for intervention with presthetic amplification. Amplification may also be indicated, however, if psychosocial or work-related factors demand better hearing.

Pure tone audiograms reflect the type of hearing loss (i.e., sensorineural, conductive, or mixed), magnitude of the loss and the unilateral or bilateral nature of the loss (i.e., including symmetry), and at what frequencies the loss occurs. Speech sound discrimination or recognition, tested for each ear, identifies the degree to which a person understands spoken words (i.e., word intelligibility), in quiet, and possibly in noise.

A tympanogram, often part of the routine audiological test, provides a measure of tympanic membrane mobility and assesses middle-ear pressure. This analysis can assist in the diagnosis of tympanic membrane perforation, effusion, ossicular fixation, ossicular discontinunity, and other causes of conductive hearing loss. Measurement of the auditory-evoked brain-stem response, especially with new enhancements such as auditory steady state response (A.S.S.R)., is useful in older patients who may be unable to respond appropriately to classical testing techniques. These electrophysiological test requires only that the patient be cooperative and quiet during the procedure.

Computed tomography (CT) without contrast and magnetic resonance imaging (MRI) with gadolinium contrast are the radiological tests of choice for assessing the integrity of the auditory pathways. CT is particularly useful for identifying bony lesions of the temporal bone and mastoid process. MRI is the "gold standard" in the diagnosis of retrocochlear lesions such as acoustic Schwannomas and is often used when results of the auditory brain-stem response are abnormal. When a patient complains of sudden or unilateral hearing loss, a draining ear, or signs of conductive hearing loss; is vertiginous; or has a significant reduction in hearing loss and/or speech discrimination, referral to an otolaryngologist is strongly recommended.

Management of Hearing Loss

A simple procedure such as cerumen extraction may be all that is needed to restore adequate hearing. Antibiotic therapy can be used in infectious processes such as tertiary syphilis and otitis media. Corticosteroids can be used to treat immune-related or viral hearing loss. Surgical procedures are quite successful in most conductive hearing losses and in the removal of acoustic neuromas.

A hearing aid should be considered after a complete otological and audiological evaluation has confirmed medically untreatable hearing loss. Hearing aids are the most common treatment option for patients with sensorineural hearing loss. The success of auditory rehabilitation depends on a person's auditory and physical capabilities, including manual dexterity and mobility, level of social activity, motivation, and adaptability.

Although hearing aids play an integral part in hearing rehabilitation, other interventions, including speech-reading training, listening training, and lip-reading instruction, play a role in helping a majority of the elderly overcome their auditory difficulties. Many hearing-impaired individuals require assistive listening devices in certain surroundings. For example, inexpensive amplifiers are available for use with the television or telephone. Infrared devices are particularly effective adjuncts when attending theater, motion pictures, and lectures or when viewing television. Other services include closed-captioned entertainment, vibrating alarm clocks, fire alarms that flash or vibrate the bed, accessory headsets for television or radio, and telephone- and doorbell-signaling devices.

Marc Kramer

See also
Hearing Aids

Internet Resources
American Academy of Audiology
http://www.audiology.org

American Academy of Otolaryngology—Head and Neck Surgery
http://www.entnet.org/patient

American Speech-Language-Hearing Association
http://www.asha.org

American Tinnitus Association
http://www.tinnitus.org

Self-Help for Hard-of-Hearing People
http://www.shhh.org

REFERENCES

Shohet, J. A., & Bent, T. (1998). Hearing loss: The invisible disability. *Postgraduate Medicine*, *104*(3), 81–90.

Warshaw, G., & Moqeet, S. (1998). Hearing impairment. In T. T. Yoshikawa, E. L. Cobbs, & K. Brummel-Smith (Eds.), *Practical Ambulatory Geriatrics* (2nd ed., Vol. 16, pp. 118–125). St. Louis, MO: Mosby Year-Book.

HEART FAILURE MANAGEMENT

See
Chronic Heart Failure in the Elderly

HEARTBURN

Heartburn is a common symptom of gastroesophageal reflux disease (GERD) in the elderly. Patients with GERD exhibit typical symptoms such as heartburn, regurgitation, belching, sour taste in the mouth, and upper abdominal discomfort. Other patients experience atypical manifestations such as chest pain, asthma, cough, hoarseness, laryngitis, globus (i.e., a sensation of a lump in the throat), and recurrent pneumonia. Complications in the form of esophageal stricture or cancer may develop.

Although the elderly may have fewer symptoms of GERD compared to younger patients, they may have more mucosal damage. Older symptomatic patients tend to have longer reflux episodes, with males refluxing more than females (Ter, Johnston, & Castell, 1998). In addition, they have a higher prevalence of smoking, medication use, and other medical conditions that would increase their risk for GERD.

The causes of GERD include (1) decreased esophageal clearance due to decreased peristalsis or saliva, (2) a dysfunctional lower esophageal sphincter (LES) that fails to prevent reflux of gastric contents, (3) delayed gastric emptying, (4) hiatal hernia, and (5) gastric-acid hypersecretion. Medications used by the elderly, such as beta antagonists and nitrates, may also decrease LES pressure, thereby promoting reflux.

Noncardiac chest pain is a common atypical manifestation of GERD. Approximately 50% of patients who have chest pain and normal cardiac angiography are shown to have GERD by 24-hour esophageal pH monitoring. It can be difficult to differentiate GERD from heart disease based on clinical symptoms alone. In some patients, exertion may even exacerbate GERD-related chest pain (Schofield et al., 1987).

Diagnosis

Testing to diagnose GERD is indicated if there are persistent or chronic symptoms. There are a variety of tests for GERD, each having certain advantages and disadvantages.

(1) Barium esophagography is very useful for patients with dysphagia. However, the sensitivity of the test is low for GERD and is not reliable.

(2) Upper endoscopy allows for direct examination and biopsy of the esophageal mucosa and is the best method for excluding esophagitis and Barrett's esophagus, which is associated with an increased incidence of esophageal adenocarcinoma. Endoscopy is frequently necessary in the elderly because older individuals may have "alarm symptoms" such as anemia, dysphagia, and weight loss.

(3) In a patient with noncardiac chest pain, a therapeutic response can be assessed by the "omeprazole test"—that is, taking omeprazole orally (40 mg in the morning and 20 mg in the evening) for 7 days. The sensitivity of this simple test for diagnosing GERD is 78% and the specificity is 85%.

(4) Esophageal manometry (EM) may be used to measure the LES pressure. Although a low LES resting pressure is associated with GERD, only a minority of patients have an LES pressure less than 10 mm Hg. Therefore, EM is most helpful in diagnosing other conditions beside GERD, such as achalasia. EM allows for determination of esophageal function before antireflux surgery.

(5) The "gold standard" for diagnosing GERD is ambulatory esophageal pH monitoring. Traditionally, pH monitoring of the esophagus is performed by inserting a thin probe through the patient's nose into the esophagus 5 cm above the LES. The data were then collected over 24 hours to calculate a reflux score. The sensitivity of the test is about 85% and the specificity is 90%. Alternatively, the Bravo pH monitoring system that is now available in many centers enables the direct placement of the pH sensor into the esophagus during an upper endoscopy. The patient is more comfortable because no catheter is passed through the nose, and the study can continue for a full 48 hours.

Management

The treatment goals in GERD are to alleviate symptoms, prevent complications, decrease the number of reflux episodes, heal erosive esophagitis, and maintain remission.

Lifestyle modification is an important component in overall management. The patient should be instructed to elevate the head of the bed by putting Styrofoam wedges under the mattress. Reducing the intake of fatty foods, chocolate, and excessive alcohol is necessary. Acidic beverages such as colas and orange juice should also be avoided. The patient should not assume a recumbent position after meals, and food should not be taken just before bedrest. Weight reduction and smoking cessation are also helpful.

Acid-Suppressive Medications

Clinical trials have established the safety and efficacy of the four H_2 receptor antagonists (H_2RA)—cimetidine, ranitidine, famotidine, and nizatidine—and five proton pump inhibitors (PPI)—omeprazole, lansoprazole, rabeprazole, pantoprazole, and esomeprazole. PPI therapy is more effective than H_2RAs in healing more severe erosive esophagitis (Boyce, 1997). Relief of heartburn was also more effective with PPI therapy than with H_2RA—77% versus 47% (Chiba, DeGara, Wilkinson, & Hunt, 1997; Kovacs, Wilcox, DeVault, Miska, & Bochenek, 2002). A reasonable starting dose for mild to moderate GERD is twice daily famotidine or ranitidine. For more severe symptoms of GERD or erosive esophagitis, the patient can try a daily PPI. Therapy should continue for at least 8 weeks for typical symptoms of GERD and even longer for atypical symptoms. Ironically, some of the most common side effects of acid-suppressive medications in the elderly are intestinal discomfort and changes in bowel habits.

Prokinetic Medications

Prokinetic drugs (e.g., bethanechol, metoclopramide) aim to promote peristalsis, increase esophageal-acid clearance, and increase the LES pressure. Metoclopramide is the only drug in the United States that is still widely used but it may cause unwanted tardive dyskinesia in some patients; elderly are especially susceptible.

Maintenance Therapy

Without maintenance acid suppression therapy, esophagitis will likely recur. An acid-suppressive agent's ability to maintain remission depends on the dose and the class of medication used. For example, therapy with omeprazole 10 mg daily was superior to ranitidine 150 mg two times per day (Festen, Schenk, Tan, Snel, & Nelis, 1999). Lansoprazole 30 mg daily was more effective than 15 mg daily (Hatlebakk & Berstad, 1997).

Surgery

Antireflux surgery is an alternative often reserved for patients who are refractory to medical management. In selected patients, Nissen fundoplication can result in excellent immediate control of symptoms. However, some patients will still require the use of a PPI long-term (Pessaux et al., 2005). The best results have been obtained with younger patients. Elderly patients may have an increased number of co-morbid conditions, making them less suitable candidates for antireflux surgery.

Recommendations

For patients with typical symptoms not responsive to lifestyle modification and antacid therapy, a brief trial using a H_2RA or PPI is indicated. If there is no response, endoscopy should be performed to rule out Barrett's esophagus and esophagitis. Patients diagnosed with minimal esophagitis can be treated with an H_2RA or an H_2RA plus metaclopromide, or a single PPI. Patients found to have more severe esophagitis can undergo PPI therapy or surgery. Patients with noncardiac chest pain unresponsive to empirical PPI therapy should be tested by esophageal pH monitoring. If acid breakthrough is confirmed, medical therapy should continue for at least 12 weeks.

In summary, the treatment of heartburn is challenging and requires an understanding of the elderly patient and the causes of GERD. The choice of therapy must be individualized based on efficacy, cost, and safety.

IMMANUEL K. HO

See also

Chest Pain: Noncardiac Causes
Gastrointestinal Physiology

Internet Resources

About GERD
http://www.aboutgerd.org/

American College of Gastroenterology
http://www.acg.gi.org/

American Gastroenterological Association
http://www.gastro.org/

GERD Information Resource Center
http://www.gerd.com/

Medline Plus
http://www.nlm.nih.gov/medlineplus/gastroesophagealrefluxhiatalhernia.html

REFERENCES

Boyce, H. W. (1997). Therapeutic approaches to healing esophagitis. *American Journal of Gastroenterology*, *92*(4 Suppl.), 22S–27S.

Chiba, N., DeGara, C. J., Wilkinson, J. M., & Hunt, R. H. (1997). Speed of healing and symptom relief in grade II to IV gastroesophageal reflux disease: A meta-analysis. *Gastroenterology*, *112*(6), 1798–1810.

Festen, H. P., Schenk, E., Tan, G., Snel, P., & Nelis, F. (1999). Omeprazole versus high-dose ranitidine in mild gastroesophageal reflux disease: Short- and long-term treatment. The Dutch Reflux Study Group. *American Journal of Gastroenterology*, *94*(4), 931–936.

Hatlebakk J. G., Berstad A. (1997). Lansoprazole 15 and 30 mg daily in maintaining healing and symptom relief in patients with reflux oesophagitis. *Alimentary Pharmacology & Therapeutics*. Apr;11(2):365–72.

Kovacs, T. O. G., Wilcox, C. M., DeVault, K., Miska, D., & Bochenek, W. (2002). Comparison of the efficacy of pantoprazole vs. nizatidine in the treatment of erosive oesophagitis: A randomized, active-controlled, double-blind study. *Alimentary Pharmacology & Therapeutics*, *16*(12), 2043–2052.

Pessaux P, Arnaud JP, Delattre JF, Meyer C, Baulieux J, Mosnier H. (2005). Laparoscopic antireflux surgery: five-year results and beyond in 1340 patients. *Archives of Surgery*. Oct;140(10):946–51.

Schofield, P. M., Bennett, D. H., Whorwell, P. J., Brooks, N. H., Bray, C. L., Ward, C., et al. (1987). Exertional gastro-oesophageal reflux: A mechanism for symptoms in patients with angina pectoris and normal coronary angiograms. *British Medical Journal, Clinical Research Edition*, *294*(6585), 1459–1461.

Ter, R. T., Johnston, B. T., & Castell, D. O. (1998). Influence of age and gender on gastroesophageal reflux in symptomatic patients. *Diseases of the Esophagus*, *11*(2), 106–108.

HEMATOPOIESIS

As the population ages, some hematologic diseases once considered rare are now more common, including anemia, myelodysplasic syndrome, acute myeloid leukemia, and venous embolic disease. Although pathologic changes that occur in the aging bone marrow are not well understood, these changes are generating scientific interest as the population ages.

Hematopoiesis During the Aging Process

Anemia is common among the elderly, and it has often been assumed that impaired hematopoeisis is part of normal aging. In fact, anemia is not normally found in healthy elderly persons and, when present, is often a marker of another pathologic process such as malignancy, renal failure, bleeding, hypothyroidism, or malabsorption or is a side effect of medication. In several studies of healthy elderly persons, the values for the volume of red blood cells, leukocytes, neutrophils, lymphocytes, and platelets do not significantly differ from those of young adults (Chatta et al.,1993). The fact that peripheral blood cell concentrations in the elderly do not differ from young people suggests that hematopoiesis is similar in both young and elderly adults.

Studies of nonhealthy elderly people provide a striking contrast. Anemia is prevalent among elderly patients who are ill. In a study of 573 consecutive admissions to a VA Medical Center, anemia was found in 50% of patients aged 75 or older. Multiple causes for anemia were found in 53% and single causes were found in 30% of cases. These data are consistent with the hypothesis that older persons are susceptible to developing anemia with concurrent illness—illness may unmask age-associated defects in hematopoiesis that lead to anemia and other cytopenias (Baraldi-Junkins, Beck & Rothstein, 2000).

Dysregulation of Hematopoiesis with Age

Although hematopoiesis in healthy elderly people may be the same as young people, the ability to respond to stress on the hematopoietic system may not be as robust. In a study of hematopoiesis and aging in animals, old mice were found to have impairment in the replacement of blood cells after blood loss (Boggs, 1985). These data correlate with a study of 40 elderly patients with anemia who did not have an appropriate increase in reticulocyte count for the level of anemia, suggesting that there is impaired response to a stimulus that should increase erythropoiesis (Baraldi-Junkins et al., 2000). This observation suggests there is an age-associated dysfunction of erythropoietic progenitors or their regulatory influences during increased hematopoeitic demand.

The hypothesis that elderly patients cannot respond as efficiently as younger patients to hematopoeitic demand has also been looked at in the white blood cell series. Compared to younger mice, old mice given sublethal challenges with a standardized dose of pathogenic Escherichia coli experienced a significantly greater depletion of their neutrophil stores and were not able to replace them during the period of observation. The number and proliferative rates of progenitor cells were reduced in these older animals. Concentrations of hematopoietic progenitors in healthy elderly persons were similar to those of young adults, but the anemic elderly persons had fewer progenitor cells (Rothstein, Christensen, & Nielsen, 1987).

Regulatory Mechanisms of Hematopoietic Dysregulation During Aging

Some have proposed that the observed age-associated hematopoietic defect in all lineages during periods of hematopoietic demand might be due to decreased responsiveness to stimulation by cytokines and growth factors. Some data suggest that elderly patients respond to treatment of erythropoietin-deficient states with epogen and to growth factors such as granulocyte colony-stimulating factor (G-CSF) and granulocyte-macrophage colony-stimulating factor (GM-CSF) (Chatta et al., 1993). Others have proposed that aging-related changes in hematopoietic regulation are caused in part by dysregulation and impairment of the orderly expression of regulatory signals that guide hematopoiesis. Cytokine expression during aging differs from that of young adults. Many studies report either decreased or increased expression of one or several hematopoietic regulators in elderly animals and humans (Buchanan, Peters, Rasmussen, & Rothstein, 1996). Disagreement persists among various investigators about which cytokines and growth factors are affected. The difficulty in interpreting may be because studies are in vitro, different types of cells are being studied, and different stimulators are used to induce cytokine expression (Baraldi-Junkins et al., 2000).

Some consistent results can be found in studies of hematopoietic cells from older humans. These studies strongly suggest that expression of IL-2 decreases and IL-6 increases in elderly persons (Ershler, 2003). Decreased IL-2 expression has been seen in marine and human studies, but not all investigators have been able to document this decrease. It has been suggested that diminished IL-2 expression may be a marker for diminished T-cell function observed during the aging process (Ershler et al., 1993).

There is evidence to support that there is increased IL-6 secretion during aging. IL-6 is an inflammatory cytokine with a wide range of biologic properties: It promotes differentiation of B and T lymphocytes, secretion of immunoglobulin, and activation of T cells and macrophages. IL-6 also has been implicated in a number of age-related diseases. For example, some studies have demonstrated that IL-6 induces bone resorption and may play a role in the development of osteoporosis. Other studies have demonstrated that estrogen inhibits expression of IL-6 by both human and mouse cell lines, supporting a hypothesis that lack of estrogen may contribute to increased IL-6 expression in postmenopausal women (Girasole et al., 1992). The source of increased IL-6 production could be monocytes, fibroblasts, and endothelial cells, although the mechanism of stimulation is not clear. It could be a result of inflammation given that it is secreted by monocytes, granulocytes, and lymphocytes. Increased IL-6 expression may be correlated with neoplasms such as multiple myeloma, lymphoma, CLL, and renal cell carcinoma. High plasma levels of IL-6 are predictive of physical decline in elderly persons (Ershler et al., 1993).

Genetic Mechanisms of Hematopoietic Dysregulation During Aging

Accumulation of genetic mutations in the human genome and mitochondrial genome may be a key factor in hematopoiesis of elderly persons and their ability to respond to hematopoietic demand. Several mechanisms lead to mutations that may alter hematopoeisis and make the elderly more susceptible to developing hematologic disease. One cause of chromosomal change, telomeric shortening, is a mechanism that may affect hematopoeisis in the elderly. *Telomeres* are repetitive sequences at the end of each chromosome that decrease with each round of genetic replication. Each chromosome has an allocation of this genetic material and, when it is used up and the telomeres reach a critical shortness, the cell exits the cell cycle. The telomeres of peripheral blood cells decrease by around 40 base pairs per year throughout adult life. Shortened chromosomes are more susceptible to genetic damage that could predispose to malignant transformation. Genes that are close to the edge of telomeres may undergo early silencing (Ohyashiki, Sashida, Tauchi, & Ohyashiki, 2002).

There also is increasing evidence that patterns of stem-cell self-renewal in bone marrow over time may lead to changes that predispose to abnormal hematopoeisis in the elderly. Some studies looking at patterns of deactivation in the X chromosome in women have suggested a tendency to a more clonal bone marrow with time, with less diversity among the stem-cell population. This could lead to the development of malignant clones that can dominate the bone marrow with time. Genetic regulators of stem-cell function also may play a role in the aging bone marrow with genes such as P53—a tumor-suppressor gene involved in the development of cancer—developing mutations that increase or decrease this gene's function and cause abnormal hematopoiesis. Mutations in the mitochondrial genome may contribute to cumulative damage to the genome because of oxidative stress. The changes in mitochondrial DNA may also lead to dysfunctional hematopoiesis with time.

These genetic changes are fundamental to the development of malignancies found in the bone marrow that increase with age, such as myelodysplasia and acute myeloid leukemia (AML). Myelodysplasic syndrome (MDS) indicates a group of diseases of hematopoietic maturation. In elderly adults, the incidence is 100 per 100,000, the same order of magnitude as colon cancer, and it is the most prevalent hematologic malignancy in patients older than age 75. Milder forms of the disease are often underdiagnosed or ignored because of other co-morbid illnesses. The disease advances to AML in a proportion of patients and these patients have extremely poor prognosis. There is no curative therapy for MDS and it is an area of intensive research investigation.

The frequency of AML increases with age and the median age of patients with this disease is now 64 years. Standard chemotherapy for leukemia in patients older than 65 can result in remission for 40% to 50% of patients, but remissions are brief with 5-year survival less than 10% with median survival 8 to 12 months. Standard chemotherapy is quite toxic in this age group with mortality rates of 25% to 28%. There has been increasing interest in developing less toxic therapies for AML in elderly patients and there are many ongoing clinical trials of new combinations of drugs to treat this disease.

The mechanisms leading to aging of the bone marrow are incompletely understood; however, a picture of age-associated physiologic changes is emerging. In healthy older individuals, hematopoiesis remains normal unless there is increased hematopoeitic demand from stimuli such as blood loss or infection. When the hematopoietic system is challenged, older patients may not be able to respond appropriately. The inability to rise to the challenge of hematopoietic demand and the tendency to develop hematologic disorders such as MDS and acute myeloid leukemia is driven by dysregulation of the cytokine regulatory signals and by the accumulation of genetic mutations over time. Further studies should help devise effective strategies for managing hematopoietic diseases in the elderly.

Ellen K. Ritchie

See also
Anemia

Internet Resources
Leukemia and Lymphoma Society
http://www.leukemia.org/hm_lls

National Heart, Lung, and Blood Institute
http://www.nhlbi.nih.gov/health/public/blood/index.htm

National Cancer Institute
http://www.cancer.gov/

Myelodysplastic Syndrome Foundation
http://www.mds-foundation.org/

REFERENCES

Baraldi-Junkins, C. A., Beck, A. C., & Rothstein, G. (2000). Hematopoiesis and cytokines. Relevance to cancer and aging. *Hematology/Oncology Clinics of North America*, *14*(1), 45–61, viii.

Boggs, D. R. (1985). Hematopoiesis and aging: IV. Mass and distribution of erythroid marrow in aged mice. *Experimental Hematology*, *13*(10), 1044–1047.

Buchanan, J. P., Peters, C. A., Rasmussen, C. J., & Rothstein, G. (1996). Impaired expression of hematopoietic growth factors: A candidate mechanism for the hematopoietic defect of aging. *Experimental Gerontology*, *31*(1–2), 135–144.

Chatta, G. S., Andrews, R. G., Rodger, E., Schrag, M., Hammond, W. P., & Dale, D. C., (1993). Hematopoietic progenitors and aging: Alterations in granulocytic precursors and responsiveness to recombinant human G-CSF, GM-CSF, and IL-3. *Journal of Gerontology*, *48*(5), M207–M212.

Ershler, W. B. (2003). Biological interactions of aging and anemia: A focus on cytokines. *Journal of the American Geriatrics Society*, *51*(3 Suppl.), S18–S21.

Ershler, W. B., Sun, W. H., Binkley, N., Gravenstein, S., Volk, M. J., Kamoske, G., et al. (1993). Interleukin 6 and aging: Blood levels and mononuclear cell production increase with advancing age and in vitro production is modifiable by dietary restriction. *Lymphokine and Cytokine Research*, *12*, 225.

Frasca, D., Pucci, S., Goso, C., Barattini, P., Barile, S., Pioli, C., et al. (1997). Regulation of cytokine production in aging: Use of recombinant cytokines to upregulate mitogen-stimulated spleen cells. *Mechanisms of Ageing and Development*, *93*, 157.

Girasole, G., Jilka, R. L., Passeri G., Boswell, S., Boder, G., Williams, D. C., et al. (1992). 17 beta-estradiol inhibits interleukin-6 production by bone marrow-derived stromal cells and osteoblasts in vitro: A potential mechanism for the antiosteoporotic effect of estroges. *Journal of Clinical Investigation*, *89*, 883.

Ohyashiki, J. H., Sashida, G., Tauchi, T., & Ohyashiki, K. (2002). Telomeres and telomerase in hematologic neoplasia. *Oncogene*, *21*(4), 680–687.

Rothstein, G., Christensen, R. D., & Nielsen, B. R. (1987). Kinetic evaluation of the pool sizes and proliferative response of neutrophils in bacterially challenged aging mice. *Blood*, *70*(6), 1836–1841.

HIP FRACTURES

More than 300,000 hip fractures occur annually in the United States. Most of these occur in individuals older than 70 years as hip-fracture rates double every 5 to 7 years. Fracture rates in women are twice that of men (Florida Agency for Health Care Administration, 2000). Hip fractures also present a great economic burden that will increase exponentially as the population ages. In 1995, the 1-year direct cost of osteoporosis-related hip fractures in the United States was almost $9 billion (Brunner, Eshilian-Oates, & Kuo, 2003).

Falls are the most common cause for hip fracture in an individual predisposed by osteoporosis, but torsional trauma and spontaneous fracture (that results in a fall) may occur (Florida Agency for Health Care Administration, 2000; Winkley, 2005). One-third to one-half of people older than 65 years fall annually (Gillespie et al., 2003). Falls may be caused by poor balance and gait (e.g., the result of neurological disorders, pain, medications, poor vision, acute illness) or by environmental conditions (e.g., slippery floors, clutter, and improper footwear). Like falls, the prevalence of osteoporosis dramatically increases with age. Low bone mass is also associated with female gender, White and Asian races, smoking, alcohol, low calcium and Vitamin D intake, sedentary lifestyle, and certain medications such as corticosteroids. Other risk factors for hip fracture include living in a nursing home; previous history of a hip, vertebral, or Colles (i.e., wrist) fracture; low body weight; tall stature; dementia; alcohol; medications; and others (Winkley, 2005).

Diagnosis

The classic presentation of a hip fracture is the sudden onset of severe hip pain and inability to bear weight, usually preceded by a fall. Physical examination reveals an abducted, foreshortened, and externally rotated leg with localized tenderness and limited range of motion at the hip joint. Atypical presentations may occur, so a full examination is warranted (Brunner et al., 2003; Winkley, 2005). Differential diagnosis includes dislocation; arthritis (including septic); bursitis; avascular necrosis; primary neoplasm or metastasis; neuropathic pain due to lumbar pathology; abdominal or pelvic pathology; or referred pain from the knee, ankle, or foot (Brunner et al., 2003). When plain films of the hip are negative and suspicion for fracture is high, magnetic resonance imaging may be necessary to reveal the fracture and is preferable to bone scan or computed tomography (Brunner et al., 2003; Winkley, 2005). A hip fracture may be intracapsular (e.g., femoral neck fractures) or extracapsular (e.g., intertrochanteric or subtrochanteric fractures) (Brunner et al., 2003). Subtrochanteric fractures are the least common (i.e., less than 3%) and may raise concern for metastatic disease.

Treatment

Orthopedic management consists largely of evaluating the type of fracture and degree of instability in order to select the most appropriate surgical intervention. Surgical repair is recommended within 24 to 72 hours. Typically, nondisplaced femoral neck fractures (Garden I and II) are treated by inserting cannulated screws. Anticoagulation is usually not required and weight-bearing is immediate. Displaced fractures (Garden III and IV) are unstable and are repaired with hemiarthroplasty (or, if very severe, total hip replacement). Although this procedure is associated with higher bleeding risk, chemical (e.g., warfarin) and/or mechanical (e.g., venous compression devices) anticoagulation is necessary because of the increased risk for deep vein thrombosis (DVT) and pulmonary embolism (PE). Weight-bearing can be immediate. The treatment of choice for intertrochanteric fractures is open reduction and internal fixation with a compression-screw device. Displaced and comminuted intertrochanteric fractures are more prone to postoperative displacement and are associated with greater risk for anemia, DVT, and PE. Therefore, full weight-bearing is delayed and chemical anticoagulation is required. Subtrochanteric fractures are treated with an intramedullary device or a screw and plate. Significant bleeding and edema are most likely with this type of fracture, so weight-bearing status and anticoagulation vary. Patients who were bedridden before the fracture, have severe osteoporosis, or have extensively comminuted fractures may be conservatively treated with traction or gentle positioning (Brunner et al., 2003; Lichtblau, 2000).

Careful perioperative medical management and use of an interdisciplinary team are essential to optimize outcome (Koval & Zuckerman, 1994). Common issues in hip-fracture management include timing of surgical intervention; use of invasive perioperative hemodynamic monitoring; anticoagulation with low-molecular-weight heparin or low-intensity warfarin for prophylaxis against DVT and PE; prevention and early diagnosis and treatment of perioperative delirium; appropriate pain control; early mobilization following surgery; and individualized, intensive rehabilitation aimed at maximal functional outcome.

Most patients are discharged from the hospital within a week of surgery and transfer to short-term rehabilitation programs that focus on comprehensive rehabilitation, including coordination of medical, nursing, and physical-therapy management. Some patients are able to go directly home after orthopedic surgery and continue with therapy at home (Florida Agency for Health Care Administration, 2000; Koval & Zuckerman, 1994).

Outcomes

In-hospital mortality following a hip fracture is about 4% and is associated with higher age, multiple co-morbidities, and nursing-home residence (U.S. Congress, Office of Technology Assessment,1994). Postsurgical complications include pneumonia, delirium, anemia, pressure ulcers, surgical site infection, and DVT with PE. Displaced and comminuted fractures carry a higher risk for DVT, PE, anemia and post-operative displacement (Lichtblau, 2000). Since an intracapsular fracture is more likely to disrupt the tenuous blood supply of the femoral head, these fractures are prone to avascular necrosis and poor union (Brunner et al., 2003). Non-operative management is associated with increased mortality due to pneumonia, PE and pressure ulcers (Lichtblau, 2000).

In the year following a fracture, all-cause mortality is between 14% and 36% (Brunner et al., 2003; Koval & Zuckerman, 1994; U.S. Congress, Office of Technology Assessment, 1994). Most agree that mortality directly attributable to hip fracture occurs within one year of the fracture; excess mortality in these patients over the long-term is likely due to underlying frailty and co-morbidities for which the fracture may have been a marker. In most survivors, functional recovery plateaus by six months, although some continue to see improvements for up to a year (Koval & Zuckerman, 1994; U.S. Congress, Office of Technology Assessment, 1994). Unfortunately, fewer than half of patients regain their previous ambulatory function (Brunner et al., 2003; Koval & Zuckerman, 1994). Characteristics associated with complete recovery of pre-fracture ambulatory function are younger age, male gender, absence of dementia and perioperative delirium, greater degree of contact with one's social network, and use of a cane or walker prior to the fracture (Koval & Zuckerman, 1994). Many patients also suffer a loss in psychological well-being and may become homebound or permanently institutionalized (Brunner et al., 2003; Koval & Zuckerman, 1994).

Prevention

Hip-fracture prevention involves a three-pronged strategy to increase bone mass, reduce falls, and minimize the force of impact during a fall. Adequate calcium and vitamin D intake and a healthy lifestyle are crucial to good bone health. Bone-mineral-density testing may identify osteoporosis, which can be treated with oral bisphosphonates (e.g., alendronate), intranasal calcitonin, selective estrogen receptor modulators (SERMs) (e.g., raloxifene), and or subcutaneous parathyroid hormone. Estrogen is no longer recommended for the treatment of osteoporosis, given its other health risks (Brunner et al., 2003). Interventions that have demonstrated the greatest likelihood to reduce falls are multidisciplinary, multifactorial programs that screen for and address fall risk factors in the community setting. Strength and balance training as well as modifications of the home environment are also helpful. However, evidence is lacking for effective falls-prevention interventions in the nursing-home setting (Gillespie et al., 2003). Finally, floor padding, properly worn hip protectors, and low beds may reduce the impact of a fall below the fracture threshold.

LISA A. HONKANEN

See also

Falls Prevention
Fractures
Gait Disturbances
Osteoporosis

Internet Resources

American Academy of Orthopaedic Surgeons
http://orthoinfo.aaos.org

Centers for Disease Control and Prevention
http://www.cdc.gov/ncipc/factsheets/falls.htm

Emedicine Consumer Health
http://www.emedicine.com/emerg/topic198.htm

National Osteoporosis Foundation
http://www.nof.org/osteoporosis/diseasefacts.htm

Osteoporosis and Bone Physiology
http://courses.washington.edu/bonephys/oprisk.html

REFERENCES

Brunner, L. C., Eshilian-Oates, L., & Kuo, T. Y. (2003). Hip fractures in adults. *American Family Physician*, 67(3), 537–542.

Florida Agency for Health Care Administration (2000).

Osteoporosis and hip fractures 2000 report. Available at http://www.floridahealthstat.com./publications/osteohip.pdf

Gillespie, L. D., Gillespie, W. J., Robertson, M. C., Lamb, S. E., Cumming, R. G., & Rowe, B. H. (2003). Interventions for preventing falls in elderly people. *Cochrane Database of Systematic Reviews*, *4*, CD000340.

Koval, K. J., & Zuckerman, J. D. (1994). Functional recovery after fracture of the hip. *Journal of Bone and Joint Surgery (American Volume)*, *76*(5), 751–758.

Lichtblau, S. (2000). Hip fracture. Surgical decisions that affect medical management. *Geriatrics*, *55*(4), 2, 55–56.

U.S. Congress, Office of Technology Assessment (1994). Hip fracture outcomes in people age 50 and over: Background Paper. Report No. OTA-BP-H-120.

Winkley, G. (2005). Fractures, Hip. Available at http://www.eMedicine.com

HISPANIC AND LATINO ELDERS

Hispanics, also referred to as Latinos, are a diverse population, differing greatly in their social, economic, and cultural characteristics. Understanding this diversity is central to meeting aging U.S. Hispanics' health care needs.

Terminology

The terms *Hispanic* and *Latino* are frequently used synonymously in the literature; however, there are regional differences and biases for the various terms. Originally, *Hispanic* referred to individuals who share origins in Spanish-speaking countries (e.g., Mexico, Cuba, Puerto Rico, Honduras, El Salvador, Guatemala, and Costa Rica), whereas *Latino* was an ethnic label for those individuals residing in the United States and of Hispanic descent. U.S. Census terminology was changed in 2000 from "Hispanic" to "Spanish, Hispanic, or Latino" to include Cubans, Mexican Americans, Puerto Ricans, South or Central Americans, or other Spanish cultures or origins, regardless of race. The Eastern United States tends to use the term *Hispanic* more frequently, whereas *Latino* is commonly used in the Western United States, and *Mexican American* or *Latino* are most common in the Southwest region of the country (Talamantes, Lindeman, & Mouton, 2001).

Regardless of the term used, there is substantial heterogeneity among the various Hispanic elder groups. Constituting the largest and fastest growing ethnic minority in the United States, by 2020, the Hispanic older adult population will grow by 76% as compared to 38% for non-Hispanic White and 34% for African American older adults (Kent & Mather, 2002). Comprehensive information regarding elderly Hispanic populations can be found in the Hispanic Established Populations for Epidemiologic Studies of the Elderly (HEPES), the Third National Health and Nutrition Examination Survey (NHANESIII), and the Hispanic Health and Nutrition Examination Study (HHANES).

Factors Influencing Health Care Access

The National Healthcare Disparities Report (Agency for Healthcare Research and Quality 2005) clearly illustrates health care differences for Hispanic elders. Hispanics report a lack of a specific source of care, difficulty and delays in obtaining health care due to financial and insurance reasons, and poor communication with health care providers than non-Hispanic Whites. Living arrangements, gender, marital status, and literacy levels contribute to poor health outcomes. More than half of male Hispanics are married whereas only 38% of the women are married, approximately two-thirds live with a spouse or relative, and two in five Hispanic elders are linguistically isolated and unable to communicate well in English. Educational levels of Hispanic elders vary widely among ethnic groups, with only 29.4% receiving a high school education. Educational levels have a direct impact on poverty, with the primary source of income being Social Security benefits. This may partially result in 20.4% of Hispanic elders living below national poverty levels. Less education predisposes individuals toward higher unemployment and lower-wage jobs. Finally, the rate of uninsured Hispanics is three times that of non-Hispanic Whites (American Heart Association, 2002).

Due to the multiple barriers affecting the well-being of Hispanic older adults, health care providers are encouraged to focus on the day-to-day management issues while understanding the national priorities and policies that effect minority health care. Priorities identified by the National Hispanic Council on Aging (NHCA) during the Elderly Policy Symposium included income security, health promotion, disease prevention, education and outreach, and grandparents raising grandchildren (NHCA, 2005).

Income Security

Identified as a key factor for determining meaningful access to quality health care, treatment, and medication, income security is one of the most difficult national priorities to address. The NHCA cites public education in financial planning for Hispanic elders, changes in U.S. tax policy, investment in language proficiency programs, and commitment to capacity-building community-based organizations as a few of the sweeping changes needed for income security for Hispanic elders to become a reality. Also at issue is the need for U.S. citizens and residents of Puerto Rico to enjoy the same benefits as mainland U.S. citizens. Recognition that Hispanic elders are usually part of an extended family network requires a community-based, lay-educator–driven, and culturally appropriate educational approach to the dissemination of information. Simply translating English materials into Spanish is not enough (NHCA, 2005).

Health Promotion, Disease Prevention, and Health Education

Elders and minority populations have been identified as “priority populations” by the Agency for Healthcare Research and Quality (AHRQ) because their unique health needs require special attention to ensure accessible, affordable, and quality health care (AHRQ, 2005). The majority of chronic diseases prevalent in Hispanic elders require significant self-management specific to diet, exercise, medication adherence, and modifications in lifestyle behaviors to promote health (i.e., smoking and alcohol cessation, stress reduction, and increased physical activity).

Special outreach activities and educational campaigns are needed in Hispanic communities to teach the importance of medical screening and health management to Hispanics who are monolingual Spanish or prefer to speak only Spanish. Additionally, establishing effective protocols for referring individuals to screening centers would benefit Hispanics who commonly receive health care from large public hospitals and rarely experience continuity of care. NCHA proposes community-based health centers, culturally sensitive and appropriate care, the use of lay health educators, and inclusion of Hispanics in long-term research programs to assess the effectiveness of current disease-prevention and health-promotion programs as solutions to increase the awareness and use of services (NCHA, 2005).

Culturally appropriate health education, risk reduction, and health-promotion interventions are particularly important considering the incidence of hypertension, diabetes, and cardiovascular disease in Hispanic populations. Diseases of the heart, stroke, and cancer account for 46.6% and 54.9% of deaths in Hispanic males and females, respectively (American Heart Association, 2002). Hypertension, especially untreated hypertension, is alarmingly high. Despite effective treatment measures, only 17% of Hispanics with hypertension have appropriate blood pressure control (MMWR, 2005). The lack of blood pressure control significantly impacts the rate of stroke because long-standing, uncontrolled hypertension is the number one risk factor for stroke. According to the U.S. Census Bureau, the incidence of stroke in Hispanics has increased 34% since 1980, and the event tends to occur at an average age of 67 as compared to 80 years for non-Hispanic Whites (American Heart Association, 2002). Hispanic elders have different risk factors for stroke than the non-Hispanic White comparison group, including a higher incidence of diabetes, increased use of alcohol and tobacco, higher obesity rates, lower leisure-time physical activity rates, lack of transportation, and multiple language barriers (Salud Es Vida, 2004).

The incidence of pancreatic, liver, gallbladder, uterine, cervical, and stomach cancers occurs at almost twice the rate compared with non-Hispanic Whites (American Cancer Society, 2003). Screening tests to detect breast, colon, cervical, and prostate cancer in its earliest stages are less used by Hispanics than by non-White Hispanics and African Americans (American Cancer Society, 2003). It is interesting that mammography, Pap smear, colonoscopy, and a digital rectal exam are partially or fully reimbursed by Medicare, yet elderly Hispanics are not taking advantage of these services. Research indicates that Hispanic women are traditionally the least likely racial and ethnic group to take advantage of cancer screening and early detection modalities (American Cancer Society, 2003).

Caregiving Issues

Extended-family support systems are not unique to Hispanics and may lessen caregiver burden while lengthening community residency for an elder. However, a recent caregiving trend raises a new and critical issue: elderly grandparents caring for grandchildren. This has become such a concern for Hispanic elders that the NCHA made it a priority discussion topic in the Elderly Symposium Policy Conference in 2005. As cited in the symposium deliberations, relatives are raising 6 million children in the United States, with 2.4 million grandparents providing the care.

Approximately 60% of the grandparents will be more likely to live in poverty than their peers. Grandparents between the ages of 50 and 64 are most likely to be raising their grandchildren and will suffer significant physical and mental decline related to their caretaking responsibilities. These informal networks, albeit often beneficial for the child, are rarely recognized via substantive government policy for any formal financial or social assistance. The situation leaves the elder with minimal, if any, financial compensation, and a plethora of legal and medical responsibilities that can be overwhelming to already taxed personal resources. The NCHA suggests that subsidized guardianships, extension of health benefits to children raised by grandparents, increased housing and rental subsidies or assistance, and elder respite care are viable solutions for this evolving concern.

Language Barriers

In addition to cultural barriers, many Hispanic elders face language barriers. Older adults who do not speak proficient English face complex obstacles when using the health care system. Cuban elders are most likely to have insufficient language proficiency, followed by Puerto Ricans and Mexican Americans. Even Spanish-language instructions can be difficult to comprehend because many elder Hispanics may be illiterate in Spanish as well, or written materials in Spanish may not be targeted to the literacy level of the aged Hispanic population. Primary care providers must be cautious and judicious in the use of oral translation because the translators, who are often relatives of the elder, may have varying levels of fluency in Spanish. These relatives may edit, filter, or otherwise misconstrue important information necessary for a complete patient evaluation. In addition, lack of interpreter–patient linguistic equivalency may lead to inaccurate paraphrasing. Imposition of the interpreter's beliefs or self-perception into the interaction also influences the information exchange. Finally, cultural perceptions, such as the stigmatization of mental illness, may result in poor communication. Effective communication requires that clinicians providing care to Hispanic elders be conversant in Spanish or have trained medical translators or bilingual staff.

Folk Medicine and Traditional Beliefs

The frequency with which individuals use the services of unlicensed healers, herbalists, and spiritual healers probably varies among the Hispanic American subgroups. Examples of these alternative services include the use of Curanderos in the Mexican American communities, Santeria among Cuban Americans, and Espiritismo among Puerto Ricans. In the HHANES study, 4.2% of subjects reported consulting a Curandero, herbalist, or other folk medicine practitioner within the prior 12 months. Health providers should inquire about the use of alternative healers (i.e., *verbas medicinales*). Additionally, providers should ascertain where medications are purchased because many Mexican Americans who live in the Southwest cross into Mexico, where medications can be bought without a prescription. A common belief among some Hispanic elders is that health is dependent on a "hot-cold" balance. For example, to cure a "cold" disease, a "hot" treatment is necessary and vice versa. The majority of treatments involve the use of natural medications, such as herbal teas or soups.

Optimal health care for the Hispanic population requires that health care providers embrace the cultural diversity of the populations they serve. Elder Hispanics are the fastest growing segment of the minority population and they share many common cultural links. Unique barriers exist, and their solutions will often involve not only the individual and family's efforts but sustainability of the actions will also require community and national efforts. Understanding culturally specific characteristics of Hispanic elders can enhance the quality of health care services, facilitate meaningful and culturally appropriate interventions, and ensure a mutually healthy relationship.

Anne C. Thomas

See also

Alternative and Complementary Medicine
Communication Issues for Practitioners
Cultural Competence and Aging

Internet Resources

Administration on Aging
http://www.aoa.gov/press/fact/alpha/fact_serving_hispanicamer.asp

Horizon Project
http://latino.si.edu/virtualgallery/GrowingOld/Nationwide%20Demographic.pdf

National Hispanic Council on Aging
http://www.nhcoa.org/site/nhcoa/content.php?type=1&id=12461

REFERENCES

Agency for Healthcare Research and Quality (2005). *National healthcare disparities report.* U.S. Department of Health and Human Services. Rockville, MD: AHRQ Publication Number 06-0017.

American Cancer Society (2003). *Cancer facts & figures for Hispanics/Latinos: 2003–2005.* Atlanta, GA.

American Heart Association (2002). *Biostatistical fact sheet—populations: Hispanics and cardiovascular diseases.* Available at http://www.americanheart.org/downloadable/heart/1014748201198FS05HIS2WEB.pdfM

Kent, M., & Mather, M. (2002). What drives U.S. population growth? *Population Bulletin*, *57*(4), 3–10.

MMWR Weekly (2005). Racial/ethnic disparities in prevalence, treatment and control of hypertension – United States 1999–2002, 54(1), 7–9. Available at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5401a3.htm

National Hispanic Council on Aging (2005). Improving the well-being of Latino older adults: Recommendations and solutions. Deliberations from the 2005 Hispanic elderly policy symposium. Available at http://www.whcoa.gov/about/des_events_reports/PER_DC_09_30_05.pdf

Salud Es Vida – Health is Life (2004). Available at http://www.strokeassociation.org/presenter.jhtml?identifier=3030389

Talamantes, M., Lindeman, R., & Mouton, C. (2001). Ethnogeriatric curriculum module: Health and health care of Hispanic/Latino American elders. Available at http://www.stanford.edu/group/ethnoger/hispaniclatino.html

HOME-HEALTH CARE

Before the advent of Medicare home-health benefits in 1965, approximately 1,400 visiting nurse associations and local health departments provided family-focused health promotion and sickness care services. Currently, more than 20,000 agencies offer services to nearly 8 million clients (National Association for Home Care & Hospice [NAHC], 2004). Many newer providers are hospital-based or proprietary, for-profit agencies. The dramatic escalation has been in response to the reduced length of hospital stays, passage of national legislation that made it easier to establish new agencies, wider acceptance of home care, and an aging population.

Agencies have diversified their programs, services, and staff to meet the needs of clients, families, and referral sources, and have added high-technology procedures, 24-hour care, hospice programs, pharmacy services, durable medical equipment, and telehealth programs.

Persons 65 years of age and older constitute approximately 70% of all home-health clients, and those older than 85 years of age constitute approximately 20%. Circulatory system disease accounts for about 30% of referrals; neoplasms and endocrine diseases, especially diabetes, are common primary medical diagnoses. Approximately 111,000 registered nurses, 48,000 licensed practical nurses, 320,000 home-care aides, 13,000 physical therapists, 6,000 social workers, and 5,000 occupational therapists are employed in home health (NAHC, 2004).

The average number of home-health visits (all disciplines) per client increased from 33 in 1990 to 74 in 1996, and decreased to 30 visits by 2004 (NAHC, 2004). Regulations and reimbursement often determine whether clients are admitted to services, the frequency and length of visits, which disciplines provide services, and the time of discharge.

Home-Health Care Practice

Core principles of home-health practice are constant, but other aspects of practice are changing dramatically. Effective home-health nurses and other clinicians need extensive technical, interpersonal, and critical-thinking skills. When clinicians work in a hospital or nursing home, colleagues, technology, supplies, and references are nearby. When clinicians make a visit to a home, clinic, or other site, they are usually alone. Home-health clinicians need to be creative and well informed about community resources; they need to have contingency plans for their daily schedules and for their clients' and their own safety. They need to work as partners with diverse clients (e.g., diversity in age, medical and nursing diagnoses, race, language, religion, culture, income, and values) to help them attain their maximum levels of self-care and independence. As part of that partnership, clinicians help clients follow regulations, including those that involve reimbursement.

While many clinicians provide generalized home-health services, some have specialized skills involving cardiovascular disease, diabetes, infusion therapy, wound care, hospice, parent-child, and AIDS. Some larger agencies employ staff members who have advanced nursing practice credentials, such as geriatric nurse practitioners or clinical specialists.

Many agencies have begun to use technology in response to increasing communication, distance, clinician safety, client complexity, and outcome-management challenges. Agencies are implementing standardized terminologies, automated clinical information systems, and telehealth to improve the quality of practice, documentation, and information management. As part of the federal electronic health record initiative, SNOMED CT®, LOINC, and HL7 were selected as reference terminologies to promote the standardization and exchange of clinical data (Martin, 2005). Telemonitoring offers an additional way for clinicians to track vital signs and blood pressure, weight, oxygen saturation, and other data that suggest early changes in client status. Telehealth encourages clients to become more involved in and informed about their own care (Home Healthcare Nurse, 2004).

Description and Measurement of Practice

Recent developments, including the use of technology, have helped home-health agencies collect more accurate clinical data and convert those data to information. In addition, Medicare publicizes agency-quality indicator data and is proposing pay-for-performance initiatives that would offer financial incentives for exceeding established levels of quality.

Problem-solving Process

Home-health clinicians are interested in evidence-based practice. The six steps of the problem-solving process offer a useful strategy to describe and measure their practice, especially when these steps are combined with standardized vocabularies and automated clinical information systems. The steps are assessment, problem identification/diagnosis, plans, interventions, evaluation, and outcome management. One research-based method, the Omaha System, illustrates application of the process in home-health practice.

Assessment and Problem Identification/diagnosis

When home-health clients are referred for service, assessment and diagnostic information should accompany the referral. However, as part of the admission process, a focused and comprehensive assessment needs to be completed that addresses environmental, psychosocial, physiological, and health-related issues. Since 1999, the Centers for Medicare and Medicaid Services mandated that the staff of Medicare-certified home-care agencies complete an Outcome and Assessment Information Set (OASIS) with more than 80 items when they admit new clients; children and pregnant women are excluded. OASIS data must also be submitted at interim periods and discharge.

The assessment should involve a team approach, with members of various disciplines communicating and contributing relevant data. Often, a case manager is responsible for obtaining additional information from the referral source and communicating pertinent information to the client's home-health-care physician and insurance or health-plan case manager.

After reviewing referral data and physicians' orders, nurses identify the home-health client's problems—for example, income, circulation, and nutrition (Martin, 2005). Nurses then prioritize the problems in partnership with clients and families—a crucial step in determining on which problems they will actively work.

Plans and Interventions

Just as clients' assessments and diagnoses need to be focused, so do care plans and interventions. Interventions used frequently by the home-health multidisciplinary team include health teaching, guidance, and counseling; treatments and procedures; case management; and surveillance (Martin, 2005). Nurses may instruct clients in the use of a glucometer, give injections, collaborate with physical and occupational therapists about clients' post-stroke needs, refer clients to Meals on Wheels or registered dietitians, or monitor environmental modifications to decrease the risk of falling.

The average duration of home-health care services has been decreasing due to regulations and reimbursement even though the complexity of clients' needs is increasing. Thus, care plans and interventions should be selected for the client's priority problems. Ideally, the client, family, and health care team members share the goal of self-care or achieving the greatest degree of independence possible. Clinicians need to anticipate whether other types of services will be required after discharge from home-health care services.

Evaluation and Outcome Management

Simple, valid, and reliable instruments are needed to evaluate best home-health practices. Increasingly, third-party payers and accreditors require home-health agencies to provide quantitative data that describe the clients they serve, the types of services they provide, the effects of those services on clients, and the costs of services. OASIS data can be used to evaluate home-care effectiveness as well as hospitalization rates. Client records are a major source of clinical data for an outcome-management program if agencies have automated clinical information systems. Clinicians need to ask and document the following: What works best? Has the client improved?

By how much? From what perspective? One approach is to use the Omaha System's Problem Rating Scale of Outcomes, a 5-point Likert-type scale designed for use with specific client problems. It includes three separate numeric subscales for knowledge, behavior, and status (Martin, 2005). Ratings offer cues to help clinicians select the most appropriate interventions for the client and provide a baseline for tracking knowledge, behavior, and status data throughout the duration of service. Data collection is repeated at established intervals and at discharge. The clinical data produced by the ratings can be analyzed in conjunction with staffing, length of service, cost, and other statistical data.

Related Research

Data analysis and research offer important strategies for identifying best practices and disseminating the benefits of home-health services. Although agencies regularly collected extensive clinical data, those data usually remained in data cemeteries. Only recently have agencies introduced the needed rigor, methods, and technology to use their data. An entire issue of a home-health journal was devoted to the use of clinical data.

A series of funded studies have focused on the transitional-care model and interventions provided by advanced practice nurses. Earlier research addressed the needs of clients who had cardiac conditions, whereas recent clients were cognitively impaired. All were at high risk of rehospitalization (Naylor, Stephens, Bowles, & Bixby, 2005).

Nearly 400 agencies participated in the Briggs National Quality Improvement/Hospital Reduction Study (NAHC, 2006). When data were analyzed, 15 strategies were associated with reduced hospitalization rates. Participating agencies used six strategies intentionally and more frequently: fall prevention programs, increased number and frequency of visits scheduled soon after referral, positive management culture, 24-hour availability and response programs, medication management, and case management.

Karen S. Martin

See also

Medicaid

Medicare

Medicare Managed Care

Mild Cognitive Impairment: Controversy in Nomenclature and Treatment

Internet Resources

American Nurses Association's description of 13 recognized terminologies
http://www.nursingworld.org/npii/terminologies.htm

Centers for Medicare and Medicaid Services
http://www.cms.hhs.gov/ and http://www.medqic.org

National Association for Home Care
http://www.nahc.org

Visiting Nurse Associations of America
http://www.vnaa.org

REFERENCES

Martin, K. S., ed. (2004). Transforming clinical data into critical outcome information: How to survive in the new data-driven world. *Home Health Care Management and Practice*, *16*(3).

Home Healthcare Nurse (2004). Technology and telehealth. *Home Healthcare Nurse*, *22*(10), 662–675.

Martin, K. S. (2005). *The Omaha System: A key to practice, documentation, and information management* (2nd ed.). St. Louis, MO: Elsevier.

National Association for Home Care & Hospice (2004). *Basic statistics about home care*. Available at http://www.nahc.org/04HC_stats.pdf

National Association for Home Care & Hospice (2006). *Briggs National Quality Improvement/Hospitalization Reduction Study*. Available at http://www.nahc.org/NAHC/CaringComm/eNAHCReport/datacharts/hospredstudy.pdf

Naylor, M. D., Stephens, C., Bowles, K. H., & Bixby, M. B. (2005). Cognitively impaired older adults: From hospital to home. *American Journal of Nursing*, *105*(2), 52–61.

HOMELESS ELDERS

A key problem in studying and understanding the magnitude of elder homelessness in the United

States is the lack of a clear definition of "older homeless" individuals. Some researchers, noting that homeless individuals look and behave 10 to 20 years older than their actual ages and have significant physical and psychological health problems, define an older homeless person as any homeless individual older than age 50 (Cohen, 1999). With this criterion in mind, it has been estimated that there are between 60,000 and 400,000 older homeless individuals in the United States today, with the number of homeless people older than age 50 projected to double by 2030. It is also predicted that more homeless persons older than 50 in 2030 will be women and individuals from diverse racial and ethnic groups (Burt, 1996). With predictions of shifting demographics among the future elder homeless, nurses, social workers, physicians, and others caring for homeless individuals need to prepare to meet their increasingly complex health and social needs.

Increased homelessness among elderly persons is largely due to the lack of affordable housing and the prevalence of poverty among certain segments of the aging populace. The inability to afford mortgage or rental payments is compounded by relationship changes (e.g., divorce; death of spouse, partner, or relative), physical and mental illness, and/or addictive behaviors (e.g., alcohol or gambling problems) in many homeless elders, leading to the lack of a fixed and regular place of residence (Crane et al., 2005). Although some individuals resort to sleeping on the street, many more find shelter in temporary accommodations such as welfare hotels, congregate shelters, and transitional housing.

Men, particularly White men, outnumber women four to one among the aging homeless population (Bissonette & Hijjazi, 1994). Given this male predominance, it is not surprising that most studies of homeless elders' health and social needs have focused on small convenience samples of homeless older men. Studying older homeless women may be difficult because women do not use public health care facilities as readily as men. Further, when they do seek services, older women find that there are few homeless agencies prepared to provide services for their special needs (Kisor & Kendal-Wilson, 2002). Older homeless women are therefore less likely to make contact with the health care system and more likely to be overlooked in clinical research and practice.

Numerous studies have established that older homeless persons suffer substantially more physical illness than younger homeless adults and domiciled elders. For example, cardiovascular risk is significantly higher among homeless elders, who have disproportionately higher incidence of hypertension, diabetes, and smoking (Szerlip & Szerlip, 2002). These illnesses, often untreated because of underutilization of health services, lead to higher mortality among homeless elders when compared to their nonhomeless peers.

Many health problems experienced by older homeless persons are exacerbated by chronic alcoholism and drug addiction. Although alcoholism and prescription drug dependence are more typical among older adults, the prevalence of heroin, crack cocaine, and other substance abuse is also on the rise among aging baby boomers (Substance Abuse and Mental Health Services Administration, 2002). The shift in geriatric substance abuse creates new challenges for health care professionals. Illnesses often associated with homelessness and addiction, such as HIV/AIDS, need careful consideration when caring for older homeless adults (Emlet & Poindexter, 2004).

There is also compelling evidence that homeless elders have higher overall rates of mental illness than the general older population, as well as limited access to mental health care services (Crane et al., 2005). Estimates suggest that 10% to 15% of homeless elders have a serious or chronic mental illness, including alcohol and drug abuse and dependency, anxiety disorders, depression, and schizophrenia. Despite this prevalence, few studies address the mental health needs; assess the possibility of alcohol-related dementia among older homeless persons; or consider the long-term effects of drug misuse on their physical, psychosocial, and spiritual health.

Housing programs alone cannot solve the problems of the homeless elderly. Although stable housing is crucial to the well-being of older homeless persons, recent intervention strategies have included community-based interdisciplinary programs whose focus is on housing and case management. Thus, there is growing recognition that older homeless men and women have special needs that span the gamut from health factors to safety issues.

BARBARA L. BRUSH

Internet Resources

The Committee to End Elder Homelessness
http://www.ceeh.org

National Coalition for the Homeless
http://www.nationalhomeless.org

REFERENCES

Bissonnette, A., & Hijjazi, K. M. (1994). Elder homelessness: A community perspective. *Nursing Clinics of North America*, 29, 409–416.

Burt, M. R. (1996). Homelessness: Definitions and counts. In J. Baumohl (Ed.), *Homeless in America* (pp. 15–23). Phoenix, AZ: Oryx Press.

Cohen, C. I. (1999). Aging and homelessness. *The Gerontologist*, *39(1)*, 5–14.

Crane, M., Byrne, K., Fu, R., Lipmann, B., Mirabelli, F., Rota-Bartelink, A., et al. (2005). The causes of homelessness in later life: Findings from a 3-nation study. *Journal of Gerontology*, *60B*(3), S152–S159.

Emlet, C., & Poindexter, C. (2004). Unserved, unseen, and unheard: Integrating programs for HIV-infected and HIV-affected older adults. *Health and Social Work*, *29*(2), 86–96.

Kisor, A. J., & Kendal-Wilson, L. (2002). Older homeless women: Reframing the stereotype of the bag lady. *Afflilia*, *17*(3), 354–370.

Substance Abuse and Mental Health Services Administration. (2002). *Substance use by older adults: Estimates of future impact on the treatment system.* Rockville, MD: Substance Abuse and Mental Health Services Administration.

Szerlip, M. I., & Szerlip, H. M. (2002). Identification of cardiovascular risk factors in homeless adults. *The American Journal of the Medical Sciences*, *324*(5), 243–246.

HOMOSEXUAL ELDERS

See
Gay and Lesbian Elders

HOSPICE

Hospice and palliative services developed in response to the changing circumstances surrounding death and the awareness of inadequate care at the end of life. Hospice care can provide the needed enhanced comfort and support for patients and families to experience improved quality end-of-life closure. Hospice is a type of care that offers palliative rather than curative treatment to patients in the final stages of life-limiting illness. The goal is the provision of pain and symptom management resulting in death with dignity and a sense of closure for both the patient and the family.

Hospice is a program of care provided across a variety of settings and based on the understanding that dying is a part of the normal life cycle. Hospice promotes the idea of "living until you die" (NHPCO, 2004) and supports the patient through the dying process and the surviving family through the dying and bereavement process (Egan & Labyak, 2006). It provides comprehensive medical and supportive services in the home, in residential facilities, hospitals and nursing facilities and other settings (e.g., the homeless, prisons) (End-of-Life Nursing Education Consortium ELNEC, 2006).

Hospice care is now used by half of dying Medicare cancer patients and 19% of dying Medicare patients overall (Hogan, Lunney, Gabel, & Lynn, 2001; NHPCO, 2002). Nearly a third of the nation's 3,200 hospices are hospital-based, and many hospital, nursing-home, and home-care-agency palliative-care programs have been both initiated and supported by hospice professionals. Data suggest that palliative-care programs in a range of care settings result in marked increases in the number of appropriate and timely referrals to hospice. Hospice care offers a support system to help patients live as actively as possible until death and to help the family cope with the patient's illness and their own bereavement.

Eligibility

Surveys indicate that patients prefer to die at home, yet only 29% of terminally ill patients enroll in hospice programs (NHPCO, 2004). The numbers are higher (approximately 50%) for cancer patients (Lynn, Schuster, & Kabcenell, 2000), but even less frequently utilized in long-term care:13% of hospice enrollees were in nursing homes; 70% of nursing homes had no hospice patients at all (Meisel Snyder, & Quill, 2000). People in the final stages of heart, lung, and liver disease; dementia; neurological disorders such as amyotrophic lateral sclerosis; and AIDS greatly benefit from hospice care.

For a patient to be eligible for the Medicare-reimbursed hospice benefit, a physician must certify that to the best of his or her knowledge the patient has a life expectancy of 6 months or less. This requirement is often responsible for a delay in hospice referral; physicians may be reluctant to estimate life expectancy, especially with regard to nononcological diseases.

Hospice Services

At the time of admission, the hospice obtains the necessary medical information from the referring physician. The hospice medical director must concur with the diagnosis of a terminal illness. Most hospices welcome the opportunity to include primary care physicians on the hospice interdisciplinary teams, which establishes the plan of care. The hospice team and the patient's physician work together to maximize quality of life by jointly developing the Plan of Care. The Plan of Care is based on the patient's diagnosis, symptoms, and other needs. The hospice program and the patient's physician must together approve any proposed tests, treatments, and services. In general, only those treatments that are necessary for palliation and/or management of the terminal illness will be approved (Turner, 2003).

The team usually consists of a physician, hospice nurses, social workers, clergy, home health aides, and volunteers; other participants might include a dietitian, physical therapist, occupational therapist, speech and swallowing therapist, and bereavement counselor. The patient and family are also important members of the team and are encouraged to participate in the decision making and in formulating a plan of care oriented to the patient's comfort.

A nursing evaluation is done within the first 24 hours and covers not only the patient's physical status but also his or her psychosocial and spiritual needs. Although nurses work under a physician's supervision, the specially designed system of protocols and "as-needed" orders allows them greater independence in symptom management.

The social worker assists the patient and family with advance directives, management of resources, and insurance, as well as providing emotional and spiritual support. Any unresolved spiritual issues are referred to clergy and spiritual counselors, who also provide support in bereavement counseling.

Hospice care can be provided in a variety of settings, most frequently in the patient's home, but also in acute-care settings (i.e., hospitals), long-term-care institutions (i.e., assisted-living facilities, nursing homes), and hospice residential facilities. In addition to making frequent visits, team members are available by telephone 24 hours a day. Care can be provided at different levels of intensity, ranging from brief daily visits to continuous home care, depending on the patient's needs.

Medical care of a hospice patient focuses on aggressive pain and symptom control. Pain and symptom control is achieved through standing orders for around-the-clock analgesia (rather than as-needed doses). Other common symptoms such as anorexia, dyspnea, confusion, incontinence, and skin breakdown can be a source of great discomfort to dying patients. The hospice team is specially trained in identifying and addressing these problems.

Bereavement support is a vital component of hospice care; end-of-life care does not end with the death of the patient. Grief and bereavement interventions begin at admission with attention to anticipatory needs and multiple losses of both patient and family. Bereavement support is provided to help the family work to normalize grief, access needed services, and refer high-risk families to specialists (Egan & Labyak, 2006; ELNEC, 2006).

Reimbursement

Medicare Part A, Medicaid, and most private insurance policies cover hospice care. Medicare pays for covered services using a *per diem* capitated arrangement in one of the following four categories:

- *Routine Home Care* ($100/day): care at home or nursing home
- *In-patient Respite Care* ($110/day): care in an in-patient setting (nursing home or hospital) for short periods (up to 5 days) to give caregivers a rest
- *General In-patient Care* ($550/day): acute inpatient care for conditions related to the terminal illness (e.g., pain and symptom control, caregiver breakdown, impending death)
- *Continuous Home Care* ($660/day): provides acute care at home with around-the-clock care for a crisis that might otherwise lead to in-patient care

The rates of reimbursement are fixed for each category of care on an annual basis, but they vary by geographical location (Turner, 2003).

Medicare requires the primary care physician and hospice medical director to certify that the patient's life expectancy is 6 months or less. Medicare beneficiaries are required to sign a statement electing hospice care, thus waiving traditional Medicare benefits covering curative treatment for the terminal disease. Patients can be hospitalized or undergo surgery to palliate their symptoms. A do-not-resuscitate (DNR) order is optional; however, many patients elect not to be resuscitated.

The Medicare hospice benefit covers medications, durable medical equipment, treatments related to the terminal diagnosis, nursing visits, home health aide visits, social work, and bereavement care. It does not cover aggressive curative treatment of the terminal illness, services that are not part of the palliative plan of care or are not pre-approved by the interdisciplinary hospice team, or services that duplicate hospice care and are provided by a facility that does not have a contract with the hospice. Many hospices are expanding service options so that patients and families can receive palliative care long before the last 6 months of life to meet the needs of patients dying from chronic illness (Egan & Labyak, 2006). The patient can revoke the hospice service at any time and for any reason. After a patient signs a written consent indicating his or her wish to revoke hospice care, regular Medicare benefits will be reinstated.

Improving Hospice

Open and Honest Communication

One factor in effective end-of-life care is keeping patients and their family informed about the disease and its progression and giving everyone involved ample opportunity to ask questions and bring up unresolved issues. Open and honest communication can result in realistic goals and a plan of care that best suits the needs and wishes of the patient and family.

Early Referrals

The patient and family should be given enough time to absorb and accept the idea of hospice. From the hospice team's standpoint, early referral gives the team more time to understand and anticipate the patient's needs. Delayed access to hospice and palliative-care services is a considerable barrier in the provision of excellent end-of-life care. The average time spent in hospice averages approximately 1 week, primarily because the services are not well understood and there is a lack of understanding of what comprehensive palliative-care programs offer. More timely referrals are necessary in order for patients and families to reap the full benefits of hospice and palliative-care services (ELNEC, 2006).

Financial Barriers

Issues regarding access to care, insurance coverage, and the potential need to hire a caregiver from outside the family contribute to financial barriers to care (NHPCO, 2002). As of 2002, 41% of hospices were delivering palliative-care services outside the Medicare Hospice Benefit, and another 19% were planning such services in order to increase access to palliative care to patients who are ineligible for or unwilling to enter hospice programs.

Conclusion

Hospice and palliative-care services offer aggressive noncurative treatments and interventions. Patients and families receive support and care based on their unique goals and needs and is extended to all patients and families across diverse life-threatening illnesses.

MARIANNE MATZO

See also

Death Anxiety

Palliative Care

Internet Resources

American Academy of Hospice and Palliative Medicine
http://www.aahpm.org/

Center to Improve Care of the Dying
http://www.gwu.edu/~cicd/

National Hospice and Palliative Care Organization
http://www.nhpco.org

U.S. General Accounting Office
http://www.gao.gov

REFERENCES

Egan, K. A., & Labyak, M. J. (2006). Hospice palliative care: A model for quality end-of-life care. In B. R. Ferrell & N. Coyle (Eds.), *Textbook of palliative nursing* (2nd ed.) (pp. 13–46). New York: Oxford University Press.

Hogan, C., Lunney, J., Gabel, J., & Lynn, J. (2001). Medicare beneficiaries' costs of care in the last year of life. *Health Affairs 20*(4), 188–195.

Last Acts (2002). *Means to a better end: A report on dying in America today*. Available at http://www.rwjf.org/files/publications/other/meansbetterend.pdf

Lynn, J., Schuster, J. L., & Kabcenell, A. (2000). *Improving care for the end of life: A sourcebook for health care managers and clinicians*. New York: Oxford University Press.

Meisel, A., Snyder, L., & Quill, T. (2000). American College of Physicians—American Society of Internal Medicine End-of-Life Care Consensus Panel. Seven legal barriers to end-of-life care: Myths, realities and grains of truth. *Journal of the American Medical Association*, *284*(19), 2495–2501.

National Hospice and Palliative Care Organization (NHPCO). (2002). *Delivering quality care and cost-effectiveness at the end of life: Building on the 20-year success of the Medicare Hospice Benefit*. Alexandria, VA.

National Hospice and Palliative Care Organization (NHPCO). (2004). *NHPCO facts and figures sheet*. Alexandria, VA: Author. Available at www.nhpco.org/files/public/Facts%20Figures%20Feb04.pdf

Turner, R. (2003, April). Fast Facts and Concepts #87. Medicare Hospice Benefit: Part II Places of Care and Funding. End-of-Life Physician Education Resource Center. Available at http://www.eperc.mcw.edu

HOSPITAL-BASED SERVICES

In nonfederal hospitals, patients 65 years of age and older account for 38% of all discharges and 45% of in-patient days of care. Rates of hospitalization are more than twice as high for patients age 85 years and older compared with patients age 65 to 74 years (Kozak, Lees, & DeFrances, 2006). Older patients have longer hospitalizations, higher mortality rates, and higher rates of nursing-home placement. Furthermore, hospitalization is associated with the risk of functional decline or physical disability during the course of treatment for an acute medical illness (Palmer, 2003). Functional decline during hospitalization occurs more often in patients who are older than age 75, cognitively impaired, and dependent at baseline (prior to the acute illness) in two or more instrumental activities of daily living (IADL).

Clinical studies demonstrate that at least some of the poor functional outcomes of hospitalization can be attenuated through improved processes and systems of care. Several promising models of hospital care have evolved in recent years and are potentially applicable to most hospitals in the United States. Most of the successful models have been nurse-driven, often employing an advanced practice nurse. Interdisciplinary models are common and frequently include geriatricians, nurse specialists, physical and occupational therapists, speech therapists, social workers, and dietitians. The usual objectives are to improve functional outcomes, reduce hospital length of stay, prevent nursing-home admissions, and prevent unplanned rehospitalization (Palmer, 2003).

Acute Care for Elders (ACE) Units

The goal of an ACE unit is to prevent functional decline that results from processes of care (e.g., polypharmacy, imposed bedrest, inadequate medical standards of care, uncoordinated care) and patient characteristics (e.g., depression, cognitive impairment, physical disability) that often go undetected or untreated (Palmer, 2003). Although the size and objectives of ACE units may vary considerably, they have in common four main components: a prepared environment, patient-centered care, interdisciplinary team rounds and discharge planning, and medical care review. The physical environment of the ACE unit is designed to enhance the patient's independent functioning in activities of daily living (ADL) and mobility. For example, ACE units avoid clutter in hallway corridors and include carpeted rooms or specialized floors in rooms or hallways, grab bars in bathrooms and rails in hallways, and common activity areas to permit dining outside of rooms or socializing with family. Patient-centered care includes a multidimensional assessment at the time of admission and an interdisciplinary team care plan to maintain or restore the patient's independent functioning in basic ADL and to coordinate discharge plans.

An ACE unit may be either a discrete nursing unit (all beds) or a "virtual unit" with a mixed population of elderly and nonelderly patients. ACE units have shown the potential to reduce the incidence of functional decline in older patients, the length of hospital stay, and the risk of nursing-home admission after hospital discharge (Landefeld, Palmer, Kresevic, Fortinsky, & Kowal, 1995). They also appear to improve mobility at hospital discharge and to increase caregiver and physician satisfaction with care (Counsell et al., 2000). They are used as sites for training of health professionals in the care of older patients and for conducting quality-improvement studies. In addition, the ACE model of care has been transported to other settings, including cardiology and stroke units.

Geriatric Care Program

A gerontological clinical nurse specialist working with trained resource nurses—registered nurses with additional training in geriatrics—focuses nursing care on patients at high risk for functional decline. The intervention includes identification and monitoring of frail older patients, twice-weekly rounds of a multidisciplinary geriatric care team, and a nursing-centered educational program. In a clinical trial, when patients were matched on a number of target conditions and risks for functional decline at baseline, the intervention resulted in a significant beneficial effect, with a reduction in functional decline (Palmer, 2003). The model is attractive for hospitals that employ advanced practice nurses and have a high-risk (i.e., frail) patient population. The training of resource nurses has been fostered by the program Nurses Improving Care for Health System Elders (NICHE). In addition, NICHE has created a variety of "tools" for nurses to improve geriatric care.

Hospital Elder Life Program (HELP)

The goal of HELP is to prevent incident delirium. Patients at risk for incident delirium are identified shortly after hospital admission, using the Confusion Assessment Method (Inouye et al., 1999). An array of protocols targeted at specific risk factors (e.g., sensory deprivation, cognitive impairment) serve to optimize cognitive function (e.g., reorientation, therapeutic activities), prevent sleep deprivation (e.g., relaxation, noise reduction), avoid immobility (e.g.., ambulation, exercises), improve vision (e.g., visual aids, illumination), improve hearing (e.g., hearing devices), and treat dehydration (e.g., volume repletion). The HELP program employs volunteers and activities coordinators. A clinical trial of intervention protocols targeted at risk factors for delirium resulted in a 40% reduction in the incidence of delirium but had no significant effect on the severity of delirium or on recurrence rates. The intervention is cost-effective when targeted at patients at moderate risk for delirium. Components of the intervention are inexpensive and are easily incorporated into standard medical and nursing care in most hospitals. Dissemination of the HELP program is occurring throughout the United States with close fidelity to the original model.

Transitional Care Interventions

Transitional care begins with comprehensive discharge planning by an advanced practice nurse who identifies vulnerable elderly patients and coordinates discharge plans with physicians and other health professionals. In one model of care, an advanced practice nurse implements comprehensive discharge planning for patients with common diagnoses, conducts short-term home care, maintains close collaboration with the patient's attending physician, provides patient/caregiver education in hospital and home, and remains available by telephone following the patient's discharge to home. The intervention reduced readmissions at 24 weeks, increased time to first readmission, and reduced reimbursements (costs) of health services but had no effect on functional status at 24 weeks (Naylor et al., 1999).

Comprehensive discharge planning plus postdischarge support may reduce readmission rates for older patients with congestive heart failure (CHF). In a meta-analysis of 18 clinical trials, comprehensive discharge planning plus postdischarge support for older patients with CHF significantly reduced readmission rates and appeared to improve health outcomes such as survival and quality of life, without increasing costs (Phillips et al., 2004). Although the interventions vary among the sites, most include an advanced practice nurse working in close collaboration with physicians and an extensive patient and family caregiver education regarding CHF and adherence to diet and medications.

A care transitions intervention is a promising program designed to prepare patients and caregivers to participate in care delivered across health care settings. In a group-model managed-care delivery system, a Transition Coach (e.g., geriatric nurse practitioner) encourages patient self-care, maintains communication with the patient's primary care physician, and teaches patients to manage their medications. In the transition from hospital to home, they help the patient create a personal health record and an interventions activities checklist, and they make telephone calls to reinforce their teaching to patients. In a pilot study, the transitions coach helped to reduce rates of hospital readmission and rates of return visits to the emergency department. Patients also had greater self-confidence to manage self-care (Coleman et al., 2004).

Stroke Units

Meta-analyses of stroke-unit studies demonstrate reduced rates of patient mortality, institutionalization, and functional dependency in comparison with general medical wards (Palmer, 2003). An interdisciplinary team comprising the patient's physician, social worker, physical and occupational therapists, speech therapist, and neurologist uses a systematic approach to enhance patient recovery after admission and begin diagnostic and rehabilitative services. Some stroke units include a geriatrician on the team or are based on an ACE unit.

Postacute Services

Closely aligned to the acute-care hospital, postacute services include subacute units, skilled nursing facilities, geriatric evaluation and management (GEM) units, and in-patient rehabilitation hospitals. Subacute units are skilled nursing facilities (SNF) that provide short-term, goal-oriented, and intensive rehabilitative or skilled nursing services. Medicare patients are often transferred to subacute units of SNF for continuing care after their clinical status has been stable for at least 72 hours in the hospital. Patients with Medicare-managed care benefits can be admitted directly to the SNF or subacute unit from the community. Rehabilitation hospitals are appropriate sites for patients with a categorical illness (e.g., hip fracture, acute stroke) who can tolerate physical therapy and are likely to return to community residence. In Veterans Affairs hospitals, elderly patients who remain functionally impaired following admission to an acute-care hospital might be eligible for transfer to a GEM unit for further assessment and rehabilitation.

Emergency Departments

Older patients who present to the emergency department (ED) often have functional impairments and multiple co-morbidities that leave them vulnerable to functional decline and a loss of physical independence. Observation or clinical decision units in EDs allow elderly patients to be monitored or evaluated for less than 24 hours before being admitted to the hospital or discharged to home. Observation units are a feasible alternative to hospitalization for patients with conditions such as chest pain and asthma. Patients at risk for functional decline, repeated ED or hospital admissions, or nursing-home placement can be identified in the ED by use of screening tools, but evidence of improved clinical outcomes is uncertain (Palmer, 2003).

Current Trends

As financial incentives to reduce the costs of care and improve quality grow, the acute-care hospital is evolving into an integrated health system in which the most cost-effective services are applied to targeted patients in various subsystems of care. The current patchwork of largely uncoordinated subsystems of care is gradually becoming coordinated across specialty areas in a system designed to contain costs, and to optimize efficiency and clinical outcomes. The subsystems of geriatric care in a growing number of medical centers include acute-care units (e.g., ACE, GEM, HELP, stroke), subacute units, and short-stay observation units. Additional services are growing more evident, such as case management by advanced practice nurses for vulnerable elderly patients, NICHE protocols on medical and surgical units, and interdisciplinary assessment and coordination of discharge planning throughout the hospital. Increasingly, these services are complemented by closely aligned services, including home care, palliative care, day hospitals or outpatient treatment centers, and improved medical information systems. As financial concerns regarding the costs of hospitalization increase and alternatives to acute hospital care become more available, the acute hospitalization of elderly patients is becoming shorter and increasingly reserved for those who cannot be cared for in a less intensive environment or when invasive diagnostic or therapeutic procedures are required. With greater numbers of elderly, complex patients being admitted to hospitals, interdisciplinary care and health care education are recognized priorities for the provision of quality geriatric services.

Robert M. Palmer

See also

Case Management
Clinical Pathways
Discharge Planning
Geriatric Evaluation and Management Units
Geriatric Resource Nurse
Home-Health Care
Hospital Elder Life Program (HELP)

Internet Resources

Acute Care for Elders (ACE)
http://aceunitforum.summahealth.org/Index/Index.aspx

Hospital Elder Life Program
http://elderlife.med.yale.edu/public/public-main.php

National Center for Health Statistics
http://www.cdc.gov/nchs

National Chronic Care Consortium
http://www.ncccresourcecenter.org

Nurses Improving Care for Health System Elders (NICHE)
http://www.hartfordign.org/programs/niche/index.html

Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project
http://hcup.ahrq.gov/HCUPnet.asp

2005 White House Conference on Aging, Final Report
http://www.americangeriatrics.org/policy/WHCoAMiniConf_090705.pdf

REFERENCES

Coleman, E. A., Smith, J. D., Frank, J. C., Min, S. J., Parry, C., & Kramer, A. M. (2004). Preparing patients and caregivers to participate in care delivered across settings: The Care Transitions Intervention. *Journal of the American Geriatrics Society*, *52*, 1817–1825.

Counsell, S. R., Holder, C. M., Liebenauer, L. L., Palmer, R. M., Fortinsky, R. H., Kresevic, D. M., et al. (2000). Effects of a multicomponent intervention on functional outcomes and process of care in hospitalized older patients: A randomized controlled trial of acute care for elders (ACE) in a community hospital. *Journal of the American Geriatrics Society*, *48*, 1572–1581.

Inouye, S. K., Bogardus, S. T., Jr., Charpentier, P. A., Leo-Summers, L., Acampora, D., Holford, T. R., et al. (1999). A multicomponent intervention to prevent delirium in hospitalized older patients. *New England Journal of Medicine*, *340*, 669–676.

Kozak, L. J., Lees, K. A, & DeFrances, C. (2006). National Hospital Discharge Survey. *Vital Health Statistics 13*(160), 1–206.

Landefeld, C. S., Palmer, R. M., Kresevic, D. M., Fortinsky, R. H., & Kowal, J. (1995). A randomized trial of care in a hospital medical unit especially designed to improve the functional outcomes of acutely ill older patients. *New England Journal of Medicine*, *332*, 1338–1344.

Naylor, M. D., Brooten, D., Campbell, R., Jacobsen, B. S., Mezey, M. D., Pauly, M. V., et al. (1999). Comprehensive discharge planning and home follow-up of hospitalized elders: A randomized clinical trial. *Journal of the American Medical Association*, *281*, 613–620.

Palmer, R. M. (2003). Acute Hospital Care. In C. Cassel, H. J. Cohen, E. B. Larson, D. Meier, N. M. Resnick, L. Rubenstein, & L. B. Sorenson (Eds.), *Geriatric Medicine* (4th Ed.), New York: Springer-Verlag.

Phillips, C. O., Wright, S. M., Kern, D. E., Singa, R. M., Shepperd, S., & Rubin, H. R. (2004). Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure: A meta-analysis. *Journal of the American Medical Association*, *291*, 1358–1367.

HOSPITAL ELDER LIFE PROGRAM (HELP)

The Hospital Elder Life Program (HELP) is a unique, multidisciplinary approach to caring for older hospitalized patients at risk for delirium or functional decline, with proven effectiveness and cost-effectiveness. HELP was tested in a clinical trial, the Yale Delirium Prevention Trial, involving 852 patients aged 70 and older. One-half received the HELP intervention, the remainder received usual hospital care. The intervention resulted in a 40% reduction in the incidence of delirium (Inouye et al., 1999).

A key feature of the program is that it does not rely on a dedicated unit of the hospital. The program can be integrated into usual care on any hospital unit and is designed to deliver geriatric expertise throughout the institution, thereby broadening its impact to a larger percentage of patients. Goals of the program are (1) to maintain physical and cognitive functioning throughout hospitalization, (2) to maximize independence at discharge, (3) to assist with the transition from hospital to home, and (4) to prevent unplanned readmission.

Program Description

Enrollment and Patient Selection

Upon admission, older patients (i.e., 70 years and older) are screened for six delirium risk factors: cognitive impairment, sleep deprivation, immobility, dehydration, and vision or hearing impairment. Interventions targeted toward these risk factors are implemented by the HELP team and are tracked for adherence.

HELP Team Roles and Responsibilities

Elder Life Nurse Specialist (ELNS)

The ELNS is a masters-prepared nurse with experience and knowledge in geriatrics. The ELNS performs patient assessments and interventions using standardized protocols targeted at geriatric care issues, such as cognitive impairment, immobility, psychoactive medication use, and dehydration. The ELNS also serves as an educational resource for nursing staff and other hospital staff via daily rounds and regular inservices. The ELNS acts as a liaison between the HELP program and hospital staff, communicating HELP recommendations and ensuring follow-up.

Elder Life Specialist (ELS)

The ELS is a unique role created for HELP. Preferable background requirements include a bachelor's degree in human services or a health care–related field, and previous experience working with older patients. The ELS screens and enrolls patients into the program, trains and supervises volunteers, and develops care plans for volunteer interventions. Whereas the care plans are individualized to each patient's risk factors for delirium and functional decline, the interventions consist of standardized protocols. The ELS oversees the volunteers and the day-to-day operations of the program.

Geriatrician

The HELP geriatrician participates in HELP interdisciplinary rounds and provides medical expertise and backup for HELP staff. The geriatrician may serve as program director, but this role may also be played by the ELNS, ELS, or other HELP team members.

Volunteers: Selection, Training, and Assignment

Volunteers are recruited and screened for characteristics such as maturity, respect for older patients, and enthusiasm. A time commitment of at least 6 months is also required. Volunteer training is extensive and encompasses a minimum of 16 hours of classroom learning, 16 hours of one-on-one training on the nursing units, and competency-based checklists for all volunteer interventions. These interventions include daily visits with orienting techniques, therapeutic activities, early mobilization, vision and hearing enhancement, oral volume repletion, feeding assistance, and sleep-enhancement protocols.

After completing training, volunteers are assigned regular "shifts." During a shift, volunteers receive assignments indicating which patients to see and what interventions to perform. Throughout the shift, they may elicit feedback and support from HELP staff (primarily the ELS), other volunteers, or hospital staff. All interventions are tracked for adherence.

Interdisciplinary Expertise

The HELP program conducts twice-weekly interdisciplinary care rounds on all HELP patients. In addition to the HELP staff, participants include primary nurses and physicians, rehabilitation therapy (i.e., physical, occupational, and speech therapy), clinical pharmacy, nutrition, chaplaincy, social work, and discharge-planning services. The input of all clinicians and other health care providers is extremely valuable in achieving individual patients' and overall HELP goals.

Outcomes and Benefits

Acute Care

HELP has been demonstrated to be both effective and cost-effective. Cognitive and functional status is reevaluated and compared to scores from admission. In addition to preventing delirium, HELP also prevents functional decline. In the Yale Delirium Prevention Trial, 14% of intervention patients had a decline in functional status versus 33% in usual care patients (Inouye, Bogardus, Baker, Leo-Summers, & Cooney, 2000). Program costs have also been examined, and the program is cost-effective, with average cost savings of $831 per intermediate risk patient. The costs of implementing the program were more than offset by the cost savings from the program (Rizzo et al., 2001).

Long-Term Nursing-Home Services

Leslie et al. (2005) followed patients in the Yale Delirium Prevention Trial for 1 year after discharge. Although the intervention had no effect on the likelihood of receiving long-term nursing-home care, it was associated with a 15.7% decrease in long-term nursing-home costs, and average savings of $9,446 per long-term nursing-home patient.

Additional Program Benefits

HELP incorporates practical, hands-on patient interventions with geriatric-focused oversight, resulting in improved quality of care of hospitalized older patients and improved patient and family satisfaction with care. Close communication among patients, families, and caregivers allows changes in a patient's status to be addressed almost immediately. The use of volunteers is cost-effective, and patients and staff relate well to the human element they provide. HELP also plays an important role in improving nursing job satisfaction, retention, and skill in caring for older persons.

HELP serves as an important geriatric educational and training site across multiple health care disciplines. The program raises visibility for geriatrics, often bringing awards, commendations, and widespread recognition to affiliated hospitals as a geriatric center of excellence. HELP also assists with community outreach, thereby improving public relations.

Dissemination

The program continues to be actively disseminated worldwide, and there are currently more than 50 active sites in the United States, Canada, and Australia. Implementation of the HELP program is rewarding but can also be challenging. Whereas some hospitals have implemented the program in its entirety, others have implemented certain components and/or have made adaptations. Caution is recommended with adaptations because effectiveness of HELP is directly related to adherence with the interventions protocols (Inouye, Bogardus, Williams, Leo-Summers, & Agostini, 2003). Adaptations must be evaluated for effectiveness.

Staff from nine hospitals who implemented HELP were asked to describe challenges faced while executing the program (Bradley, Schlesinger, Webster, Baker, & Inouye, 2004). Challenges included gaining internal support for the program despite differing requirements and goals of administration and clinical staff, ensuring effective clinician leadership, integrating with existing geriatric programs, balancing program fidelity with hospital-specific circumstances, documenting and publicizing positive outcomes, and maintaining the momentum of implementation in the face of unrealistic time frames and limited resources. Different strategies to address these challenges were identified, including the importance of identifying a clinical leader to champion the implementation process.

In a subsequent study (Bradley, Webster, Baker, Schlesinger, & Inouye, 2005), key aspects that influence sustainability of the program were examined. Staff from 13 hospitals implementing HELP were interviewed, and three critical factors in sustaining the program over time were identified: (1) the presence of clinical leadership, (2) the ability to adapt the program to suit hospital-specific circumstances, and (3) maintaining adequate resources and funding.

The Hospital Elder Life Program is a successful program that prevents delirium and functional decline in the acute-care setting. Geriatric professionals form the backbone of the program, assisted by trained, dedicated volunteers. At-risk patients are identified early in the hospital stay and receive targeted interventions that are part of standardized protocols. All interventions are tracked for adherence, and each patient's outcomes are recorded and evaluated. The HELP model provides the means to improve the quality and effectiveness of hospital care for older persons and prepares our health care system to cope with our aging society.

JANE A. MCDOWELL
SHARON K. INOUYE

See also

Delerium
Geriatric Consultation
Geriatric Evaluation and Management Units
Hospital-Based Services
Nurses Improving Care to Health System Elders (NICHE)

Internet Resources

The Hospital Elder Life Program
www.hospitalelderlifeprogram.org

Confusion Assessment Method (CAM) Training Manual: Go to HELP Web site listed previously; tab "For Clinicians," then "Useful Websites."

National Quality Measures Clearinghouse
www.qualitymeasures.ahrq.gov/summary/summary.aspx?doc_id=369&string=Delirium

REFERENCES

Bradley, E. H., Schlesinger, M., Webster, T. R., Baker, D., & Inouye, S. K. (2004). Translating research into clinical practice: Making change happen. *Journal of the American Geriatrics Society*, *52*, 1875–1882.

Bradley, E. H., Webster, T. R., Baker, D., Schlesinger, M., & Inouye, S. K. (2005). After adoption: Sustaining the innovation. A case study of disseminating the Hospital Elder Life Program. *Journal of the American Geriatrics Society*, *53*, 1455–1461.

Hatlebakk, J. G., & Berstad, A., (1997). Lansoprazole 15 and 30 mg daily in maintaining healing and symptom relief in patients with reflux oesophagitis. *Alimentary Pharmacology & Therapeutics*, *11*(2), 365–372.

Inouye, S. K., Bogardus, S. T., Baker, D. I., Leo-Summers, L., & Cooney, L. M. (2000). The Hospital Elder Life Program: A model of care to prevent cognitive and functional decline in older hospitalized patients. *Journal of the American Geriatrics Society*, *48*, 1697–1706.

Inouye, S. K., Bogardus, S. T., Charpentier, P. A., Leo-Summers, L., Acampora, D., Holford, T. R., et al. (1999). A multicomponent intervention to prevent delirium in hospitalized older patients. *The New England Journal of Medicine*, *340*, 669–676.

Inouye, S K., Bogardus, S. T., Williams, C. S., Leo-Summers, L., & Agostini, J. (2003). The role of adherence on the effectiveness of nonpharmacologic interventions: Evidence from the Delirium Prevention Trial. *Archives of Internal Medicine*, *163*, 958–964.

Leslie, D. L., Zhang, Y., Bogardus, S. T., Holford, T. R., Leo-Summers, L. S., & Inouye, S. K. (2005). Consequences of preventing delirium in hospitalized older adults on nursing home costs. *Journal of the American Geriatrics Society*, *53*, 405–409.

Rizzo, J. A., Bogardus, S. T., Leo-Summers, L., Williams, C. S., Acampora, D., & Inouye, S. K. (2001). Multicomponent targeted intervention to prevent delirium in hospitalized older patients: What is the economic value? *Medical Care*, *39*, 740–752.

HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND AIDS

HIV was first described in young gay White men in the early 1980s. In the subsequent 25 years, the demographics of this epidemic have shifted as increasing numbers of women and minorities have become infected. Older adults have consistently accounted for a significant portion of those infected with HIV. As effective medications allow patients to live longer, the number of elderly patients with HIV continues to grow. Between 1995 and 2003, the cumulative number of AIDS cases in this country rose from 513,000 to 930,000, with patients older than the age of 55 representing approximately 6% of those cases. As of 2003, the cumulative total of AIDS cases in those older than 50 years old was 59,000, and the cumulative total of deaths in this group was 46,000 (Glynn & Rhodes, 2005). Many patients with HIV are undiagnosed; statistics therefore underestimate the actual numbers of those infected. As the population ages, the number of elderly adults infected with HIV will increase. It is estimated that in 2002 the people older than the age of 65 comprised 7% of the world's population, and projections suggest that by 2050 that percentage will increase to 17%. HIV must not remain a silent epidemic among this population.

Regional statistics suggest higher percentages of elders with AIDS in epicenters of the disease, especially in New York City, Los Angeles, and San Francisco. During the 1990s, newly diagnosed AIDS cases in New York City increased 15% in adults older than 50 and 11% in adults 60 or older. These rate increases are markedly higher than the national average of 3% to 5% for those age groups.

Older adults acquire HIV through the same risk factors as younger patients, although there has been a notable shift in risk factors for older adults since the 1980s. Adults older than 50 receive 70% of blood transfusions, and until screening of the blood supply began in 1985, transfusion was a major risk factor for infection in the elderly. In 1987, blood transfusion was the only risk factor in 50% of people older than the age of 65 diagnosed with HIV. By 1993, it accounted for only 19% of those infections. Effective screening has all but eliminated blood transfusions as a risk factor for new infections in this country and, currently, sexual transmission is the most common risk factor among the elderly. Active or former intravenous drug use is also a risk.

Awareness of the risk of HIV transmission is important for older adults and their care providers. Many older adults are not aware that they or their partners are at risk from prior exposure or from a current relationship. Some older adults may not be willing to discuss their previous drug use, or their sexuality, due to stigma or denial. Older women may be particularly uncomfortable discussing their sex lives. For many, condom use was never a common practice and may be viewed as too awkward or difficult to manage. At the same time, an estimated 90% of older individuals with an acknowledged risk for HIV have never been tested for the virus.

Educational programs about HIV risk factors have not targeted the elderly as a risk group. Older patients may fail to self-identify or be completely unaware of possible risks. HIV has become a "silent epidemic" in this population. Once diagnosed, patients may be embarrassed or ashamed and may deal with their disease in isolation. They may be reluctant to discuss their illness with their sexual partners or their families. They may also avoid disclosing their diagnosis to other providers such as their dermatologist, podiatrist, or gynecologist – all of whom should know so that universal precautions can be reinforced.

Some have likened HIV to syphilis as "the great imitator" because it has many signs and symptoms that can mislead or delay diagnosis. HIV can present in myriad ways and in elderly patients, particularly those with other co-morbidities, HIV may not even be a consideration. In the later stages, HIV can present with weight loss, anemia or thrombocytopenia, dementia or other neurological problems, pneumonia, hair loss, or simple fatigue. Any of these complaints can be ascribed to other illnesses or can be associated with phenomena of aging, but providers must consider and treat all etiologies, including AIDS.

Ageism contributes to delay in diagnosis of HIV infection in older adults. Because of this delay, when older adults are diagnosed with HIV, they are frequently at a later stage of their disease than younger adults. It is estimated that 25% of people 55 and older who are diagnosed with HIV die within 12 months (Centers for Disease Control and Prevention Surveillance, 2004). With appropriate care and treatment, more than 50% of adults live more than 5 years after diagnosis.

Advancing age can exacerbate or accelerate the course of HIV infection, as ageing is associated with a decline in humoral and cellular immune function. HIV can accelerate this decline. Elderly patients may have diabetes or renal insufficiency, which can adversely affect immune function. In addition, some patients may be co-infected with hepatitis C. It is well recognized that HIV contributes to earlier progression of fibrosis in the liver in patients with both infections. Osteopenia and mitochondrial toxicity are both consequences of aging and occur in HIV as well. HIV-positive patients who take nucleoside reverse transcriptase inhibitors for extended periods are vulnerable to the effects of mitochondrial toxicity, which include impaired organ function and chronic fatigue.

There are no specific treatment recommendations geared toward older patients infected with HIV. The general recommendations apply to adults of all ages. Particular doses and medication combinations have not been rigorously evaluated in elderly patients but available antiviral medications are equally effective in older patients. Treatment of HIV in this population can be complicated by concomitant treatments of other chronic conditions (Cirelli, 2002). Drug-drug interactions are an ongoing aspect of HIV therapy in all patients.

Chronic liver disease and renal insufficiency are also factors in calculating medication dosage for an effective and safe regimen. For patients with hypertension, cardiovascular disease, diabetes, or other chronic medical conditions, the addition of antiretroviral therapy can be challenging for both physician and patient. Hormone replacement therapy for perimenopausal symptoms and anticoagulants are examples of common chronic therapeutic regimens that require dosage adjustment when combined with antiretrovirals. Medications used to prophylax against certain HIV-related illnesses or the treatment of ongoing conditions such as *Mycobacterium avium* in advanced HIV disease further complicate regimens (Cirelli, 2002).

Preventive care for older adults infected with HIV includes the same recommendations as uninfected elderly patients, with a few additions. All older adults are advised to have yearly influenza vaccine and timely vaccinations against pneumococcal pneumonia. Hepatitis vaccines are recommended. In HIV patients, additional recommendations include a tetanus booster, an annual PPD (without anergy panel), and a regular ophthalmologic exam. Women should have yearly Pap smears. Everyone should have regular dental checkups as well. Recommendations for patients of any age and any health status include good nutrition, regular exercise, enough sleep, smoking cessation, limited alcohol intake, and elimination of recreational drug use.

Care and treatment of all patients with HIV/AIDS require a multidisciplinary approach combining medical, nursing, nutritional, social service, and mental health support. Patients should be referred to an HIV specialist at the time of diagnosis. Case management should facilitate access to appropriate benefits that cover medications, nutritional support, social services, mental health services and, where appropriate, physical therapy and spiritual supports. HIV care providers often have multidisciplinary resources that allow them to network for specific patient needs. It is essential that all providers, including pharmacists, communicate with one another, especially in cases where patients have complicated medical problems involving more than one subspecialty and multiple therapeutic regimens (McMahon, 2003).

HIV is a treatable although not yet curable disease. When older adults are infected, they may need services from many different branches of the health care system. The physical and psychosocial burden of HIV on the elderly population requires special attention and awareness in order to best care for patients.

SUSAN C. BALL

See also

Coping With Chronic Illness

Internet Resources

The Body: The Complete HIV/AIDS Resource
www.thebody.com

Centers for Disease Control and Prevention
www.cdc.gov/hiv

Health Resources and Services Administration: HIV/AIDS Bureau
www.hab.hrsa.gov/

Medscape
www.medscape.com

National Association on HIV Over Fifty (NAHOF)
www.hivoverfifty.org

REFERENCES

Centers for Disease Control and Prevention (2004). *HIV/AIDS Surveillance Report, 2004*. Vol. 16. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005. Available at http://www.cdc.gov/hiv/stats/hasrlink.htm

Cirelli, S. T. (2002). HIV in the Elderly. In *HIV/AIDS Primary Care Guide*, Florida AIDS Education and Training Center, University of Florida (pp. 391–394).

Glynn, M., & Rhodes, P. (2005). Estimated HIV prevalence in the United States at the end of 2003. National HIV Prevention Conference, Atlanta. Abstract 595.

McMahon, E. (2003). The older homosexual: Current concepts of lesbian, gay, bisexual, and transgender older Americans. *Clinics in Geriatric Medicine*, *19*, 587–593.

HYPERTENSION

Hypertension is defined as a systolic blood pressure greater than or equal to 140 or a diastolic blood pressure greater than or equal to 90. Isolated systolic hypertension is an elevated systolic blood pressure in the absence of an elevated diastolic blood pressure. The incidence of hypertension increases with age, affecting 7% of those ages 18 to 39, 28% of those age 40 to 59, and 66% or those age 60 and older (Cheung, Ong, Lam, & Lau, 2006). Of those with hypertension, only 61% are treated, with adequate control achieved in only 34% (Cheung et al., 2006). Earlier data demonstrated that persons older than age 60 have even lower control rates of 27% (Hajjar & Kotchen, 2000), despite a reduction in the risk of stroke, cardiovascular events, and heart failure with the treatment of hypertension even in persons age 80 and older (Gueyffier, Bulpitt, Boissel, et al., 1999). With so many people affected and the ability to reduce morbidity proven, hypertension in older adults is an important condition to diagnose and treat.

Isolated Systolic Hypertension

Isolated systolic hypertension is the most common form of hypertension in persons older than 60 (Izzo, Levy, & Black, 2000). With age, large vessels such as the aorta and its branches become increasingly stiff and less compliant due to arteriosclerosis; this process leads to increased systolic blood pressure, widened pulse pressure, and ultimately cardiovascular disease (Izzo et al., 2000). Smaller arterioles do not undergo the same changes and therefore the diastolic blood pressure can remain normal or low (Basile & Meyer, 2005). Epidemiologically, systolic blood pressure is a better guide for the diagnosis, classification, and treatment of hypertension in older individuals (Izzo et al., 2000). Studies have shown that treatment of isolated systolic hypertension can decrease risk of stroke, myocardial infarction, and heart failure (SHEP Cooperative Research Group, 1991).

Evaluation and Diagnosis

Hypertension is often diagnosed on routine screening exams. Many patients are asymptomatic, but some may have vague complaints such as headache, blurred vision, dizziness, lethargy, depression, or confusion. If target-organ damage such as coronary heart disease, stroke, transient ischemic attack, kidney disease, peripheral arterial disease, or retinopathy has occurred, signs or symptoms of these conditions may be present at the initial encounter.

The seventh report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure (2003) (JNC VII) is a guideline for providers in the management of hypertension. In accordance with these guidelines, the initial evaluation is used to assess lifestyle, overall cardiovascular risk, potential identifiable causes of hypertension, and the presence of target-organ damage.

A complete history should be taken and information ascertained about possible secondary causes of high blood pressure. Common medications including antidepressants, nonsteroidal anti-inflammatory drugs, steroids, and oral sympathomimetics such as nasal decongestants may cause elevated blood pressure. Obstructive sleep apnea and obstructive uropathy are especially relevant potential causes of elevated blood pressure in older patients, as well (Basile & Meyer, 2005). Lifestyle factors and habits including tobacco, alcohol, and exercise should be addressed. Pseudohypertension, caused by calcified brachial arteries that fail to collapse with manual sphygmomanometer measurements, may be uncovered in patients who appear resistant to multiple drugs but complain of symptoms of hypotension (Basile & Meyer, 2005). "White-coat hypertension," defined as elevated blood pressure only in the health care setting and normal blood pressure elsewhere, can be detected by ambulatory blood pressure monitoring (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, 2003). It should be suspected if patients give a history of poor tolerance to a wide variety of antihypertensive agents.

During the physical exam, blood pressure should be measured in both arms with a cuff bladder at least 80% of the circumference of the arm. The patient should be allowed at least 5 minutes of rest in a chair with feet on the floor, the arm should be at heart level, and the patient and provider should not be talking. Two separate measurements allow for a more accurate assessment of blood pressure. In older patients, it is also necessary to take measurements in the standing position because of the increased incidence of postural hypotension. If orthostatic hypotension is present, standing blood pressure will need to be used to direct therapy. A diagnosis of hypertension should be based on measurements at two or more separate office visits except in the case of severe elevation (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, 2003).

In addition to blood pressure measurement, the physical exam should include height and weight for calculation of body mass index, fundoscopic exam, auscultation for bruits (carotid, abdominal, femoral), palpation of the thyroid, cardiopulmonary exam, peripheral vascular assessment, and neurologic exam. Appropriate initial tests are an electrocardiogram, urinalysis, assessment of renal function, potassium, calcium, blood glucose, hematocrit, and lipid profile (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, 2003). New onset of severe hypertension, sudden difficulty in controlling blood pressure, or a concerning finding on the history, physical examination, or initial laboratory results should prompt a work-up for secondary causes of hypertension (Basile & Meyer, 2005).

Treatment

Nonpharmacologic Interventions

Lifestyle modifications are the first step in the treatment of hypertension. Effective mechanisms recommended by the JNC VII are weight reduction, dietary sodium restriction, physical activity and limited alcohol consumption. (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, 2003). The goal for weight maintenance is a normal body mass index (weight in kg divided by the square of the height in meters), which is between 18.5 and 24.9. Sodium intake is not to exceed 2.4 grams daily. When appropriate, 30 minutes of regular aerobic activity most days of the week should be encouraged. Consumption of alcohol for men should be limited to 2 drinks daily and for women to 1 drink daily. The DASH (Dietary Approaches to Stop Hypertension) diet, which is rich in fruits, vegetables, and low-fat dairy products and low in total and saturated fat, can lower blood pressure up to 14 mmHg (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, 2003). More details can be found about this diet at the National Heart, Lung, and Blood Institute (http://www.nhlbi.nih.gov/index.htm). Tobacco cessation is also an important component of lifestyle modification that can lower overall cardiovascular risk.

Pharmacologic Intervention

The target of antihypertensive therapy for most patients is a systolic blood pressure less than 140 and a diastolic blood pressure less than 90. In diabetics and patients with chronic kidney disease, the goal is a systolic less than 130 and a diastolic less than 80. In practice, many physicians seek to normalize blood pressure even further. Drugs should be started at half the dose used in younger patients and titrated with caution (Basile & Meyer, 2005).

The generally accepted initial drug of choice for older patients without compelling indications for other therapy is a thiazide diuretic. The rationale is that thiazide diuretics have been used successfully in multiple large randomized controlled trials in patients older than 60 and have been shown to decrease strokes and cardiovascular events (SHEP Cooperative Research Group, 1991; ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group, 2002). However, their side effects must be monitored closely, especially in older patients. Electrolyte imbalances such as hyponatremia and hypokalemia are more common in older patients and should be anticipated. Urinary incontinence may be exacerbated and questions regarding this should be addressed at follow up. Postural hypotension may occur and lead to dizziness, fainting, and falls resulting in serious injury; therefore, it is important to measure standing blood pressure once patients are started on diuretics. Dihydropyridine calcium channel blockers may be an appropriate alternative first-line therapy for persons without other compelling indications and unable to tolerate thiazides because they have also been shown to decrease stroke and cardiovascular events in persons older than age 60 with isolated systolic hypertension (Staessen, Fagard, Thijs, et al., 1997).

At times there are compelling indications, as outlined by the JNC VII, to make other initial choices for blood pressure medications. If ischemic heart disease is present, a β-blocker is often the first drug used. Cardioselective β-blockers are preferred over those that are more lipophilic (more likely to cross the blood-brain barrier), as they are less likely to cause sedation, depression, and sexual dysfunction in older patients (Dickerson & Gibson, 2005). Angiotensin converting enzyme (ACE) inhibitors and aldosterone receptor blockers (ARB) are often indicated for patients with heart failure, diabetes, or chronic kidney disease. In general, these medicines preserve renal function, but in older patients creatinine clearance should be monitored closely as states of dehydration or decompensated heart failure may lead to a precipitous decline (Dickerson & Gibson, 2005). Older male patients with prostatism may benefit from α-blockers (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, 2003). There are other compelling indications and special situations, for which details can be seen at the National Heart, Blood, and Lung Institute's Web site and report on the JNC VII at http://www.nhlbi.nih.gov/guidelines/hypertension/express.pdf.

Patients and caregivers should be educated about the importance of blood pressure control, the prescribed dosing schedule, and possible side effects of medicines prescribed. The ability of patients to afford the medications prescribed is an important aspect of pharmacologic therapy in older persons and should be addressed to facilitate compliance with a pharmacologic regimen. Health care providers must be open to education about prescription drug plans, insurance formularies, generic formulations, and pharmaceutical assistance programs to help patients achieve success with blood pressure control once lifestyle modifications have been maximized.

AMRET T. HAWFIELD

See also

Chest Pain: Noncardiac Causes

Internet Resources

American Academy of Family Physicians
http://www.aafp.org/online/en/home.html

American Heart Association
http://www.americanheart.org

National Heart, Lung, and Blood Institute
http://www.nhlbi.nih.gov

National Kidney Foundation
http://www.kidney.org/

REFERENCES

Basile, J. N., & Meyer, R. P. (2005). Hypertension in the Elderly. In S. Oparil & M. A. Weber (Eds.), *Hypertension: Companion to Brenner & Rector's The Kidney* (pp. 579–586). Philadelphia: Elsevier Saunders.

Cheung, B. M. Y., Ong, K. L., Lam, K. S. L., & Lau, C. (2006). Prevalence, awareness, treatment, and control of hypertension: U.S. National Health and Nutrition Examination Survey 2001–2002. *The Journal of Clinical Hypertension*, 8, 93–98.

Dickerson, L. M., & Gibson, M. V. (2005). Management of hypertension in older persons. *American Family Physician*, *71*, 469–476.

Gueyffier, F., Bulpitt, C., Boissel, J. P., Schron E., Ekbom T., Fagard R., et al. (1999). Antihypertensive drugs in very old people: A subgroup meta-analysis of randomized controlled trials. Indiana Group. *Lancet*, *353*, 793–796.

Hajjar, I., & Kotchen, T. A. (2003). Trends in prevalence, awareness, treatment and control of hypertension in the United States, 1988–2000. *Journal of the American Medical Association*, *290*, 199–206.

Izzo, J. L., Levy, D., & Black, H. R. (2000). Importance of systolic blood pressure in older Americans. *Hypertension*, *35*, 1021–1024.

SHEP Cooperative Research Group (1991). Prevention of stroke by antihypertensive drug treatment in older persons with isolated systolic hypertension. *Journal of the American Medical Association*, *265*, 3255–3264.

Staessen, J. A., Fagard, R., Thijs, L. Celis H, Arabidze GG, Birkenhäger WH, et al. (1997). Randomised double-blind comparison of placebo and active treatment for older patients with isolated systolic hypertension. *Lancet*, *350*, 757–764.

The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group. (2002). Major outcomes in high-risk hypertensive patients randomized to angiotensin-converting enzyme inhibitor or calcium channel blockers vs diuretic. *Journal of the American Medical Association*, *288*, 2981–2997.

The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (2003). The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Journal of the American Medical Association*, 289, 2560–2572.

I

IATROGENESIS

Iatrogenic illness is any illness that results from a diagnostic procedure or therapeutic intervention and is not a natural consequence of the patient's disease. In general, iatrogenic illness is one that results from medication, diagnostic or therapeutic procedures, nosocomial infections, or environmental hazards. A broader definition might include illness resulting from environmental events (e.g., falls), underdiagnosis, undertreatment, or negligence. A recent study found that low mobility and bedrest are common in hospitalized older patients and are important predictors of adverse outcomes, which suggests that that low mobility and bedrest may be viewed as iatrogenic events (i.e., an inappropriate therapeutic "procedure") leading to complications, such as functional decline (Brown, Friedkin, & Inouye, 2004). Older patients are predisposed to iatrogenic illness because of reduced homeostatic reserves, high levels of co-morbid illnesses, and polypharmacy, which increases the probability of adverse drug events.

Most studies of iatrogenesis have been conducted in acute-care hospitals. One study of hospitalized patients age 65 years and older found that 58% suffered at least one iatrogenic complication when hospitalized for 15 or more days. Therapeutic interventions accounted for 44% of complications; diagnostic procedures and errors of omission accounted for approximately 10% each (Riedinger & Robbins, 1998).

A related concept, medical error, is of great national concern. Medical errors happen when something that was planned as a part of medical care does not succeed or when the wrong plan was used in the first place. The Harvard Medical Malpractice Study reported that patients older than age 65 were twice as likely to sustain injury during hospitalization as younger patients and were more likely to suffer from the effects of hospital negligence (Riedinger & Robbins, 1998). Most of the events were considered preventable. The high rates of iatrogenesis, medical error, and negligence reported in hospitalized patients led the Institute of Medicine (IOM) to release a report advocating dramatic, systemwide changes to reduce these rates (Kohn, Corrigan, & Donaldson, 1999). In its report, *To err is human: Building a safer health system*, the IOM estimates that 44,000 to 98,000 Americans die each year not from the medical conditions they checked in with but rather from preventable medical errors. A subsequent publication from the IOM, the *Quality Chasm* report, describes broader quality issues and defines six aims: care should be safe, effective, patient-centered, timely, efficient, and equitable. Hospitals are implementing programs to reduce medical error and to improve patients' safety. One such program, the Patient Safety Improvement Corps, is a partnership program between the Agency for Healthcare Research and Quality and the Veterans Administration. It seeks to improve patient safety by providing knowledge and skills to teams of state field staff and hospital partners selected by states.

Adverse Drug Events

Adverse drug events in hospitalized patients are associated with significantly prolonged lengths of stay, higher costs of care, and increased risk of death. Polypharmacy, inappropriate drug prescribing, and prescribing errors are common preventable causes of iatrogenic illness. Virtually all classes of medications can cause adverse events, but antibiotics and cardiovascular drugs are most commonly implicated in studies of hospitalized patients.

The American Hospital Association lists the following as some common types of medication errors:

- incomplete patient information (e.g., not knowing about patients' allergies, other medicines they are taking, previous diagnoses, and lab results)
- unavailable drug information (e.g., lack of up-to-date warnings)
- miscommunication of drug orders, which can involve poor handwriting, confusion between drugs with similar names, misuse of zeroes and decimal points, confusion of metric and other dosing units, and inappropriate abbreviations
- lack of appropriate labeling as a drug is prepared and repackaged into smaller units
- environmental factors, such as lighting, heat, noise, and interruptions, which can distract health professionals from their medical tasks

The prevention of adverse drug events in elderly hospitalized patients can include a variety of strategies, including guidelines for rational drug-prescribing and the use of electronic medical records with educational supports. The latter have not been proven to prevent iatrogenic illness in elderly patients but offer hope of reducing errors in drug dosing (e.g., by reducing maintenance doses of renally excreted drugs).

Diagnostic and Therapeutic Procedures

Common medical complications of diagnostic studies include anemia from extensive venipunctures, urinary tract infections from bladder catheterizations, and contrast-induced nephropathy. Patients at high risk of contrast nephropathy include those with diabetes mellitus and preexisting renal insufficiency. The patient's hydration should be maintained before and after a diagnostic study is performed with intravenous radiocontrast dyes. Contrast should be avoided if patients have baseline renal insufficiency. When radioconstrast is required (e.g., for coronary arteriography), a low-osmolar agent should be used at the minimal dose necessary, and measurement of the serum creatinine level should be repeated 24 to 48 hours after the administration of the contrast medium. If possible, nonsteroidal anti-inflammatory drugs and diuretics should be withheld before and after exposure to contrast medium (Barrett & Parfey, 2006). Although acetylcysteine has been effective in some studies, its role in reducing the risk of contrast-medium–induced nephropathy and associated morbidity remains uncertain.

Functional decline, delirium, pressure ulcers, and trauma (e.g., falls) may occur because of inadequate processes of care or poor environmental conditions. Pneumothorax and hematomas from arterial lines placed during surgical or invasive procedures have been reported in hospitalized patients and should be considered carefully before performing the procedure. Complications of immobility, including physical disability and pressure ulcers, are potentially preventable through greater attention to patient mobility, exercise, avoidance of physical restraints, and interdisciplinary care. Patients should be assessed for risk of pressure ulcers, with attention to nutritional repletion, mobility, and skin lubrication to reduce incidence.

Standardized protocols can improve surgical outcomes. Attention to blood pressure regulation, oxygen supplementation, and the avoidance of anticholinergic agents in the perioperative period appear to reduce the incidence of postoperative delirium. Anticoagulation with either low-molecular-weight or unfractionated heparins or the use of leg-compression devices reduces the incidence of venous thrombosis in elderly patients undergoing elective or emergent hip or knee surgery (Saint & Matthay, 1998).

Nosocomial Infections

Nosocomial, or hospital-acquired, infections are common causes of iatrogenic illness in both hospitalized and institutionalized elderly patients; they increase the length of stay and the costs of hospitalization and increase overall morbidity and mortality (Riedinger & Robbins, 1998). Common nosocomial infections are those of the urinary tract, those related to intravascular catheters, and pneumonia. Skin (e.g., methicillin-resistant *Staphylococcus aureus*), urinary tract (e.g., vancomycin-resistant *enterococci* [VRE]), oropharyngeal (e.g., *Candida* species), and gastrointestinal (e.g., *Clostridium difficile* colitis) infections are other significant nosocomial infections that are potentially preventable. These organisms have become resistant to usual antibiotics.

Bacterial resistance to usual antibiotic therapy results from interaction among microorganisms, patients, antibiotics, and infection-control practices. Factors that contribute to antibiotic resistance are frequent prescribing of antibiotics, intrainstitutional transmission of resistant bacteria by cross-colonization of patients due to poor handwashing practices of health care workers, and transfer of colonized patients between institutions. The emergence of VRE has been carefully studied. Colonization and infection with VRE have been associated with exposure to antibiotics that are active against anaerobes (Donskey et al., 2000). Also, VRE are likely transmitted from patient to patient by the unwashed hands of health care workers or contaminated medical equipment or environmental surfaces (e.g., mattresses, bed rails, telephones, blood pressure cuffs, doorknobs). Infection and antibiotic control procedures, including restriction of vancomycin use, better selection of empirical antibiotics, education of hospital personnel, early detection and reporting of vancomycin resistance, isolation of colonized patients, and appropriate cleansing of the environment, may prevent the spread of VRE in health care settings. Cleansing patients with chlorhexidine-saturated cloths reduces VRE contamination of patients' skin and, in turn, the environment and health care workers' hands (Vernon, Hayden, Trick, Blom, & Weinstein, 2006).

Resistant urinary tract infections are common in elderly patients following prolonged indwelling urinary catheterization. The incidence of infection increases by approximately 5% per day, although the rate of bacteremia (i.e., urosepsis) is lower. Chronic catheter use should be limited to patients with incurable urinary retention who cannot be kept clean and dry with standard nursing measures. Patients who are critically ill, in whom precise measurement of urine output is important, are candidates for temporary catheter placement. However, urinary-incontinence protocols that include indications for appropriate catheter use and removal can help ensure that catheters do not remain in place longer than necessary. Prophylactic antimicrobial therapies and routine catheter replacement are not recommended.

Nosocomial pneumonia results from colonization of the upper respiratory and gastrointestinal tracts and occurs most often in critically ill patients who are ventilator-dependent. Factors promoting nosocomial pneumonia include gastric aspiration, spread of pathogens on the hands of medical and nursing personnel, fecal-oral spread of pathogens, and cross-contamination from other patients. Infections with gram-negative bacteria, notably *Pseudomonas* species, are common. Prevention includes proper cleaning of respiratory equipment at timely intervals, consistent handwashing between patient contacts, cleaning of mechanical equipment (e.g., stethoscopes) between patient contacts, and maintaining the patient in a semiupright position to minimize the risk of gastric aspiration.

Intravascular infections, most often related to central intravenous or intra-arterial lines, are associated with duration and site of catheter use. To reduce the risk of infection, the patient's skin should be disinfected with chlorhexidine gluconate before catheterization, triple-lumen catheters impregnated with antimicrobial agents (Hanna et al., 2003) should be used when a multilumen catheter is necessary, and the line should be removed when there is clinical evidence of infection from the catheter (Saint & Matthay, 1998).

Environmental Hazards

The physical environment of the hospital can contribute to the risk of iatrogenic illness. Most older hospitals were not designed to foster the independent functioning of older patients. Shiny and slippery-appearing floors can discourage walking, various tethers such as physical restraints and intravenous lines can limit mobility, and the noise and frequent interruptions of meals and sleep can increase the risks of delirium, falls, and functional decline. Aspects of the physical environment should be modified to reduce the potential for an iatrogenic event while enhancing the patient's independent functioning in activities of daily living and mobility. Desirable features of the environment include clutter-free corridors equipped with handrails, carpets in hallways and rooms, diffuse lighting, quiet rooms at night, appropriate signage, and grab bars in bathrooms. Physical barriers to patient mobility, including restraints, should be minimized and unnecessary physical restraints avoided.

ROBERT M. PALMER

See also

Environmental Modifications: Home, Institutional
Infection Transmission in Institutions: Pneumococcal Pneumonia
Over-the-Counter Drugs and Self-Medication
Polypharmacy: Drug-Drug Interactions
Polypharmacy Management
Pressure Ulcer Risk Assessment
Restraints
Signage
Urinary Tract Infections

Internet Resources

Agency for Healthcare Research and Quality: Medical Errors and Patient Safety
http://www.ahrq.gov/qual/errorsix.htm

CDC Guidelines on Prevention of Healthcare-Associated Infections, Including Nosocomial Pneumonia
http://www.cdc.gov/ncidod/dhqp/guidelines.html

Institute of Medicine: Crossing the Quality Chasm
http://www.iom.edu/CMS/8089.aspx

National Coalition on Health Care: Reducing Medical Errors and Improving Patient Safety
http://www.nchc.org/releases/medical_errors.pdf

National Guideline Clearinghouse
http://www.guideline.gov

The Patient Safety Improvement Corps
http://www.ahrq.gov/about/psimpcorps.htm

The Role of the Physical Environment in the Hospital of the 21st Century
http://www.healthdesign.org/research/reports/physical_environ.php

REFERENCES

Barrett, B. J., & Parfey, P. S. (2006). Preventing nephropathy induced by contrast. *New England Journal of Medicine*, *354*, 379–386.

Brown, C. J., Friedkin, R. J., & Inouye, S. K. (2004). Prevalence and outcomes of low mobility in hospitalized older patients. *Journal of the American Geriatrics Society*, *52*, 1263–1270.

Donskey, C. J., Chowdhry, T. K., Hecker, M. T., Hoyen, C. K., Hanrahan, J. A., Hujer, A. M., et al. (2000). Effect of antibiotic therapy on the density of vancomycin-resistant *enterococci* in the stool of colonized patients. *New England Journal of Medicin*e, *343*, 1925–1932.

Hanna, H. A., Raad, I. I., Hackett, B., Wallace, S. K., Price, K. J., Coyle, D. E., et al. (2003). Antibiotic-impregnated catheters associated with significant decreases in nosocomial and multi-drug resistant bacteremias in critically ill patients. *Chest*, *124*, 1030–1038.

Kohn, L., Corrigan, J., & Donaldson, M. (Eds.). (1999). *To err is human: Building a safer health system. Committee on Quality of Health Care in America, Institute of Medicine.* Wahington, DC: National Academy Press.

Riedinger, J. L., & Robbins, L. J. (1998). Prevention of iatrogenic illness: Adverse drug reactions and nosocomial infections in hospitalized older adults. *Clinics in Geriatric Medicine*, *14*(4), 681–698.

Saint, S., & Matthay, M. A. (1998). Risk reduction in the intensive care unit. *American Journal of Medicine*, *105*, 515–523.

Vernon, M. O., Hayden, M. K., Trick, W. E., Blom, R. A., & Weinstein, R. A. (2006). Chlorhexidine gluconate to cleanse patients in a medical intensive care unit: The effectiveness of source control to reduce the burden of vancomycin-resistant *enterococci*. *Archives of Internal Medicine*, 166, 306–312.

IMMIGRANT ELDERS

The World Health Report 2006 set an agenda for the coming decade for individuals and organizations to be culturally competent and responsive in policies and strategies for workforce development. The core message for the coming decade is that health for all is not achievable without an appropriately prepared, deployed, and supported health workforce (World Health Organization, 2006a). Cultural diversity is an important issue among clinicians working with older adults. A recent World Health Organizatin (WHO) statement on ageing and health revealed that in 2000, there were 600 million people aged 60 and older; there will be 1.2 billion by 2025 and 2 billion by 2050 (WHO, 2006b). In addition:

- About two-thirds of all older people are living in the developing world; by 2025, it will be 75%.
- In the developed world, the very old (age 80+) is the fastest growing population group.
- Women outlive men in virtually all societies; consequently, in very old age, the ratio of women:men is 2:1.

Assuming that migration rates remain approximately constant, the number of older adults who migrate is likely to increase. Future projections of aging populations in the United States, Canada, Australia, and across Europe reveal increasing heterogeneity of immigrant elders, and it is anticipated that numbers will increase even more extensively than that of nonimmigrant elders. In Australia, for example, the population is ageing at a fast rate and it is estimated that by 2021, 17.8% of the population will be older than the age of 65 (Australian Bureau of Statistics, 1995). These statistics are similar to Western nations.

Thus, people working in health and human services face two intertwined challenges: how to assist immigrant elders with their health needs; and how, at the same time, to develop the cultural competence skills to meaningfully engage, assess, and treat patients, taking both the challenges and opportunities posed by diversity.

Cultural competence with immigrant elders involves clinical use of a set of behaviors, attributes, and policy infrastructure that come together in a system, organization, or among professionals and enable that system, organization, or those professions to work effectively in cross-cultural situations (Eisenbruch, 2004). Also important will be mobilization of strengths inherent in health systems to improve health and well-being by valuing cultural perspectives.

The importance of cultural competence in clinical elder care is particularly relevant to the management of chronic physical conditions such as diabetes, heart disease, musculoskeletal conditions, and cancer. In each condition, the ability of the provider to create and deliver a specific intervention will depend on cultural competence.

Cultural competence will also go a long way to promote positive health and well-being and reduce suffering. At the same time, a culturally competent approach to immigrant elder care will take into account the nature and scope of family supports through family and community infrastructure, meaningful social interaction, improved nutrition, and moderate physical activity. These factors provide substantial insight into the role of risk and protective factors in the developmental pathways for health problems and illness.

Practical work with immigrant elders requires a service provider to understand the concept of culture, its impact on human behavior, and the interpretation and evaluation of behavior. At the core of engaging immigrant elders in a culturally competent manner will be the need to understand issues such as stigma, isolation, communication and language difficulties, and sensitivity to specific problems and the way they are experienced and understood.

Also significant will be the importance of churches, synagogues, temples, and mosques in the host society. In American society, for example, the creation of an immigrant church or temple often provided ethnic communities with refuge from the hostility and discrimination from the broader society, as well as opportunities for economic mobility and social recognition. In turn, the successive waves of immigrants have probably shaped the character as well as the content of American religious institutions (Hirschman, 2004).

The combined elements of social and interpersonal factors lead practitioners to consider the deeper meaning structures held by immigrant elders. Based on the work of Kleinman & Seeman (2000), this means clinicians must be open to examination of the way in which symptoms of health and illness are understood and presented, the way help is sought, and the way care is evaluated by those who receive it. The clinical work of any health professional—no matter how willing or keen to help—will be compromised if it does not consider the patients' understanding of health difficulties and what practitioners themselves see as differently perceived causes of illness, optimal care, and culturally appropriate support and treatment. This is particularly so in the mental health arena.

Chiriboga, Yee, and Jang (2005) highlight that mental health problems and mental illness for immigrant elders may arrive in circumstances often associated with depression, and their problems can be accentuated by their experience in the new culture.

Isolation

Despite living in the host country for many years, immigrant elders who live in a cultural enclave are more likely to have problems understanding the language of the host country.

Traumatic Stress

Especially for those who had to leave their homelands involuntarily as a result of social and political unrest, personal loss as well as the loss of loved ones may create a context for trauma.

Immigrant elderly also appear to be at risk of social isolation as traditional intergenerational relationships are rapidly disappearing. Urban sprawl results in social dislocation of young and old, without adequate social support measures and extended family in place. If a refugee or displaced person, the immigrant elder is likely to arrive with only a few members of the extended family for support. As time goes on, the elder may also find that younger generations are reluctant to provide the kind of support the elder expects (Chiriboga et al., 2005).

Health professionals providing treatment to people from culturally and linguistically diverse backgrounds in later life should have and display respect for the person's cultural heritage, provide services in her or his preferred language if they are limited in English proficiency, and understand how the cultural background of the client might affect symptom manifestation, significance, and treatment.

Clinical-assessment, health, and helping strategies for immigrant elderly must incorporate personal reflection, therapeutic sensitivity, compassion, and understanding. Effective communication with immigrant elders means that health professionals should ascertain the person's preferred language and whether an interpreter is necessary. Lack of English proficiency should not be assumed to be the result of poor language attainment; it could be associated with dysphasia due to a current or previous stroke or other neuromuscular disease. Care should be individualized to a patient's customs and beliefs, as well as practices regarding health, illness, and death, and patients should be asked what *they believe* is the cause of their problem. The clinician should specifically encourage older patients to talk about any issues, needs, or problems they may be experiencing in the hospital or community setting. Health care professionals should allow each patient to decide the level of family involvement and which additional networks may be available for informal support, such as religious groups or friends.

Assessment of these issues should be interlinked to and used to improve clinical-care situations. Cultural sensitivity should frame how the older person is questioned. Simply asking a question can be an opportunity for the development of a trusting and effective therapeutic relationship. To achieve these aims and ideals, health care professionals must also identify their own prejudices and biases and what are suggested by them. The following questions can guide this reflective process:

- What are my own feelings toward migrants and refugees? Do I work comfortably with those who are distressed and noncommunicative? Do I fear or dislike them? Do they unsettle me? Am I ambivalent toward them and, if so, why?
- How are my ideas, thoughts, and feelings about working with immigrant elders manifested during clinical practice?
- How do media and popular opinion regarding particular immigrant and religious groups shape my views?
- To what extent do I encourage and allow immigrant elderly patients and their families to make decisions about their care?

Perhaps the most challenging aspect of health care practice with immigrant elderly is that they have access to the health care system at the very point of their distress. Nevertheless, from migration to resettlement, health care professionals can assist immigrant elders make sense of an increasingly globalized and at times hostile world, better understand and respond to individual need, develop culturally competent problem-solving abilities, and appreciate the factors that can promote health and comfort. With an informed knowledge base of background issues in the wider world—including the social-political—clinicians, immigrant elders, their families, and significant networks can work together to target strategies and support programs with the goal of maximizing ongoing coping and health choices.

NICHOLAS G. PROCTER

See also

Asian and Pacific Islander American Elders
Cultural Competence and Aging
Hispanic and Latino Elders
Subcontinental Elders

Internet Resources

Multicultural Mental Health Australia
http://www.mmha.org.au/

Queensland Transcultural Mental Health Centre
http://www.health.qld.gov.au/pahospital/qtmhc/default.asp

University of California Department of Medicine
http://medicine.ucsf.edu/resources/guidelines/culture.html

World Health Organization, Ageing and Health
http://www.who.int/topics/ageing/en/

REFERENCES

Australian Bureau of Statistics (1995). *Projections of the populations of Australian States and Territories (1995–2051).* Report No. 3222.0:37. Australian Government, Australian Capital Territory, Canberra.

Chiriboga, D. A., Yee, B. W. K., & Jang, Y. (2005). Minority and cultural issues in late-life depression. *Clinical Psychology: Science and Practice*, *12*(3), 358–363.

Eisenbruch, M. (2004). *The lens of culture, the lens of health: Towards a framework and toolkit for cultural competence.* Resource Document for UNESCO Asia-Pacific Regional Training Workshop on Cultural Mapping and Cultural Diversity Programming Lens to Safeguard Tangible and Intangible Expressions of and Project Cultural Diversity, Bangkok, 15–19 December 2004. Centre for Ethnicity and Health, the University of New South Wales, Sydney, Australia.

Hirschman, C. (2004). The role of religion in the origins and adaptation of immigrant groups in the United States. *International Migration Review*, *38* (3), 1206–1233.

Kleinman, A., & Seeman, D. (2000). Personal experience of illness. In G. L. Albrecht, R. Fitzpatrick, & S. C. Scrimshaw (Eds.). *Handbook of Social Studies in Health and Medicine* (pp. 230–243). London: Sage Publications.

World Health Organization (2006a). The World Health Report 2006: Working Together for Health. Geneva: World Health Organization. Available at http://www.who.int/whr/2006/en/index.html

World Health Organization (2006b). The world is fast ageing: Have we noticed? The time to plan and to act is now. Geneva: World Health Organization. Available at http://www.who.int/ageing/en/

IMMUNIZATION

Prevention of infectious disease is an essential component of primary health care of older adults. Normal age-related changes in the immune system increase elders' risk for infection. Immunization for influenza and pneumococcal pneumonia is strongly encouraged, particularly for elders living in institutions. Table I.1 summarizes recommendations regarding indications and timing for immunizations.

Patient Involvement and Consent

The purpose of immunization should be explained and the patient allowed to accept or reject it. For older adults living in the community, signed consent is occasionally obtained before immunization, but oral consent is acceptable. Nursing-home residents with decisional capacity should participate in the choice whether to be immunized. For those unable to make their own decisions, consent should be obtained from the person holding the elder's health care power of attorney.

Risk Factors

Compliance with recommended immunization guidelines has improved, although the goal set in Healthy People 2010 of 95% adherence to immunization has not been met. To facilitate compliance, the federal government in 2002 approved standing orders for annual influenza vaccinations and pneumococcal pneumonia vaccination for older adults in institutional settings and home health agencies for all Medicare and Medicaid beneficiaries. The most common reasons older adults give for inadequate immunization are lack of knowledge about its importance, not receiving advice to be immunized by their health care providers, reimbursement issues, and fear of side effects (Resnick, 1998). Education about benefits versus risks is essential to help them understand the advisability of vaccinations. It should be explained that vaccines are safe but that one may have mild systemic reactions such as weakness, fever, transient local pain, or reddened skin. As with any drug, there is the rare possibility of a serious anaphylactic reaction. Influenza and pneumonia vaccinations should not be administered to individuals who are allergic to any component of the vaccine or to anyone with an acute infection.

TABLE I.1 Recommended Immunizations for Older Adults

Vaccine	Ages 50 to 64	Ages 65 and older
Tetanus, Diphtheria	1 dose every 10 years	1 dose every 10 years
Influenza	Annual	Annual
Pneumococcal	1 dose	1 dose*

*Revaccinate once after 5 years if the individual has a history of immunodeficiency, leukemia, lymphoma, or a known malignancy; is on alkylating agents or antimetabolites; has a known leakage of cerebrospinal fluid; has had radiation or large amounts of corticosteroids; or has known renal failure, asplenia, or HIV infection. One-time revaccination for those older than 65 who were vaccinated more than 5 years previously and were younger than 65 at the time of the initial vaccination.

Reimbursement

Medicare reimburses providers for the cost of influenza and pneumococcal vaccines. Beneficiaries with Part B coverage can receive the vaccines without co-payment or a deductible. Even though adults older than 60 are at highest risk for tetanus, the Center for Medicaid and Medicare Services (CMS) does not cover tetanus immunizations because there are only about 50 cases reported each year in the United States.

Influenza Vaccine

Approximately 10,000 deaths occur each year because of influenza, with 80% to 90% occurring in the older population. The vaccine is 70% to 80% effective in preventing influenza in the general population but less so in preventing clinical illness among elders (Langley & Faughnan, 2004). The influenza vaccine, however, also reduces the severity of symptoms and is 80% effective in preventing death in elders (Harper, Fukuda, Uyeki, Cox, & Bridges, 2004). Influenza vaccines are reformulated annually and are trivalent (i.e., contain inactivated viruses from three strains: two type A strains and one type B strain). Ideally, the vaccine is given just before the flu season starts. The immune response is delayed for 3 to 4 weeks, and antibody titers decline rapidly.

Pneumococcal Vaccine

Pneumococcal disease is a common cause of hospitalization and death in persons age 65 and older. The polysaccharide pneumococcal vaccine contains materials from the 23 types of pneumococcal bacteria that cause 88% of pneumococcal infections and is effective against 80% to 90% of the known strains of bacteria causing infection (Ansaldi et al., 2005). All high-risk older adults (as defined in Table I.1) should receive an additional pneumococcal vaccination 5 years or more after their first immunization (CDC, 1998). Pneumococcal vaccine can be given at any time during the year. Side effects occur in 50% of recipients but are generally limited to pain, erythema, and swelling at the injection site lasting no longer than 48 hours; fever and myalgia are rare.

Tetanus and Diphtheria

Approximately 84% of elders lack antibodies against diphtheria. The risk of mortality from tetanus or diphtheria is greater than 30%. For older adults who have never been immunized, the tetanus-diphtheria vaccination is indicated. The optimal interval for booster vaccination has not been established. The standard regimen is a booster every 10 years; however, persons born in the United States who received the childhood series of vaccination can have intervals of 15 to 35 years. Neurological reactions and severe hypersensitivity after a previous dose are contraindications for repeat vaccinations.

Hepatitis B

Vaccination is recommended for high-risk patients as described in Table I.1. Older adults, because of the declining efficiency of their immune systems, may not achieve as high a level of antibodies as younger persons.

Hepatitis A

Preexposure immunization for hepatitis A is recommended for individuals at risk of exposure: those who live in or travel to countries where the rate of hepatitis A virus is high, homosexual persons, intravenous drug users, and individuals with liver disease. At this time, data are insufficient with regard to periodic booster immunization.

Varicella

Many adults with no history of chicken pox have immunity to varicella; fewer than 10% of adults in the United States are susceptible to the disease. However, if it is contracted, the disease is more severe than in children. Most clinicians obtain titers and vaccinate if there is an inadequate antibody titer of varicella.

Herpes Zoster

In the summer of 2006, the FDA approved a new vaccine, Zoster Vaccine Live, for the prevention of herpes zoster (shingles) in individuals 60 and older. Currently, this is the only medical option that may prevent shingles, a painful disease that can occur in anyone who has had chicken pox.

Measles (Rubeola), Mumps, and Rubella

For those older than 65, antibody titer and immunization are recommended if there is a significant risk of exposure—for example, grandparents raising young children. Measles and mumps vaccination is recommended for those born after 1956.

BARBARA RESNICK

See also
Morbidity Compression

Internet Resources
American Geriatrics Society
www.americangeriatrics.org/immsched.html

Centers for Disease Control and Prevention
www.cdc.gov/epo/mmwr/mmwr.html

Successful Strategies in Adult Immunization, Centers for Disease Control and Prevention
http://aepo-xdv-www.epo.cdc.gov/wonder/prevguid/p0000239/entire.htm

Tetanus and Diphtheria Health Threats
www.theallineed.com/health/ tetanus_diphtheria_health_threats.htm

REFERENCES

Ansaldi, F., Turello, V., Lai, P., Bastone, G., De Luca, S., Rosselli, R., et al. (2005). Effectiveness of a 23-valent polysaccharide vaccine in preventing pneumonia and non-invasive pneumococcal infection in elderly people: A large-scale retrospective cohort study. *Journal of International Medical Research*, *33*(5), 490–500.

Centers for Disease Control and Prevention (1998). Influenza and pneumococcal vaccination levels among adults aged 65 or over in the United States. *Journal of the American Medical Association*, *280*(21), 1818–1819.

Harper, S. A., Fukuda, K., Uyeki, T. M., Cox, N. J., & Bridges, C. B. (2004). Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP). Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep.; 53(RR-6):1–40. Erratum in MMWR Recomm Rep. 2004 Aug 20, *53*(32), 743. Update in MMWR Recomm Rep. 2005 Jul 29; 54(RR-8), 1–40.

Langley, J. M., & Faughnan, M. E. (2004). Prevention of influenza in the general population. *Canadian Medical Association Journal*, *171*(10), 1503–1510.

Resnick, B. (1998). Health care practices of the old-old. *American Academy Journal of Nurse Practitioners*, *10*, 147–155.

INCONTINENCE

See
Fecal Incontinence
Urinary Incontinence

INFECTION TRANSMISSION IN INSTITUTIONS: PNEUMOCOCCAL PNEUMONIA

Prevention of infections in long-term-care facilities (LTCFs) and other types of chronic-care facilities is a critical component of providing state-of-the-art, compassionate care to the elderly. An overall preventive strategy involves both limiting host factors that predispose to infection (e.g., reducing pressure ulcers, minimizing indwelling bladder catheters, and preventing aspiration of oral secretions and food) and reducing transmission of pathogenic bacteria (e.g., methicillin-resistant *Staphylococcus aureus*).

A major challenge in LTCFs is reducing the rate of respiratory tract infection. Although the focus here is on the prevention of penicillin-resistant *Streptococcus pneumoniae*, the principles apply to the prevention of many different types of infection.

Each year in the United States, pneumococcal disease accounts for approximately 50,000 cases of bacteremia, 3,000 cases of meningitis, 100,000 to 135,000 hospitalizations, and 7 million cases of otitis media. The overall incidence of pneumococcal bacteremia, estimated at 15 to 30 cases per 100,000 people, is higher for persons age 65 years or older (i.e., 50 to 83 cases per 100,000). At least 40,000 patients die from complications of pneumococcal disease each year. The mortality rate for community-acquired pneumonia remains at 12% despite potent antimicrobials, and the mortality rate for meningitis is 35% to 45%.

The pharyngeal colonization rate is 5% to10% of healthy adults and up to 40% in healthy children. Children younger than 2 years of age and adults 65 years of age or older are at highest risk for infection. Also, persons of any age with certain underlying medical conditions (e.g., congestive heart disease, diabetes, emphysema, chronic liver disease, sickle cell disease, post-splenectomy syndromes, chronic lymphocytic leukemia, agammaglobulinemia, or HIV/AIDS) and those living in special environments (e.g., chronic-care facilities) are at increased risk for developing pneumococcal infection. Thus, vaccination against pneumococcal infection is a major priority in LTCF. Unfortunately, this priority is not often met. In a recent study (Chi, Reiber, & Neuzil, 2006), the authors found that pneumococcal vaccination rates were higher for veterans than for nonveterans (i.e., 74% versus 68% and 68% versus 63%, respectively; P <0.001 for both) and for VA users than non-VA users (i.e., 80% versus 72% and 81% versus 64%, respectively; P < 0.001 for both). Despite extensive education efforts, vaccintation rates are still poor.

A major challenge in skilled nursing facilities is the potential emergence of penicillin-resistant pneumococci. The first penicillin-resistant pneumococci were reported in 1967. By 1978, a significant outbreak of multiresistant pneumococci isolate was reported from a children's hospital in South Africa (Jacobs et al., 1978). In a recent study (Hoban, Waites, & Felmingham, 2003), 2,371 isolates from 7 Canadian and 8 U.S. centers were studied. Of note, 21.3% of pneumococci were penicillin G-resistant (i.e., Canada, 10.3%; United States, 32.6%!). Corresponding rates of erythromycin resistance were 16.3% and 31.5%, respectively.

The molecular mechanism of penicillin resistance in the pneumococci is the uptake of penicillin-binding protein (PBP) genes from less susceptible streptococcal species (e.g., *Streptococcus mitis*) and integrating pieces of those genes into the pneumococcal PBP genes. The resulting PBPs have a lower binding affinity for penicillin and other β-lactam antibiotics but are able to synthesize cell walls in an apparently normal fashion. Hence, clinicians must use higher and higher doses of penicillin to kill the pneumococci, with the potential for significant adverse effects (e.g., seizures). Resistance to macrolides (i.e., erythromycin, clarithromycin, and azithromycin) occurs by different mechanisms: ribosomal methylation, rRNA mutations, and efflux.

Penicillin-resistant pneumococci are of concern in the elderly for several reasons. First, pneumococci still account for up to 40% of all significant respiratory isolates that cause pneumonia in the elderly. These organisms are at least four times more frequent than *Legionella* species and probably equal the frequency of gram-negative pneumonias. Second, these strains are frequently resistant to many of the oral cephalosporins, the macrolides, trimethoprim-sulfamethoxazole, and a variety of other agents used to treat pneumonia.

Recent data suggest that infection with penicillin-resistant pneumococci may be associated with a higher mortality than infections caused by susceptible strains. A 10-year prospective study of 504 adults with culture-proven pneumococcal pneumonia found that 29% had penicillin-resistant isolates and 6% had cephalosporin-resistant isolates (Pallares et al., 1995). The mortality rate was 38% in patients with penicillin-resistant isolates and 24% for those with penicillin-susceptible isolates. Although co-morbidity and age were the main factors associated with mortality, the high mortality rate associated with penicillin resistance is a troubling statistic. Hence, the Infectious Disease Society of America recommends that vancomycin or the new antipneumococcal fluoroquinolones be used for the treatment of pneumococcal infections that have penicillin or ceftriaxone minimum inhibitory concentrations greater than 2 μg/mL. Several potent agents with enhanced activity against gram-positive organisms are in development, but their utility for the treatment of serious infections caused by penicillin-resistant pneumococci remains to be determined. Telithromycin, a ketolide antibiotic effective against macrolide and penicillin-resistant pneumococci, should be used with caution due the small but real risk of hepatotoxicity.

Pneumococcal pneumonia outbreaks in nursing homes are not uncommon. Studies have found that uninfected residents may be colonized, as well, suggesting substantial nosocomial transmission of resistant pneumococci. Therefore, if resistant pneumococci are isolated from pulmonary infections within chronic-care facilities, respiratory isolation measures are advisable.

Even in nursing homes, vaccination rates are low. The low rate of vaccination may be attributable to the many physicians who are unconvinced of the vaccine's efficacy in the elderly. Although conclusions from several studies are conflicting, the efficacy of the vaccine is estimated to be about 58% in the 65- to 74-year-old age group and about 13% in the over-85 age group (Nuorti et al., 1998). Despite this relatively modest efficacy, the significant morbidity and mortality associated with serious pneumococcal disease and the increasing rates of resistance argue strongly for routine vaccination of the elderly on admission to skilled nursing facilities and revaccination every 4 to 6 years.

Pneumococcal vaccines with greater immunogenicity are needed to provide protection in the elderly. Conjugate vaccines, in which a protein that elicits a durable immunogenic response is attached to the pneumococcal polysaccharides, are currently being studied. The 7-valent pneumococcal conjugate (i.e., PCV-7, Prevnar-Wyeth) vaccine (i.e., types 4, 613, 9V, 14, 18C, 19F, and 23F) attached to diphtheria CRM_{197} protein is gaining extensive experience. This vaccine covers five of the seven most prevalent serotypes that are penicillin-resistant. PCV-7 vaccine has demonstrated efficacy in the prevention of bacteremia and meningitis. In a recent study (Kyaw et al., 2006), rates of invasive disease caused by penicillin-nonsusceptible strains and strains not susceptible to multiple antibiotics decreased by 57% and 59%, respectively. Among children under 2 years of age, disease caused by penicillin-nonsusceptible strains was decreased by 81%. Moreover, among persons 65 years of age and older, disease caused by penicillin-nonsusceptible strains decreased by 49%. Also, rates of resistant disease caused by vaccine serotypes fell 87%. This vaccine confers "herd immunity" as well. It is hoped that conjugate vaccines will prove to be more effective than the presently available polysaccharide vaccine and that this will inspire more widespread use among the institutionalized elderly.

ROBERT A. BONOMO
LOUIS B. RICE

See also

Immunization

Internet Resource

Centers for Disease Control and Prevention: Prevention of Pneumococcal Disease
http://www.cdc.gov/epo/mmwr/preview/mmwrhtm1/00047135.htm

REFERENCES

Chi, R. C., Reiber, G. E., & Neuzil, K. M. (2006). Influenza and pneumococcal vaccination in older veterans: Results from the behavioral risk factor surveillance system. *Journal of the American Geriatrics Society*, *54*(2), 217–223.

Hoban, D., Waites, K., & Felmingham, D. (2003). Antimicrobial susceptibility of community-acquired respiratory tract pathogens in North America in 1999–2000: Findings of the PROTEKT surveillance study. *Diagnostic Microbiology and Infectious Disease*, *45*(4), 251–259.

Jacobs, M. R., Koornhof, H. J., Robins-Browne, R. M., Stevenson, C. M., Vermaak, Z. A., Freiman, I., et al. (1978). Emergence of multiply resistant pneumococci. *New England Journal of Medicine*, *5*, 299(14), 735–740.

Kyaw, M. H., Lynfield, R., Schaffner, W., Craig, A. S., Hadler, J., Reingold, A., et al. (2006). Active bacterial core surveillance of the emerging infections program network. Effect of introduction of the pneumococcal conjugate vaccine on drug-resistant *Streptococcus* pneumoniae. *New England Journal of Medicine*, *354*(14), 455–463.

Nuorti, J. P., Butler, J. C., Crutcher, J. M., Guevara, R., Welch, D., Holder, P., et al. (1998). An outbreak of multidrug-resistant pneumococcal pneumonia and bacteremia among unvaccinated nursing home residents. *New England Journal of Medicine*, *338*(26), 1861–1868.

Pallares, R., Linares, J., Vadillo, M., Cabellos, C., Manresa, F., Viladrich, P. F., et al. (1995). Resistance to penicillin and cephalosporin and mortality from severe pneumococcal pneumonia in Barcelona, Spain. *New England Journal of Medicine*, *333*(8), 474–480. Erratum in *New England Journal of Medicine*, *333*(24), 1655.

INFORMATION TECHNOLOGY

Interactive technology, specifically the Internet, has radically altered the way individuals communicate, interact, access information, and make health care decisions. Nowhere is this change more dramatic than in the older population. From 2000 to 2004, the number of seniors on-line increased by 47%; approximately 8 million seniors, or 22% of the 65 and older population use the Internet (Pew Internet and American Life, 2004). Although this number still lags behind the general population, 58% of Americans ages 50 to 64, 75% of 30- to 49-year- olds, and 77% of 18- to 29-year-olds go on-line (Pew Internet and American Life, 2004), the increase has been most dramatic among the older population. As the number of "soon to be seniors" (i.e., 50 to 64 years of age) approaches retirement, the numbers of seniors using telecommunication and the Internet to access health care information will be even more profound. They will use the technology to manage their health care, research treatment options, investigate health care policies, make financial and business decisions, and arrange travel and recreation activities.

Interactive Health Communication and Older Adults

As a result of the rapid technological advances and ease of use of the Internet, the World Wide Web has become a most important resource in education and information dissemination. In the health care arena, e-Health has emerged as a major catalyst of health information and health care transactions (Eysenbach, 2001). Whether accessing information about specific illnesses, purchasing prescriptions, or communicating with health care providers, e-Health will continue to be a defining source of health care interaction. Seniors, the most vulnerable population for many illnesses, functional disabilities, and social isolation, stand to benefit the most from effective interactive communication and access to Internet resources.

The proliferation of Web sites geared specifically to the needs of older adults attests to the important role this technology can play in the lives of the 65 and older group. However, despite the increase in Internet use by seniors, recent studies support that 67% of those 65 and older have never used the Internet (Kaiser Family Foundation, 2005). They may have access to a computer at home, but they do not go on-line. This situation provides an opportunity to reach out to this population to promote computer literacy and competency. Studies support that seniors would benefit from free computer classes, financial assistance, help lines for technical difficulties, and volunteer visits for technical problems.

In addition to the perceived difficulties by seniors in use of the Internet, there is a "digital divide" among income groups and access to telecommunication services. The disparity of income affects all ages but is most pronounced among seniors. According to the Kaiser study, 64% of all seniors on Medicare have an annual income below $20,000 whereas only 8% have an income of $55,000 and above. This disparity in income is mirrored in the population that uses the Internet; only 15% of those in the under–$20,000 range are likely to go on-line, while 65% of those in the higher income bracket are likely to go on-line (Kaiser Family Foundation, 2005). The "wired seniors" are at an advantage, but it is the seniors in the lower income group who could most benefit from access and familiarity with telecommunications. Providing outreach to the most disadvantaged is a challenge to policy makers, health care providers, and community organizations.

Remote Monitoring for Health Care

The use of electronic information and communication technologies to provide and support health care when distance separates participants has gained prominence because of the accessibility and flexibility of technology. Success in remote monitoring of specific populations has significant implications for improved health care outcomes. Potential benefits include early management for impending medical emergencies, home monitoring of patients posthospital stay, and mobility monitoring for elderly patients with dementia and functional disabilities (Meischke, Eisenberg, Rowe, & Cagle, 2005).

Although telemonitoring has not been taken advantage of by care providers and the health care profession, it has the potential for providing cost-effective care as well as improved outcomes, particularly in patients with chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), and hypertension. In addition to improved patient outcomes, other benefits include decreased rehospitalizations, reduced hospital stays, improved vitality, and patient perceived quality of life (Jacobus, 2003).

The Internet allows for personal communication between caregivers and patients in areas with less personal communication and information access. Studies of remote monitoring reported decreased incidence of depression and isolation among the homebound elderly as well as improved lifestyle and functional outcomes. Web-based remote monitoring applications have customized features such as e-mail, health reminders, diaries, and health information. Even older seniors (i.e., 75 and older) demonstrate a remarkable facility to adapt and use computer-based communications and interactions when provided the opportunity.

The Future of the Internet and Elders

The over-50 age group is the fastest growing segment of the population to use the Internet; they are three times more likely to have Internet access than the over-65 age group (Pew Internet and American Life, 2001). This “silver tsunami” of soon-to-be-seniors will revolutionize how the Internet is used for e-health, recreation, business, socialization, and communication. There are thousands of Web sites devoted to seniors; SeniorNet has introduced more than 1 million older adults to computers and the Internet and supports 240 SeniorNet Learning Centers across the country (Adler, 2006). Studies indicate that older adults use computers for peer support, to obtain health care information, and to seek professional advice. As a result, individuals using the Internet feel empowered, are more informed, and are better equipped to participate in decision making about their health care. Seniors also extol the social benefits of the Internet such as discussion groups, contact with children and grandchildren, recreation ideas, and learning activities.

With the proliferation of Web sites for seniors, caution must be taken to assure that the sites are valid and provide the most accurate and current information. This is especially true of health care sites. The interpretation and use of Internet information in the senior population may need the support and guidance of health care providers. There are also health care sites that advise seniors and older seniors how to navigate Web sites, including www.healthfinder.gov, www.aarp.org, and www.nihseniorhealth.gov.

Provider and Consumer Issues

The Internet can be a powerful tool for health care providers in communicating with patients and improving consumer health care outcomes. Web-based technology can integrate knowledge sources, clinician expertise, and patient-based preferences. How health care professionals will incorporate the medium into their practice and use it as a major source of communication and interaction raises many issues, such as response turnaround time, type of transaction (e.g., prescription, appointment, and advice), authentication and confidentiality of communications, and the incorporation of e-mail as part of the medical record. In 1999, the Scientific Panel on Interactive Communication and Health (Wired for Health and Well-Being, 1999) recommended the following four strategic initiatives for interactive health care communication that are relevant today as we still attempt to incorporate interactive communication into health care:

1. Strengthen evaluation and quality of interactive health communication.
2. Improve basic knowledge and understanding of interactive health communication.
3. Enhance capacity of stakeholders to develop and use interactive health communication (includes consumers).

4. Improve access to interactive health communication for all populations.

The proliferation of Internet-based health care networks also challenges providers because the expansion of electronic health tools and e-Health enables the public to monitor their health status, report health data, access disease prevention information, and purchase health care products. The professional educational systems will have to change to produce and support professional practice in a dynamic, digital society. The fastest growing segments of the population (i.e., those older than 50) are enthusiastic about using electronic communication in creative and beneficial ways to improve the quality of their life. Professionals also need to demonstrate competence in incorporating technology into their care protocols and patient interactions.

BARBARA CARTY

Internet Resources

Administration on Aging
http://www.aoa.gov/

American Association of Retired Persons
http://www.aarp.org/

Foundation on Aging
http://www.spry.org/

Government Resources
http://www.seniors.gov

Health Finder Resource
http://www.healthfinder.gov/

Medicare
http://www.medicare.gov

Mental Health and Aging
http://www.mhaging.org

REFERENCES

Adler, R. (2006). Older Americans, broadband and the future of the net. Available at http://www.seniornet.org

Eysenbach, G. (2001). What is e-Health*? Journal of Medical Internet Research.* Available at http://www.jmir.org/2001/2/e20/

Jacobus, C. (2003). The billing, cost, and outcomes benefits from remote monitoring. Available at http://www.cybernetmedical.com/files/costoutcomebenefits.pdf

Kaiser Family Foundation (2005). e-Health and the elderly: How seniors use the Internet for health information. Available at http://www.kff.org/entmedia/upload/e-Health-and-the-Elderly-How-Seniors-Use-the-Internet-for-Health-Information-Key-Findings-From-a-National-Survey-of-Older-Americans-Survey-Report.pdf

Meischke, H., Eisenberg, M., Rowe, S., & Cagle, A. (2005). Do older adults use the Internet for information on heart attacks? *Heart and Lung, 34*(1), 3–12.

Pew Internet and American Life (2001). Wired seniors. Available at http://www.pewinternet.org/pdfs/PIP_Wired_Seniors_Report.pdf

Pew Internet and American Life (2004). Older Americans and the Internet. Available at http://www.pewinternet.org/PPF/r/117/report_display.asp

Wired for Health and Well-Being (1999). *Science Panel on Interactive Communication and Health*. HRSA. Washington, DC.

INJURY AND TRAUMA

Traumatic injury is a primary public health problem in the United States. Trauma occurs in all age groups with varying degrees of severity. As people live longer and lead more active lives, more injuries occur in the elderly population. Injuries in people age 65 and older lead to complications or death more often than do injuries in younger patients (Meldon, Reilly, Drew, Mancuso, & Fallon, 2002). Factors that influence the care needs of injured geriatric patients are preexisting disease, diminished physiologic capacity, and underlying disorders that may adversely affect the ability to heal. When an older person is injured, it is important to consider the mechanism of injury and to understand their underlying health problems in order to provide the most appropriate care. The stress of trauma can bring to the forefront signs and symptoms of a disease process that had previously been silent or ignored.

Falls

The most common mechanism of injury and the cause of most deaths due to injury in the elderly is falling (Bischoff-Ferrari, et al., 2004). Common causes of falls in older persons include weakness, environmental hazards, and orthostatic hypotension. Loss of consciousness can be caused by heart-rhythm disturbances; insufficient blood supply to the heart muscle, causing myocardial ischemia or infarction; stroke; seizure; anemia; and blood loss. Alcohol and prescription medication can alter mentation or gait stability and result in falls or other significant injuries in the elderly.

Signs of injury in elderly persons who fall may be due to the mechanical fall or may have caused the fall in the first place. Changes in orientation may indicate traumatic brain injury. The use of blood thinners in patients older than 55 who experience trauma may lead to more severe head injury and higher risk of death (Lavoie et al., 2004). Subdural hematoma should be considered in an elderly patient presenting with changes in mental status, headache, disturbances in ambulation, or nonfocal neurological findings. Spontaneous intracranial bleeding, stroke, or other cerebrovascular event is often the precipitating event resulting in the fall. Other findings in patients older than 65 years with acute changes in mental status may include cardiac dysrhythmia, acute myocardial injury, and metabolic disorders.

Musculoskeletal injuries often occur in older patients who fall. Hip fractures and other extremity fractures are common, primarily due to osteoporosis. A fall may be the initial presentation of pathological fractures due to primary or metastatic tumors. Spinal fractures may cause significant injury to the spinal cord and peripheral nerves. Clinical findings may be subtle, such as constipation or incontinence, or they may be obvious, such as paralysis.

Fall-prevention programs have been instituted in several states to identify effective strategies and evaluate their usefulness in the community (e.g., www.cdc.gov/programs). Examples include exercise programs that focus on muscle groups used for activities of daily living and home improvements that reduce obstacles and provide handrails. The risk of falling appears to be reduced by more than 20% in elderly persons who take vitamin D supplements (Meldon et al., 2002). Physical activity improves health status and reduces risk of death from injury (Warburton, Nicol, & Bredin, 2006).

Motor Vehicle Accidents

Motor vehicle accidents are the second most common mechanism of injury and account for approximately 260,000 injuries and nearly 8,000 deaths in those 65 years and older (Warburton, Nicol, & Bredin, 2006). It is well known that air bags and proper use of seatbelts can reduce injuries from crashes. In addition, clinicians must recognize cognitive, sensory, and physical impairments that may lead to a dangerous limitation of driving skills.

Pedestrian injuries in persons age 65 years and older represent 17% of all pedestrian fatal injuries. Factors contributing to automobile–pedestrian injuries in the elderly include altered gait and strength due to arthritis, muscle atrophy, and chronic neurological disease; decreased peripheral vision; impaired visual acuity; and osteoporosis and postural kyphosis; as well as progressive deafness.

Other Trauma

In a recent 9-year study, lawnmower injuries accounted for more than 663,000 visits to the emergency department. The majority of these injuries occurred in persons older than 60 years of age. Injuries included myofascial strain, being struck by debris, losing footing while pushing the mower, or falling from a riding mower (Costilla & Bishai, 2006).

Other significant mechanisms of injury to the elderly include stabbings, gunshot wounds, and burns. Stab wounds, as in all penetrating injuries, can be deceiving on the surface. Bacteria and other foreign substances carried to the deep tissues may lead to infection. Patients can present with a spectrum of problems, from local cellulitis to systemic illness. Guns in the home are associated with an increased risk of suicide in any age group. Complicating factors in burn injuries include dehydration from insensible water loss, scarring, joint contractures, and infection. Physical abuse of dependent older adults requires special consideration.

Diagnosis

The diagnostic workup of all trauma patients should include questions about the circumstances surrounding the injury, such as the height of the fall, the speed of the vehicle, associated loss of consciousness, and agility and mobility before and after the event. Establish whether the patient lives at home or in an extended-care facility. It is important to ask alert patients whether they can recall instances of rough handling or being struck by another person. Ask caregivers what happened to determine whether the stories match.

Use mechanism of injury and physical examination findings as a guide to order appropriate imaging studies, including ultrasound, computerized tomography (CT), magnetic resonance imaging (MRI), and vascular studies, as well as standard radiographs (X-rays). Other studies should be obtained based on clinical manifestations and suspicion of injury.

Management

Aggressive intervention in the elderly is warranted regardless of age, unless the patient is known to have a preexisting terminal disease or severe injuries with a low probability of survival. Guidelines for trauma management have been established by the American College of Surgeons Committee on Trauma (1996).

Treatment of geriatric multiple-trauma victims should follow standard trauma guidelines, including primary survey to assess critical injuries requiring immediate intervention, stabilization, and secondary survey for more complete patient assessment. Multiple studies now show that treating patients of all ages, including those older than 80, at a designated trauma center and the use of trauma system guidelines improves outcome (Meldon et al., 2002). Airway assessment is the first priority. An elderly patient may have upper-airway obstruction due to relaxed musculature of the oropharynx or displaced dentures impairing airflow. As soon as a patient airway is established, a search for blood loss, even in the face of normal vital signs, must be initiated. In older patients, commonly used parameters to assess hemodynamic status can be misleading; therefore, continuous monitoring of vital signs, cardiac activity, and oxygen saturation is essential.

Hypotension due to bleeding usually requires fluid replacement and must be used with caution in elderly patients, especially those with underlying cardiovascular disease. Judicious use of intravenous crystalloid fluid is recommended, followed by blood (i.e., packed red blood cells) after 1 to 2 liters of crystalloid infusion. Consider using platelets and fresh-frozen plasma sooner in the elderly, especially if underlying liver dysfunction or abnormal coagulation is present. Pain management must include monitoring for acute confusion and consideration of complications, including constipation and postural hypotension.

An appreciation of the fragility and limited physiological reserves of geriatric patients is essential for emergency medical service providers, the receiving emergency department personnel, the trauma center team, and all health care providers.

Jo E. Linder

See also

Burns and Related Safety Issues
Driving
Elder Mistreatment: Overview
Falls Prevention
Fractures
Hip Fractures

Internet Resources

Administration on Aging
http://www.aoa.dhhs.gov

American College of Surgeons Advanced Trauma Life Support Course
http://www.facs.org/trauma/atls/index.html

Boston University Health and Disability Research Institute
http://www.bu.edu/hdr/products/index.html

Centers for Disease Control and Prevention Injury Prevention Program
http://www.cdc.gov/programs/injury.htm

National Resource Center on Safe Aging
http://www.safeaging.org/

REFERENCES

American College of Surgeons (1996). Consultation for Trauma Systems. Available at: http://www.facs.org/trauma/atls/index.html

Bischoff-Ferrari, H. A., Dawson-Hughes, B., Willett, W. C., Staehelin, H. B., Bazemore, M. G., Zee, R. Y., et al. (2004). Effect of vitamin D on falls: A meta-analysis. *Journal of the American Medical Association*, *291*(16), 999–2006.

CDC Fact Sheet. Preventing Injuries Among Older Adults. Available at http://www.cdc.gov/programs..

Costilla, V., & Bishai, D. M. (2006). Lawnmower injuries in the United States: 1996–2004. *Annals of Emergency Medicine*, *47*(6), 567–573.

Lavoie, A., Ratte, S., Clas, D., Demers, J., Moore, L., Martin, M., et al. (2004). Preinjury warfarin use among elderly patients with closed head injuries in a trauma center. *Journal of Trauma*, *56*(4), 802–807.

Meldon, S. W., Reilly, M., Drew, B. L., Mancuso C., & Fallon, Jr., W. (2002). Trauma in the very elderly: A community-based study of outcomes at trauma and nontrauma centers. *Journal of Trauma*, *52*(1), 79–84.

Warburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, *174*(6), 801–809.

INSTITUTIONAL MISTREATMENT: ABUSE AND NEGLECT

Definitions Related to Institutional Abuse and Neglect

Institutional mistreatment generally refers to abuse and neglect that occurs in nursing homes or residential facilities for older persons (e.g., foster homes, group homes, personal care homes, assisted-living facilities) by perpetrators who have a legal or contractual obligation to provide elder victims with care and protection (Committee on National Statistics, 2002). Institutional mistreatment includes the mistreatment caused by individual staff members as well as ownership/managerial failures in which the administration of the facility contributed to or caused abuse or neglect. Legal definitions of abuse and neglect vary widely from state to state because various regulatory, law-enforcement, and social service entities possess the authority to address abuse and neglect of the elderly; however, the following are generally accepted definitions.

Abuse includes intentional actions that cause harm or create a serious risk of harm to a vulnerable elder by a caregiver or other person who stands in a trust relationship to the elder (Hawes, 2002). The forms of abuse are generally defined as follows (Burgess, Dowdell, & Prentky, 2000; Hawes, 2002):

- *Physical abuse*: contact with an older adult's body such as hitting, punching, slapping, pinching, and kicking
- *Sexual abuse*: any form of nonconsensual sexual contact, sexual coercion, sexual harassment, or sexual assault ranging from rape to unwanted touching or indecent exposure
- *Verbal abuse:* the use of any oral, written, or gestured language that includes disparaging or derogatory terms to a resident or within the resident's hearing distance, regardless of the resident's age, ability to comprehend, or disability, such as threats of harm or statements intended to frighten an older adult
- *Involuntary seclusion*: the separation of a resident from others or from his or her room against the resident's will or the will of the resident's legal representative
- *Mental/psychological abuse*: an action or verbal communication directed toward a resident that is threatening or menacing that results in fear or emotional or mental distress

Neglect is the failure by a caregiver to provide goods and services necessary to avoid physical harm, mental anguish, or mental illness (42 CFR Section 488.301). In general, neglect is considered the failure of a caregiver to fulfill his or her legal obligations or duties to an older person, including providing any food, clothing, medicine, shelter, supervision, and medical care and services that are essential for the well-being of an older adult.

Examples of or possible indicators of institutional mistreatment are "falls and fracture, physical or chemical restraints, malnutrition, dehydration, bed sores, defective equipment, lack of supervision, weight gain or loss, theft of money and personal property, unexpected or wrongful death, unsanitary conditions, untrained or insufficient staff, over-sedation, substandard medical care, and poor personal hygiene" (Clarke & Pierson, 1999, p. 632).

Risk Factors for Institutional Mistreatment

Older adults who reside in nursing homes and residential settings are particularly vulnerable to mistreatment because most suffer from several chronic diseases that lead to limitations in physical and cognitive functioning and are therefore dependent on others. In addition, many residents are either unable to report abuse or neglect or are fearful of retaliation. Social isolation, mental health challenges, and poverty are additional risk factors for mistreatment because residents with these characteristics are more likely to not have their needs for care and services met (Burgess, Dowdell, & Prentky, 2000; Hawes, 2002; Spector, Fleishman, Pezzin, & Spillman, 2001).

Incidence of Institutional Mistreatment

The number of older adults who have been abused or neglected in institutions is not known. However, there is significant evidence that institutional mistreatment is a pervasive problem. The Special Investigations Division of the House Committee on Government Reform issued a report in 2001 that nearly one-third of all certified facilities had been cited for some type of abuse violation that had the potential to cause harm or had actually caused harm to a nursing-home resident. Additionally, 10% of the nursing homes in the United States were cited for abuse violations that caused actual harm to residents or placed them in immediate jeopardy of death or serious injury. The cases involving abuse included physical and sexual abuse, as well as verbal abuse involving threats and humiliation (Abuse of Residents, 2006).

Government and ombudsman reports indicate that lack of appropriate attention to dramatic, unplanned weight loss, failure to properly treat pressure ulcers, inadequate care to maximize physical functioning in activities of daily living (ADL), lack of adequate supervision to prevent accidents, and failure to manage pain are common problems in nursing homes. Unsanitary conditions and unsafe medication practices are cited problems in residential-care facilities (Hawes, 2002).

Signs of Institutional Mistreatment

The signs of physical abuse include bruising, fractures, burns, lacerations, subdural hematomas, and pain. Accidental bruises occur in a predictable location pattern in older adults Accidental bruises did not occur on the neck, ears, genitalia, buttocks, or soles of the feet of older adults (Mosqueda, 2005). Other potential signs of mistreatment include unexplained or inconsistent explanations for injuries, heavy sedation, rapid weight change, unexplained or unexpected death, pressure ulcers, unexplained functional decline, repeated illnesses, and failure to contact the family about trips to the emergency room, illnesses, or accidents. Additionally, unexplained loss or transfer of belongings or funds or a transfer inconsistent with the older adult's previous wishes may suggest financial exploitation. The signs of mistreatment can also be emotional, including withdrawal, agitation, unusual behaviors, social isolation, and threatening or ignoring family and friends.

Protection From Mistreatment: Regulatory Requirements

Federal regulations require long-term-care facilities to develop and implement written policies and procedures that prohibit mistreatment, neglect, and abuse of residents and misappropriation of resident property. These requirements mandate staff and resident education on abuse and neglect, and procedures to follow in the event of suspected mistreatment, including investigative procedures, reporting to regulators, and protection and treatment of the resident. Furthermore, the law requires that the facility must not employ individuals who have been found guilty of abusing, neglecting, or mistreating residents or who have had a finding entered into the state nurse aide registry concerning abuse, neglect, mistreatment of residents, or misappropriation of their property (*Federal Register*, 1998). Most states also require assisted-living and personal-care homes to adhere to similar regulations. The administration of the facility serving older adults is responsible to not only ensure that these regulations are followed but also that there are adequate numbers of sufficiently trained and supervised staff to prevent mistreatment of residents (Abuse of Residents, 2006).

Additionally, federal law requires that states establish a nurse aide registry and investigate any complaints of abuse, neglect, and misappropriation of resident property by any nurse aide in a nursing home that participates in the Medicare or Medicaid program. The law provides that if a state finds that a nurse aide has neglected or abused a nursing-facility resident or misappropriated property of a resident, the state must include such information in the state's nurse aide registry and the aide is barred from nursing-home employment. In addition, under federal regulations, states are obligated to determine whether facility practices or policies caused or contributed to the substantiated abuse, neglect, or misappropriation (*Federal Register*, 1998).

Investigations of Mistreatment

Reporting of suspected cases of elder abuse is required in most states under mandatory elder-abuse-reporting laws. Although there are multiple agencies with some responsibility for investigating cases of abuse or neglect, in some instances there is no coordinated effort to address these allegations. For residents in nursing homes and residential-care facilities, those agencies differ across states but typically include long-term-care ombudsmen, adult protective services, the state survey agency responsible for licensing nursing homes, the state agency responsible for the operation of the nurse aide registry, Medicaid Fraud Control Units housed within the state attorney general's office, and professional licensing boards (e.g., Board of Nursing or Boards of Nursing Home Administrators) (Hawes, 2002). There is no federal patient abuse and neglect statute; therefore, government attorneys have effectively used a financial fraud statute, the federal False Claims Act, to address failure of care cases throughout the country.

There are several factors that complicate the task of adequately assessing for abuse and neglect. One factor is the fact that the signs that may indicate mistreatment tend to be attributed to either the normal processes of aging or to the chronic diseases and disabilities experienced by many frail older adults. Care needs to be taken by clinicians to secure a careful medical history, including baseline conditions, and conduct a comprehensive physical examination (Clarke & Pierson, 1999). Moreover, the monitoring of additional signs such as fear, confusion, and depression over a reasonable period may be warranted.

Another factor is that evidence of abuse or neglect is lost or mishandled by facility staff mandated to perform the initial investigation into abuse and neglect allegations. The responsibility for investigating elder mistreatment falls initially to the provider, which may or may not have adequately trained its staff on how to perform an investigation into abuse or neglect. This lack of knowledge regarding evidence preservation makes the task of taking appropriate action against potential wrongdoers very difficult for law enforcement or facility administration.

Finally, facility managers are responsible to protect the resident from future mistreatment during and after an investigation and to ensure proper and timely treatment of the resident's medical and psychological needs. How older adults are protected after abuse and neglect has been alleged is critical to ensuring the safety of not only the alleged victim but all older adults residing in an institutional setting. A report from the U.S.General Accounting Office describes serious underreporting of abuse, delays in abuse reporting, inadequate training of staff around abuse issues, and insufficient oversight by the Center for Medicare and Medicaid Services (U.S. General Accounting Office, 2002).

Marie Boltz
David R. Hoffman

See also

Adult Protective Services
Aging Agencies: Federal Level
Aging Agencies: State Level
Elder Mistreatment: Overview
Elder Neglect
Nursing Homes

Internet Resources

Clearinghouse on Abuse and Neglect of the Elderly (CANE), University of Delaware
http://db.rdms.udel.edu:8080/CANE/index.jsp

Elder Abuse Prevention, Administration on Aging Fact Sheet
http://www.aoa.gov/eldfam/Elder_Rights/Elder_Abuse/Elder_Abuse.asp

Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America, The Committee on National Statistics, National Academies Press
http://fermat.nap.edu/books/0309084342/html/index.html

The National Center on Elder Abuse
http://www.elderabusecenter.org/

http://www.aoa.gov/eldfam/Elder_Rights/Elder_Abuse/ABuseReport_Full.pdf

The nursing home abuse and neglect resource center for older adults and their families
http://www.NursingHomeAlert.com:

State Elder Abuse Hotline: Where to Report Abuse
http://www.elderabusecenter.org/default.cfm?p=statehotlines.cfm

REFERENCES

Abuse of Residents Is A Major Problem in U.S. Nursing Homes. Minority Staff, Special Investigations Division, Committee on Government Reform, U.S. House of Representatives, July 30, 2001. Available at http://www.heaton.org/nursinghomesabuse.pdf

Burgess, A. W., Dowdell, E., & Prentky, R. (2000). Sexual abuse of nursing home residents. *Journal of Psychosocial Nursing*, *38*, 11–8.

Clarke, M. E., & Pierson, W. (1999). Management of elder abuse in the emergency department. *Emergency Medical Clinics of North America*, *17* (3), 631–644.

Committee on National Statistics. (2002). Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America. Washington DC: National Academies Press.

Federal Register (42 CFR Ch. IV (10-1-98 Edition), §483.13 (c) (1) (ii) (A) (B)). 1998.

Hawes, C. (2002). Elder abuse in residential long-term-care settings: What is known and what information is needed? In *Elder mistreatment: Abuse, neglect, and exploitation in an aging America*, Committee on National Statistics of the National Academies. Available at http://www7.nationalacademies.org/cnstat/

Mosqueda, L. (2005). The life cycle of bruises in older adults. *Journal of the American Geriatrics Society*, *53*(8), 339.

Panel to Review Risk and Prevalence of Elder Abuse and Neglect (2002). *Elder mistreatment: Abuse, neglect, and exploitation in an aging America*. Research Council of the National Academies Panel to Review Risk and Prevalence of Elder Abuse and Neglect, R. J. Bonnie & R. B. Wallace (Eds.). The National Academies Press, Washington, DC. Available at http:// http://books.nap.edu/catalog/10406.html

Spector, W. D., Fleishman, J. A., Pezzin, L. E., & Spillman, B. C. (2001). *Characteristics of long-term care users*. Paper commissioned by the Institute of Medicine, Committee on Improving Quality in Long-Term Care. Publication No. 00-0049. Rockville, MD: Agency for Healthcare Research and Quality.

U.S. General Accounting Office (March 2002). Nursing homes: More can be done to protect residents from abuse. GAO-02-312.

INSTITUTIONALIZATION

Institutionalization refers to a placement of an individual in a long-term-care facility. The setting in which long-term care is provided is determined by the individual patient's medical, psychological, and social needs. The patient's financial status also affects placement. Long-term care may be provided in a nursing home, assisted-living facility, a life-care community, or at home. This discussion focuses on institutionalization within nursing homes.

A nursing home is an institution that provides patients with skilled nursing care, rehabilitation, and other medical and social services. In the United States, there are 18,000 nursing homes and more than 1.5 million nursing-home residents. The average length of stay for current residents in a nursing home is 892 days (National Center for Health Statistics, 2006). It is estimated that the number of people needing long-term care will increase dramatically over the next 10 to 20 years (Friedland, 2004).

More than 70% of nursing-home residents are female and about half of residents are 85 years or older. Patients are likely to have one or more impairments that affect their ability to perform activities of daily living (ADLs). Dementia is also a common problem in nursing-home patients, with 50% to70% of residents affected (AGS Foundation for Health in Aging, 2005).

Risk factors for nursing-home admission include older age, low income, lack of family support, cognitive impairment, and declining functional status (Aguero-Torres, von Strauss, Viitanen, Winblad, & Fratiglioni, 2001; AGS Foundation for Health in Aging, 2005).

The decision to institutionalize an elderly individual is fraught with considerable emotional and social stress for the patient and the family. There are many guides developed by the federal government, voluntary agencies, and consumer groups to assist in identifying quality facilities. The decision itself to institutionalize the individual is significant and life-altering for all. Indeed, the stress of relocation from a home to a nursing home has been identified as a major problem for new residents (Kao, Travis, & Acton, 2004).

Although medical care is a major concern in the nursing home, a nursing home is more than just a medical facility, it is a place where individuals live their daily lives. Goffman, in his early and seminal work, *Asylums*, describes how "total institutions" limit "inmates'" autonomy and independence and control the day-to-day existence of resident. Today, although nursing homes have some of the characteristics that Goffman enumerates, many long-term-care facilities strive to optimize residents' sense of control and maintain their individual sense of self.

Yet, in the medicalized environment of a nursing home, the "personhood" of the resident may be secondary. The experience of institutionalization for the elderly patient is often accompanied by a sense of loss. Privacy, personal possessions, access to resources, autonomy, and control are lost to a degree that varies with the organization and structure of the nursing home. Society's negative attitude about nursing-home placement may accentuate the new resident's feelings of loss and failure. Even in settings where private rooms are possible, meals are usually communal. Often, nursing home staff enter residents' rooms without knocking. The social amenities associated with privacy in one's own home are often not observed in the nursing-home setting. Indeed, as a quality indicator during nursing-home surveys, nursing-home staff are observed to see if they knock on the door before entering a resident's room.

To improve the quality of nursing homes, some long-term-care facilities are embracing the person-centered long-term-care community model (Nayak, 2006). This approach recognizes the importance of autonomy and individual choice for residents. Residents participate in decision making about their services and a home, rather than institutional, environment is fostered.

Many nursing homes encourage residents to decorate their rooms with their own furniture, pictures, and mementoes. By providing a familiar and comfortable environment, the nursing home can foster an enhanced sense of belonging for the resident. To empower residents, some nursing homes have a resident council where residents meet regularly for discussion of concerns related to living in the facility.

It is critical that the residents' primary aides, nurse, and physician know the life history of the resident, the values that have guided the resident's life, and ascertain what is meaningful to the individual (e.g., spiritual needs). An interdisciplinary approach is a key component of delivering quality care in the long-term-care setting. To respond sensitively to an older person's psychosocial and medical needs, all disciplines must communicate regularly to thoroughly discuss individual residents.

Studies indicate that social engagement is associated with an improved quality of life and a prolonged life span (Bassuk, Glass, & Berkman, 1999). Creativity is needed to develop programs where long-term-care residents are encouraged to make new friends and establish meaningful social networks and activities within their new "home." Quality recreational programs can add significantly to the resident's life. For example, some nursing homes have developed successful intergenerational collaborations between children and older residents through "friendly visiting programs" and joint theater productions. Also, continued family involvement with a resident after admission to a long-term-care facility has great significance to both the resident and his or her relative(s).

Given the demographic inevitability of more older people requiring long-term care, there is an unparalleled opportunity to create innovative nursing homes that respond more to their vulnerable residents. The challenge ahead is formidable.

MICHELE G. GREENE
RONALD D. ADELMAN
SHEILA FITZSIMONS-SCHEURER
BETH L. G. HOLLANDER

See also

Continuing Care Retirement Communities
Culture Change
Nursing Home Managed Care
Nursing Homes

Internet Resources

AGS Foundation for Health in Aging: Aging in the Know
http://www.healthinaging.org/agingintheknow/chapters_ch_trial.asp?ch=15

American Health Care Association
http://www.ahca.org/

Medicare: Long-Term Care
http://www.medicare.gov/LongTermCare/Static/Home.asp

Medicare: Nursing Home Overview
http://www.medicare.gov/Nursing/Overview.asp

MedlinePlus
http://www.nlm.nih.gov/medlineplus/nursinghomes.html

National Center for Health Statistics: Nursing Home Care
http://www.cdc.gov/nchs/fastats/nursingh.htm

NIA AgePage
http://www.niapublications.org/agepages/longterm.asp

REFERENCES

Aguero-Torres, H., von Strauss, E., Viitanen, M., Winblad, B., & Fratiglioni, L. (2001). Institutionalization in the elderly: The role of chronic diseases and dementia. *Journal of Clinical Epidemiology*, *54*(8), 795–801.

Bassuk, S. S., Glass, T. A., & Berkman, L. F. (1999). Social disengagement and incident cognitive decline in community-dwelling elderly persons. *Annals of Internal Medicine 131*(3), 165–173.

Friedland, R. (2004). Caregivers and long-term care needs in the 21st century: Will public policy meet the challenge? *Georgetown University Long-Term Care Financing Project*. Available at http://www.ltc.georgetown.edu/pdfs/caregiversfriedland.pdf

Goffman, E. (1961). *Asylums: Essays on the social situation of mental patients and other inmates*. New York: Doubleday.

Kao, H., Travis, S., & Acton, G. (2004). Relocation to a long-term care facility: Working with patients and families before, during, and after. *Journal of Psychosocial Nursing and Mental Health Services*, *42* (3), 10–16.

Nayak, M. (2006). Future of LTC driven by person-centered care. *Caring Symposium Reporter* June, 13.

INTEGUMENTARY SYSTEM

Gray hair and thin, wrinkled, sagging skin are the most common features associated with aging. Most changes in the skin are due to a combination of senescence (i.e., intrinsic changes) and the action of external factors, mainly ultraviolet light (i.e., extrinsic changes, photoaging, or actinically induced changes). Health professionals must have a clear understanding of these factors to ensure the appropriate diagnosis and management of skin problems in the elderly. Exposed areas such as the face, neck, back of the hands, and forearms are the most readily inspected, and clinicians can easily fall into the trap of assuming that actinically induced "premature" aging changes are normal. Approximately 90% of the cosmetic changes seen in the skin are due to actinic injury. Indeed, changes due to photoaging—coarse and rough skin surface, wrinkling, mottling, and sagging—are probably synonymous with aging in the public mind. However, studies of areas commonly protected from the sun, such as the buttocks and breasts, have helped differentiate chronological changes in the skin from those caused by photoaging. Knowledge of intrinsic and extrinsic changes will help health professionals manage the skin care needs of the elderly and assist in the early identification of abnormal changes, particularly neoplastic problems.

Skin

Loss of elasticity and wrinkling, furrowing, pigmentary changes such as liver spots (i.e., solar lentigines), telangiectasia, and increased susceptibility to neoplastic changes are common features of aging skin. These changes are due to the interaction of intrinsic aging (including the action of hormones) and extrinsic aging (photoaging) on the epidermis, dermis, subcutaneous blood vessels, and skin appendages.

Actinic, sun-induced injury accounts for much of the damage seen in aging. Light-exposed areas show epidermal atrophy with dyskeratosis and reductions in melanocytes and Langerhans' cells. There is degeneration of dermal collagen bundles (i.e. photosclerosis) and increased elastosis. The blood vessels of the microcirculation exhibit thickening of the vessel walls. The clinical appearance of the skin is characterized by a thick, leathery texture, with marked loss of elasticity and wrinkling, hyperpigmentation, erythema, and inflammation with vascular ectasis and hemorrhages.

Intrinsic aging is associated with a number of skin changes, including dryness, decreased thickness of both dermal and epidermal layers, fragmentation of elastic fibers, and increased fragility. Flattening of the epidermo-dermal junction and some disruption of epidermal architecture are consistent features of chronological aging that may predispose to shearing-type injuries and blistering. Decreased melanocytes and Langerhans' cells result in uneven tanning and increased risk of actinic injury. The dermis thins with age and becomes more acellular and avascular; dermal collagen bundles become more closely packed, with less space between collagen fibers; there may be an increase in tensile strength but also some thinning of collagen fibers; and changes occur in the composition of the extracellular matrix. With progressive degeneration of elastic fibers and reduced numbers of fibroblasts and mast cells, aging skin tends to wrinkle and sag. Areas protected from light do not show the same vascular dilation as exposed skin, but there is some loss of vertical capillaries and dilation of lymphatic vessels.

The combination of intrinsic and extrinsic aging changes results in the characteristic appearance of aged skin. Common problems include xerosis (i.e., dry or rough skin), increased fragility, slower healing when injured, and increased susceptibility to bruising.

A decrease in both the number and the function of sweat glands leads to reduced sweat production. Sebaceous glands increase in size, but sebum production is reduced. On exposed areas such as the hands, the enlarged glands may present as yellowish, ring-shaped lesions that can be very similar in appearance to early basal-cell carcinoma.

Biopsy may be necessary to exclude cancerous changes. Changes in skin glands may also be linked to an increased tendency to develop comedones and cysts.

Ultraviolet B radiation converts 7-dehydrocholesterol in the skin into provitamin D. Epidermal 7-dehydrocholesterol and the release of vitamin D into the blood may be decreased by 75% in the aged (MacLaughlin & Holick, 1985).

Skin immune function is also reduced in aging. The number of epidermal Langerhans' cells is reduced by 20% to 50%, and actinic injury may further reduce the number in exposed areas. The number of mast cells in the dermis is also reduced. The percentage of T cells is reduced, and there is a marked reduction in the production of epidermal cytokines, which help stimulate the response of T cells in the skin. Reduced skin immune response may be a factor in increased susceptibility to chronic skin infections and skin cancers. The elderly seem to be particularly prone to viral and fungal skin infections such as dermatophytosis, herpes zoster, and bullous pemphigoid.

Benign and malignant skin neoplasms are more common in the elderly. Seborrheic keratosis is an atypical benign neoplasm that causes well-defined, raised lesions on the skin of the face, neck, chest, or upper back. The tan to black, warty lesions are covered with a greasy crust that is often itchy and may be scratched off to reveal a raw, pulpy base. Skin tags and cherry angiomas are other common benign growths. The elderly may suffer from the usual range of skin cancers, such as basal-cell carcinoma and squamous-cell carcinoma, but are also at risk for more unusual malignancies such as angiosarcoma of the face and scalp, Merkel cell tumors, and acantholytic squamous-cell carcinoma. The reduced skin immune response may result in fewer problems such as contact dermatitis but much slower resolution of such problems when they do occur. Patch-test reactions in the elderly are likely to develop much more slowly and are muted in comparison to patch-testing in younger patients. Richey, Richey, and Fenske (1988) suggest following up patch tests at 3 weeks in the elderly.

Decreased skin sensation and an increased pain threshold are often associated with aging. Free nerve endings do not appear to change with aging, but pacinian and Meissener's corpuscles, structures responsible for pressure and superficial tactile perception, show some functional and histological degeneration. This loss of sensory acuity may cause increased susceptibility to burns and mechanical trauma and reduced control of fine movement or maneuvers.

Hair

Aging is marked by a decline in hair follicle activity, with a marked reduction in the number of hair follicles per unit area, reduced growth duration, diminished shaft diameter, and greater time between growth cycles. More hair follicles are in the resting stage of the growth cycle; the hairs adhere poorly to the follicular unit and tend to fall out after normal shampooing or brushing. On the scalp, many terminal hair follicles regress and produce barely visible vellus-type hairs, such that individual hair length is reduced, hairs are much finer, and overall hair quality is diminished. Gray or white hair results from a loss of melanocytes in the hair bulb. Paradoxically, a number of previously vellus-type hairs develop into thick, prominent terminal hairs, most commonly on the ear, nose, upper lip, and chin. These thick, gray, unsightly hairs are difficult to remove and can embarrass both sexes.

Nails

Aging is associated with a range of changes in the color, contour, and thickness of the nails. The elderly are also prone to a range of nail disorders, or onychodystrophies (Singh & Haneef, 2005). Aging nails are often dull, lacking in luster, opaque in appearance, and yellow to gray in color. The crescent-shaped lunula may disappear. The nail develops an increased transverse convexity; transverse superficial furrows (i.e., onychorrhexis) and deeper ridges develop. The rate of nail growth is reduced, but nails may show abnormal thickening or thinning. Histology demonstrates increased keratinocyte size, with thickening of the dermal bed blood vessels and degeneration of dermal-bed elastic tissue. Increased formation of longitudinal ridges and a more marked separation of the horizontal lamellae of the distal nail plate, coupled with a rough surface and irregular distal edge, make the nails more brittle and easily broken. The calcium content of the nails increases while iron content falls.

Brittle nails may develop as a consequence of repetitive cycles of dehydration and rehydration or excessive use of dehydrating agents such as nail varnish or cuticle removers (Wallis, Bowen, & Guin, 1991) but may also be related to a number of disease processes (e.g., Raynaud's disease, hypothyroidism, respiratory or endocrine conditions). Brittle nails can be treated by lukewarm water soaks for 10 to 20 minutes at bedtime, followed by application of a moisturizing agent, preferably under an occlusive cover (Cohen & Scher, 1992). Nail varnish may help retain moisture if applied and removed at weekly intervals. Oral biotin may be beneficial in the treatment of brittle nails (Hochman, Scher, & Myerson, 1993). A number of nutitional and herbal supplements are sometimes recommended for the treatment of brittle nails but few are supported by adequate research. Chronic trauma and infections are common causes of onychodystrophy. Specific disorders include onychauxis (i.e., localized hypertrophy of the nail plate), onychoclavus (i.e., hyperkeratosis of the nail area, akin to a subungual corn), onychocryptosis (i.e., ingrown toenail), and onychogryphosis (i.e., localized or diffuse hyperkeratosis of the lateral or proximal skinfolds). Small hemorrhages and hematomas can form spontaneously under the nails; the great toe is a common site for subungual exostosis (i.e., abnormal, benign formation of bone).

Colin Torrance

See also

Foot Problems
Skin Issues: Bruises and Discoloration
Skin Tears

Internet Resources

American Academy of Dermatologists
http://www.skincarephysicians.com/agingskinnet/index.html

Dermatology of Medical Students
http://sprojects.mmi.mcgill.ca/dermatology/

GeroNurse Online
http://www.geronurseonline.org/index.cfm?section_id=31&geriatric_topic_id=11&sub_section_id=77&tab=2#item_6

REFERENCES

Cohen, P. R., & Scher, R. K. (1992). Geriatric nail disorders: Diagnosis and treatment. *Journal of the American Academy of Dermatology*, *26*(4), 521–531.

Hochman, L.G., Scher, R. K., & Meyerson, M. S. (1993). Brittle nails: Response to daily biotin supplementation. *Cutis*, *51*, 303–305.

MacLaughlin, J., & Holick, M. F. (1985). Aging decreases the capacity of human skin to produce vitamin D3. *Journal of Clinical Investigation*, *76*(4), 1536–1538.

Richey, M. L., Richey, H. K., & Fenske, N. A. (1988). Aging-related skin changes: Development and clinical meaning. *Geriatrics*, *43*(4), 49–52, 57–59, 63–64.

Singh, G., Gurcharan, S., Nayeem, H., & Uday, A. (2005). Nail changes and disorders among the elderly. *Indian Journal of Dermatology Venereology & Leprology*, *71*, 386–392.

Wallis, M. S., Bowen, W. R., & Guin, J. D. (1991). Pathogenesis of onychoschizia (lamellar dystrophy). *Journal of the American Academy of Dermatology*, *24*(1), 44–48.

INTERGENERATIONAL CARE

Historically, the extended family provided the structure and source for the care and support of its members, regardless of age. Generations of grandparents, parents, and children, living under one roof or at least close by, provided economic, educational, and health support and a common framework for sharing values, history, religions, and cultural traditions. Families shared responsibility for child-rearing and caring for frail family members according to the family's ethnic and cultural traditions.

With an increasingly mobile and industrial urban-based society, family members from different generations are less likely to have the kind of day-to-day contact that traditionally occurred. Activities like child-rearing, caring for frail elders, and relaying religious and cultural values are often shifted to people outside the family or to institutions such as day-care centers, schools, and nursing-care facilities.

Intergenerational programs provide opportunities to recapture the richness of contact and support available in an age-integrated society. Individuals, families, and communities can once again enjoy the benefits of living and learning in a caring community where people of all ages, diverse backgrounds, and experiences can interact. Ideally, intergenerational programs are structured so that all age groups benefit. In reality, the programs vary widely by the services they provide and are presumed effective because they meet numerous needs of individuals and communities. However, research is needed to determine their overall cost-effectiveness.

Definition of Intergenerational Programs

Generations United, one of the earliest programs, defined intergenerational programming as “the purposeful bringing together of different generations in ongoing mutually beneficial planned activities designed to achieve specified program goals. These activities or programs increase cooperation, interaction and exchange between people of different generations” (Generations United, 2000). Talents and resources are shared across the generations; supportive relationships benefit both old and young as well as the communities in which they live. Many intergenerational programs tend to be bipolar, with young and old together. Some programs envision participants of all ages—young children, adolescents, and middle-aged and older adults. The age of the participants depends on the specific mission of the program. What defines a particular generation and differentiates it from earlier and later ones is left open.

History

Intergenerational programming began with the Foster Grandparent Program funded by the federal government in the 1960s, followed by the Retired Senior Volunteer Program (RSVP) in 1969. The University of Pittsburgh established Generations Together in 1979; Temple University established the Center for Intergenerational Learning 1 year later. Both these university-based centers began by developing intergenerational programs, education, training, and research. They continue to serve as clearinghouses for intergenerational resources.

Examples

Intergenerational programs can be a single program or a combination of mentoring programs in which older persons mentor or tutor young people, college students visit frail elders in their homes and provide various types of assistance, or adolescents and older adults are partnered for joint community service (Bartlett, 2005; Fried et al., 2004; Whitehouse, FallCrekke, & Whitehouse, 2004). They can also include foster grandparenting, day care for young children along with care for frail elders, and training programs for older adults as child-care providers on intergenerational teams (Gigliotti, Moris, Smock, Jarrott, & Graham, 2005; Middlemiss & Meyer, 2004).

Kinship care describes the situation in which grandparents or other relatives are raising children of impaired parents. At present, more than 4 million grandparents or other kin are raising children of impaired and nonimpaired parents, many of whom are taking on this commitment alone, on fixed incomes, and with limited access to the resources provided to parents or foster parents.

Family literacy programs are another type of intergenerational programming. Parents and other adults, along with their children, learn how to improve reading and writing skills by participating in a variety of shared projects. Research indicates that both children and adults learn better when working together rather than in groups of only children or only adults. Parents’ success in these programs gives them access to other opportunities, such as employment and continuing education.

Some intergenerational programs focus specifically on health care issues, even though many programs include health education as part of their activities. For example, an urban program trained an intergenerational group of community residents, including school-aged children, to serve as health educators about cancer prevention, detection, and treatment in an African American neighborhood (Lowe, Barg, Norman, & McCorkle, 1997). The Teen-Age Mothers-Grandmothers program worked with teenage mothers-to-be and their mothers during the pregnancy. Findings suggest that teens whose mothers participated in the program were significantly less likely to drop out of school and had significantly better self-esteem (Roye & Balk, 1996).

Lessons From Successful Programs

Strong and sustainable intergenerational programs conduct the following core activities: conduct a needs assessment; establish measurable goals and objectives; develop a monitoring and evaluation plan; support collaborative efforts; create a realistic program design and budget; construct a plan for recruitment, selection, and matching of participants; train staff and participants; coordinate and supervise; recognize and support participants and staff; and provide regular, planned opportunities for reflection. Reflection refers to the process of key staff sharing their thoughts on what went well in the program and what elements could be improved.

Barriers and pitfalls in developing successful intergenerational programs include failure to involve representatives of the intended participant groups early in the planning process, failure to select staff and volunteers from the diverse cultural and ethnic groups represented in the target population, neglect of the principles of effective communication and teamwork (proximity alone is not sufficient to create effective interaction between participants of different ages), failure to maintain a balance between rewards and costs to volunteers, and forgetting to apply appreciation and celebration liberally.

Future of Intergenerational Programs

Intergenerational programs will be affected by changes in the health care system and in society's determination of the appropriate balance of responsibility—between formal and informal caregivers—for the health care of its elderly citizens. Better integration of acute- and chronic-care models is needed to provide a seamless continuum of care for individuals as they move between different phases of illness and care needs.

Intergenerational work and biopsychosocial models of care will likely increase the importance of geriatric interdisciplinary teams. Just as teams often include various generations of health care providers, they will be interacting with various generations of family involved in the care of one of its members.

The future is also likely to raise ethical issues about the allocation of resources. The opportunity for discussion about important public policy choices should occur in an intergenerational context. To improve the quality of the health care system for all, intergenerational health programs can be a locus for critical discussions to prevent or ameliorate socially harmful intergenerational conflicts around issues of social equity.

NANCY S. WADSWORTH
PETER J. WHITEHOUSE

See also
Grandparents as Family Caregivers

Internet Resources

Administration on Aging Intergenerational Programs, Projects, and Training
http://www.aoa.dhhs.gov/aoa/webres/intergen.htm

Center for Intergenerational Learning at Temple University
http://templecil.org/index.htm

Generations Together, University of Pittsburgh
http://www.pitt.edu/~gti/

Generations United
http://www.gu.org/

REFERENCES

Bartlett, J. (2005). Intergenerational retreat revisited: Adolescent girls and older women share residual impressions of a single-gender group experience on female development four years later. *Journal of Intergenerational Relationships*, *3*(2), 23–41.

Fried, L., Carlson, M., Freedman, M., Frick, K., Glass, T., Hill, J., et al. (2004). A social model for health promotion for an aging population: Initial evidence on the Experience Corps model. *Journal of Urban of Health*, *81* (1), 64–78.

Gigliotti, C., Morris, M., Smock, S., Jarrott, S., & Graham, B. (2005). Intergenerational summer program involving persons with dementia and preschool children. *Educational Gerontology*, *31*(6), 425–441.

Lowe, J., Barg, F., Norman, S., & McCorkle, R. (1997). An urban intergenerational program for cancer control educaton. *Journal of Cancer Education*, *12*(4), 233–239.

Marx, M., Cohen-Mansfield, J., Renaudet, K., Libin, A., & Thein, K. (2005). Technology-mediated versus face-to-face intergenerational programming. *Journal of Intergenerational Relationships*, *3*(3), 101–118.

Middlemiss, W., & Meyer, B.,(2004). Introducing an intergenerational, Internet-based tutoring program: Meeting program challenges. *Journal of Intergenerational Relationships*, *2*(2), 7–25.

Roye, C., & Balk, S. (1996). Evaluation of an intergenerational program for pregnant and parenting adolescents. *Matenal Child Nursing Journal*, *24*(1), 32–40.

Whitehouse, C., FallCreek, S., & Whitehouse, P.,(2004). Using a learning environment to promote intergenerational relationships and successful aging. In M. L.Wykle, P. J. Whitehouse & D. L. Morris (Eds.), *Successful aging through the life span: Intergenerational issues in health* (pp. 177–188). New York: Springer Publishers.

INTERNATIONAL PSYCHOGERIATRIC ASSOCIATION

The International Psychogeriatric Association (IPA), founded in 1982, is recognized as the world's leading multidisciplinary, nonprofit organization providing health care professionals and scientists with current information about behavioral and biological geriatric mental health. With more than 1,100 IPA members from approximately 70 countries, IPA is a veritable *Who's Who* of the world's preeminent professionals and scientists interested in psychogeriatrics. The IPA is also committed to fostering education, facilitating the advancement of research, and promoting international consensus and understanding in psychogeriatric issues through its innovative educational programs, regional initiatives, scientific congresses, regional meetings, peer-reviewed quarterly journal (i.e., *International Psychogeriatrics,* published by Springer Publishing Company, New York), special-focus supplements, quarterly newsletter (i.e., IPA *Bulletin),* and Web site. IPA's goals are to:

- promote awareness of issues related to mental health of the elderly, including diagnosis and assessment, treatment, and rehabilitation
- provide an international forum for the exchange of information by professionals in all relevant disciplines on matters pertaining to the mental health of the elderly
- encourage the development of educational resources in basic and applied research in the field of psychogeriatics
- support the development of services for maximizing the potential of elderly persons in the community and in institutions
- support the role of families and professional caregivers
- encourage affiliation to IPA by related organizations

IPA's scientific meetings are educational vehicles that bring together opinion leaders from around the world to hear and present research papers, often prior to publication. Through plenary sessions, symposia, debates, and poster presentations, IPA meetings cover a vast array of topics, including anxiety, depression, dementia (i.e., Alzheimer's, Lewy body, and other types), behavioral and psychological symptoms of dementia, delirium, cognitive and noncognitive impairment, suicide, schizophrenia, transcultural issues, models of service delivery, caregiver issues, and others.

EDITORIAL STAFF

Internet Resource

International Psychogeriatric Association
http://www.ipa-online.org

INTERVIEWING

Highly developed interviewing skills are needed for effective and empathic communication between health professionals and older patients. Research has shown that the quality of communication between health professionals and patients significantly influences patient satisfaction, adherence to medication regimens, recommendations for changes in lifestyle and diagnostic tests, recall of information, anxiety, utilization of future health services, and health status (Stewart et al., 2000). Communication also influences the health professional's ability to diagnose and treat, his or her satisfaction with the encounter, and the risk of malpractice suits.

Barriers to quality communication may derive from the health professional, the older patient. or the medical-care system. Health professionals may not have sufficient training in communication or geriatric care. For example, they may not have been taught how to raise difficult-to-talk-about subjects, such as advance directives, sexual dysfunction, cognitive impairment, bereavement, and elder abuse, in a sensitive and effective manner. As well, practitioners' ageist beliefs may interfere with accurate diagnosis and treatment (e.g., misdiagnosis of cognitive impairment when depression is the underlying problem). In many care settings, health professionals are under enormous time constraints and financial incentives that conspire to undermine talk between health professionals and patients. Unfortunately, diminished dialogue makes it unlikely for health professionals to reach the "personhood" of the patient. Patients themselves may have ageist biases, attributing symptoms to the natural processes of aging. These misperceptions may result in older patients who do not discuss potentially serious problems with clinicians. Symptoms that may be embarrassing to older people, including urinary incontinence or memory loss, may also inhibit patient disclosure. Also, some older patients are fearful about the significance of new symptoms (perhaps perceiving a new symptom as a harbinger of death) and, therefore, may not reveal their presence. The lower health literacy of some older patients may translate into inadequate reporting of symptoms, poor elaboration of complaints, poor questioning of the clinician, and inability to adhere to the health professionals' recommendations.

One way to transcend an ageist perspective is to conduct a life history (or, if time does not permit, a modified life review) of the older patient to learn of the patient's past and present circumstances, values, and goals. A life history can explore an individual's identity, dispel ageist stereotypes, and enable the health care professional to provide effective and sensitive care. The acquisition of this information does not have to occur at one visit: It may take multiple interactions to develop a more complete knowledge of the patient's lifeworld. When a comprehensive understanding of the geriatric patient is unrealized, the patient and provider lose an opportunity to collaborate in the healing process (Adelman, Greene, & Ory, 2000).

Interviewing older patients requires many of the same skills required for interviewing younger adults. Practitioners must be attentive listeners and adept at identifying the patient's agenda for the visit. Interviews should be "patient-centered" and address the patient's major concerns. Open-ended questions to facilitate the patient-centered interview may be helpful but may also be inadequate. They may set the stage for an effective, empathic encounter, but practitioners must also carefully attend to patients' responses and listen to what is said, as well as what is unsaid. In one study of older patient–physician communication, there was discordance between the physicians' and patients' major goals and topics of the visit and somewhat less joint decision making in older patient visits than in younger patient visits. Therefore, to improve communication, it may be helpful for clinicians to elicit the older patient's agenda for the visit and incorporate these topics, when feasible, into the overall agenda for the visit.

Questioning is just one component of good interviewing skills. Providing sufficient information to the patient in language that is free of technical jargon and responding to the older patient's level of health literacy are also key.

It is important to realize that interactions between physicians and older patients may be significantly different from interactions with younger patients. The "old-old" (i.e., individuals 85 years and older) grew up in an age of deep respect for the authority of the physician and may not desire to participate as fully in the medical encounter as "young-old" or "middle-old" patients. The health care professional must determine the patient's wishes for participation in decision making. Research indicates that overall physician responsiveness (i.e., the quality of questioning, informing, and support) is better with younger patients than with older patients. Physicians are less likely to be egalitarian, patient, respectful, and engaged and to demonstrate therapeutic optimism with older patients than with younger patients. Research has also shown that older patients are less assertive than younger patients (Greene, Adelman, & Rizzo, 1996).

When interviewing older patients, attention must be paid to numerous factors that influence communication: the presence of multiple chronic conditions, sensory deficits, cognitive limitations, and the presence of an accompanying individual during the medical encounter. Responding to present-day multiple problems within the context of the patient's life requires time, which is an increasingly limited commodity in today's health care system. Thus, health care professionals must be skilled at focusing the interview and getting to the immediate issues at hand while achieving and maintaining the relationship's interpersonal aspects. There does not have to be a choice between providing effective care and maintaining a warm interpersonal relationship. Coordinating a medically efficient and interpersonally warm patient-centered visit constitutes the art of medicine. Although more medical schools and residency programs address training in communication skills, these efforts, in general, remain suboptimal and are not usually focused on the older patient–health professional interaction.

Sensory deficits in older patients (i.e., problems with hearing and vision) are likely to influence communication in medical encounters. The incidence of hearing loss increases each decade; as many as 70% of 70-year-old individuals may have hearing problems. To facilitate communication, health care professionals can try several approaches, including identifying the patient's specific needs in this area, reducing background noise in the office, speaking at a slightly louder level (without shouting), establishing good visual contact, rephrasing rather than repeating misunderstood phrases, pausing at the end of a topic to allow for questions, and amplifying with a microphone and headset.

Vision loss may also affect practitioner–patient interactions. Individuals older than 65 are more likely than younger individuals to experience a decrease in visual acuity, contrast sensitivity, and visual fields. Sitting close to the older patient and providing environmental supports, such as improved illumination in the office, can facilitate communication with patients with vision problems.

Although the incidence of dementia increases with age, it should not be assumed that all older people have a cognitive impairment. Inappropriately stereotyping patients with any cognitive dysfunction as being incompetent and incapable of participating in their care must be avoided (Adelman, Greene, & Ory, 2000); each patient must be individually assessed. Given the different communication and language impairments over the course of dementia, health care providers must become adept at identifying the needs of the patient at the particular stage of the illness.

Older patients are often accompanied to the medical visit by a third party (e.g., spouse, adult child, hired professional caregiver), who may significantly affect communication between the health care professional and the patient (Schilling et al., 2002). One study found that, in three-person encounters, older patients were often referred to as "he" or "she" (making the patient an outsider to the interaction). Indeed, exclusion of the older patient in triadic interaction is a not-so-subtle manifestation of ageism in the medical encounter. Moreover, when comparing two- and three-person interactions, it was found that, although the content of physicians' talk was no different, older patients were less responsive and assertive, and there was less shared laughter and joint decision making in triadic visits (Greene, Majerovitz, Adelman, & Rizzo, 1994). Current research in a primary care setting by the authors has shown that older patients are often accompanied by two or sometimes three other individuals who participate in the medical interview. Thus, the health care professional must also become adept at facilitating small-group discussions. However, the health care professional should spend some time alone with the older patient to give him or her the opportunity to express concerns and problems that may be highly personal.

One task of communication in the physician–older patient relationship is to determine the patient's wishes concerning advance directives. Because there may be disagreement between the patient and the health care proxy, it is important that the practitioner help the patient–health care proxy pair to achieve concordance on this difficult subject (Fins et al., 2005).

The provision of quality medical care to older patients requires sensitive communication skills on the part of health care professionals and a health care system that supports a patient-centered approach. Recognition of the interdependence of medical cure and interpersonal care is essential for the practice of effective and compassionate medical care.

Michele G. Greene
Ronald D. Adelman
Beth L.G. Hollander

See also

Communication Issues for Practitioners

Internet Resources

National Institute on Aging (NIA)
http://www.nia.nih.gov/Alzheimers/Publications/managing.htm

NIA, Working with your older patient, a clinician's handbook
http://www.niapublications.org/pubs/clinicians2004/index.asp

NIA, Talking with your doctor: A guide for older people
http://www.nia.nih.gov/HealthInformation/Publications/TalkingWithYourDoctor/default.htm

REFERENCES

Adelman, R., Greene, M., & Ory, M. (2000). Communication between older patients and their physicians. *Clinics in Geriatric Medicine*, *16*(1), 1–24.

Fins, J., Maltby, B., Friedmann, E., Greene, M., Norris, K., Adelman, R., et al. (2005). Contracts, covenants and advance care planning: An empirical study of the moral obligations of patient and proxy. *Journal of Pain and Symptom Management*, *29*(1), 55–68.

Greene, M., Adelman, R., & Rizzo, C. (1996). Problems in communication between physicians and their older patients. *Journal of Geriatric Psychiatry*, *29*, 13–32.

Greene, M., Majerovitz, D., Adelman, R., & Rizzo, C. (1994). The effects of the presence of a third person on the physician–older patient medical interview. *Journal of the American Geriatrics Society*, *42*, 413–419.

Schilling, L., Scatena, L., Steiner, J., Albertson, G., Lin, C., Cyran, L., et al. (2002). The third person in the room: Frequency, role, and influence of companions during primary care medical encounters. *Journal of Family Practice*, *51*(8), 685–690.

Stewart, M., Meredith, L., Brown, J. B., & Galajda, J. (2000). The influence of older patient–physician communication on health and health-related outcomes. *Clinics in Geriatric Medicine*, *16*(1), 25–37.

J

JOINT REPLACEMENT: LOWER EXTREMITY

Joints can be damaged by osteoarthritis, rheumatoid arthritis, and traumatic injuries like falls and motor vehicle accidents. These morbidities occur often in the elderly and cause joint dysfunction, resulting in extreme pain with activity and at rest. Often, pain motivates the patient to avoid using the joint, resulting in a weakening of the muscles that surround and stabilize the joint. This leads to further pain and deterioration of the joint. Joint replacement may be an option to maintain mobility and function and reduce the pain of diseased or fractured joints.

Joints in the lower extremities that are commonly replaced include the hip and knee, which function by different mechanisms. The hip is a simple ball-and-socket joint and the knee is a complex hinge-like joint. These are both diarthrodial joints that allow free motion about a cartilage-lined interface separated by a thin layer of synovial fluid enclosed by an impermeable joint capsule. Problems occur when the cartilage breaks down due to disease or the integrity of the joint is lost due to a fracture. Although cartilage is avascular and does not contain nerves that convey pain, underlying subchondral bone does. Pain in advanced joint disease occurs with excessive load on and sometimes exposure of subchondral bone. During joint-replacement surgery, the damaged joint is removed and replaced by an artificial device designed to replicate normal joint function.

Indications for joint replacement surgery include severe pain that restricts activities of daily living (ADL) and cannot be resolved by conservative approaches like oral medications, steroid injections, assistive devices, and weight reduction. The extent of bone damage can be evaluated through X-rays to determine the appropriate level of treatment. Because joint-replacement surgery has little impact on the physical demands required for the joint to function, patients 55 and older are considered good candidates. When a joint is damaged by acute trauma, emergency joint replacement may be necessary, unless contraindicated by poor medical condition, significant peripheral vascular disease, neuropathy affecting the joint, or an active infection.

The hip joint consists of the femoral head (the ball) and a cup-shaped bone in the pelvis called the *acetabulum* (from the Latin for vinegar cup). Depending on the extent of bone damage, hip reconstruction may involve replacement of either the femoral head (i.e., hemiarthroplasty) or the head and acetabulum (i.e., total hip arthroplasty). Although total hip arthroplasty is in fashion these days, femoral-head resurfacing is becoming more popular, despite variable long-term results (Grecula, 2005). Hemiarthroplasty is generally restricted to fracture treatment.

In hip-replacement surgery, the native femoral head is replaced by a prosthetic metal stem that inserts into the shaft of the femur. The metal stem is connected to a prosthetic head made of metal or ceramic that articulates with the acetabular cup. These components are available in various sizes and can be adjusted to reproduce native anatomic positioning. The acetabular component is a metal hemisphere attached to a polyethylene, ceramic, or highly polished metal liner. The optimal interface (i.e., polyethylene cup on a steel head, metal-on-metal, or ceramic-on-ceramic) is under debate and may depend on patient activity level and age (Grover, 2005; McMinn, Daniel, & Ziaee, 2005; Sandhu & Middleton, 2005).

Total hip-replacement surgery involves removing the proximal femur, including the femoral head and neck. The procedure begins with surgical exposure and dislocation of the joint. Reamers are then used to enlarge both the acetabulum and the medullary canal of the femur. The hip stem and prosthetic acetabular cup are inserted into the enlarged sections of the bones and fixation is achieved with or without cement. Bone cement is an acrylic plastic that is inserted into the reamed-out portions of the bone. The implant is then placed in the cement and held in the proper orientation until the cement hardens.

Alternatively, in cementless arthroplasty, the manufacturer coats the surfaces of the implants with a porous material and hydroxyapatite (in some models) to facilitate bony integration and strong fixation. The section of the bone that is reamed out is approximately the same size as the device itself. The implant is then pressed into the opening and may be secured with pegs or screws. In the elderly, cemented implants have been used because they are stronger in the short term. Porous coated implants have generally been used in younger or more active patients. Cementless arthroplasty lends to a cleaner revision and elicits fewer potentially harmful particles into surrounding tissue. Although cementless arthroplasty is gaining popularity among the elderly and is preferable in many ways to cemented arthroplasty, opponents to cementless joint replacement remain (Engh & Leung, 2003; Ranawat, Rasquinha, & Ranawat, 2003). Once the joint is replaced in both cemented and cementless hip replacement, the dislocated femur is reduced.

The knee joint acts as a hinge between the femur and the tibia. The movement of the knee joint can be very complex, combining flexion, rotation, and medial or lateral motion. As the knee flexes, the femur rolls back on the tibia, increasing the potential flexion of the knee. This posterior movement of the femur also causes lengthening of the quadriceps muscle. It is necessary to duplicate this complex motion in the artificial joint to ensure effective muscle contraction and maximum angular motion of the joint.

In general, the knee implant is used as a surface replacement on the ends of the femur and tibia. The artificial joint consists of a femoral component, a tibial component, and an optional patella replacement. Total knee arthroplasty may involve replacement of the entire knee or only the medial or lateral compartment (i.e., unicompartmental knee replacement). In either case, contours of the components mimic the shapes of the anatomical structures in the normal functioning knee joint.

The surgical technique for total knee replacement begins with surgical exposure and distraction of the knee joint. The worn articulating surfaces of the patella, tibia, and femur are cut at distinct angles exposing the underlying bone. These surfaces are oriented to provide proper alignment of the implants. The metal implants are then fitted over the surfaces and fixed to the bone by either bone cement or a porous coating on the devices, as in hip-replacement surgery. The femoral component reproduces the condyles of the native femur. The tibial component is composed of a metallic stem that inserts into the tibia and a tray that is attached to a replaceable polyethylene liner. The liner resembles the native tibial plateau in shape and size and can be removed and replaced if necessary. The patellar component is made of polyethylene and cemented into a prepared, flat patellar surface. Replacement of the patella and the posterior cruciate ligament, the strongest ligament in the joint, is an option.

Rehabilitation after joint replacement begins immediately following surgery. A successful outcome requires both replacement of the joint and strengthening of the surrounding muscles. Therefore, strengthening exercises are an important component of rehabilitation. Initially, the rehabilitation program includes exercises specific to the joint that was replaced, with weight-bearing as tolerated using crutches or a walker. The immediate goals of rehabilitation are to bear full weight using an assistive device and to function independently in ADL. Gait training gradually continues with a walker, crutches, or cane until the patient is able to walk without these assistive devices.

The benefits of total joint-replacement surgery are pain relief and restoration of joint function. Joint replacement allows patients to carry out many daily activities that were previously restricted by pain. Although these artificial devices improve the functioning of the joint, they do not provide the same range of motion as a normal, healthy joint. The patient can expect to be able to walk, sit, climb stairs, put on socks or shoes, and enter a car but not perform activities involving repetitive impact. Factors that may affect the outcome of rehabilitation include age, weight, level of activity, and other limited functions in the patient.

There are relatively few complications from total joint-replacement surgery, considering the magnitude of the operation. Aseptic or septic loosening may occur in one or more of the components, causing pain in the joint. Generally, this happens with cemented implants, due to degradation of the bone cement. Excessive wear of the device can generate particulate debris and accelerate implant failure. Other complications may include nerve damage from the surgery, dislocation of the joint, bone fracture, and infection of the joint. As with any major surgery, there are potential systemic complications, including infection, blood clot, and pulmonary embolism. Depending on the level of failure and complication, revision surgery may be required.

Total joint replacements of the hip and knee are among the most successful orthopedic procedures performed in the elderly. The patient can expect the implant to last for 10 to 15 years or more and provide pain-free functioning that would not otherwise be possible. Advances in the field of orthopedics are increasing the functional level of artificial joints and extending their longevity.

Currently, minimally invasive joint replacement is gaining popularity. It is designed to generate a smaller scar, less soft-tissue disruption, less postoperative pain, and faster recovery than conventional approaches. Surgical exposure is compromised and the technique is challenging, however. It remains controversial whether radiographic and clinical outcomes of minimally invasive hip and knee replacement are superior to conventional approaches (Ranawat & Ranawat, 2005; Stulberg, 2005).

Jonathan A. Zelken
Mathias Bostrom

See also

Fractures
Hip Fractures
Osteoarthritis
Osteoporosis
Prosthetics: Lower Extremity
Rheumatoid Arthritis

Internet Resource

American Academy of Orthopaedic Surgeons
http://orthoinfo.aaos.org/

HSS, Conditions & Treatments: Joint-Replacement Surgery
http://www.hss.edu/Conditions/Joint-Replacement-Surgery

REFERENCES

Engh, C. A. S., & Leung, S. (2003). Cementless stems in patients aged >60 years: Justified use. *Orthopedics*, *26*(9), 921, 948.

Grecula, M. J. (2005). Resurfacing arthroplasty in osteonecrosis of the hip. *Orthopedic Clinics of North America*, *36*(2), 31–42, x.

Grover, M. L. (2005). Controversial topics in orthopaedics: Metal-on-polyethylene. *Annals of the Royal College of Surgeons of England*, *87*(6), 416–418.

McMinn, D. J., Daniel, J., & Ziaee, H. (2005). Controversial topics in orthopaedics: Metal-on-metal. *Annals of the Royal College of Surgeons of England*, *87*(6), 411–415.

Ranawat, C. S., Rasquinha, V. J., & Ranawat, A. S. (2003). Cementless stems in patients aged >60 years: Just say no. *Orthopedics*, *26*(9), 920, 922.

Ranawat, C. S., & Ranawat, A. S. (2005). A common sense approach to minimally invasive total hip replacement. *Orthopedics*, *28*(9), 937–938.

Sandhu, H. S., & Middleton, R. G. (2005). Controversial topics in orthopaedics: Ceramic-on-ceramic. *Annals of the Royal College of Surgeons of England*, 87(6), 415–416.

Stulberg, S. D. (2005). Minimally invasive navigated knee surgery: An American perspective. *Orthopedics*, *28* (10 Suppl.), S1241–S1246.

K

KIDNEY AND URINARY SYSTEM

The two kidneys normally are located in the back just below the rib cage, although anatomic variations in number and location are common. The *nephron* is the kidney's functional unit, and each kidney contains many thousands of them. The nephron consists of a *glomerulus* that acts as a filter for blood and tubules that selectively reabsorb and secrete filtered molecules and water. The glomerulus filters the large quantities of blood circulating through the kidneys, allowing fluid and small molecules (but not large molecules, such as protein) and cellular structures such as red and white cells and platelets to enter the tubular system. In the tubules, molecules that the body needs to conserve, such as sodium, potassium, and glucose, are reabsorbed back into the bloodstream, and waste products of the body metabolism, such as *creatinine* and *urea*, can be excreted in the urine. This way the body's fluid and electrolyte content can be carefully regulated, varying the rates of reabsorption and secretion as necessary.

Ureters connect the two kidneys to the bladder (detrusor) made up of smooth muscle. This serves as a reservoir for urine until a time is convenient for emptying, when the urine leaves the *bladder* through the urethra. The filling and emptying of the bladder are under the control of the autonomic (sympathetic, parasympathetic) nervous system and voluntary (cortical) nervous system. Between the bladder and urethra are two sphincters (valves) that *control urination*—internal and external sphincters. Sympathetic stimulation allows the *filling of the bladder* by relaxing bladder musculature and closing the internal sphincter. When the bladder fills to a certain pressure (volume), the *micturition reflex* alerts the individual of the need to urinate. This reflex can be facilitated or inhibited by centers in the brain stem and cerebral cortex (brain stem *micturition center*) that control the external sphincter. This sphincter is under voluntary control and can initiate, prevent, or interrupt urination. Parasympathetic stimulation (*Valsalva maneuver*) promotes the opening of the internal sphincter and contraction of bladder musculature, initiating urination (micturition). Whereas interruption of the sympathetic nervous system has no effect on micturition, interruption of the parasympathetic nervous system (spinal cord injury) results in complete *bladder dysfunction*. In males, the prostate gland, normally walnut size, encircles the start of the urethra. With age, this tends to increase in size, so it may cause difficulty in the passage of urine and even obstruct urine flow.

Aging and the Kidney

Although kidney function often declines substantially with age, it usually remains sufficient to remove all waste products of metabolism (urea, creatinine, phosphorus), and to regulate the volume and composition (sodium and potassium) of body fluids. A decrease in the capacity for filtering the serum or plasma component of blood (*glomerular filtration rate*, or GFR) is the most easily measured and important functional defect caused by age-related anatomic and physiologic changes. The GFR can be measured by determining a *creatinine clearance* through collection of a timed urine sample and serum sample. This measure is stable in the normal young adult at 100–120 ml/min until age 30 to 40 years, after which the mean value decreases at a rate approaching 1 ml/min/year. Kidney function also is estimated for clinical purposes by measuring serum creatinine (normally 0.6–1.2 mg/dl) or serum *urea nitrogen* (normally 6–22 mg/dl) concentrations. These values exceed these levels only after some pathological process affects the kidneys to reduce their function to below one-third of normal. Because the creatinine in serum comes from muscle metabolism and because muscle mass decreases with age, the creatinine clearance may decrease substantially with age without any appreciable increase in the serum creatinine concentration. This is important to recognize when using serum creatinine concentrations to establish dosages for drugs cleared totally or partially by the kidney (digoxin and certain antibiotics, such as gentamicin). The early *Cockroft-Gault formula* for estimating creatinine clearance from serum creatinine concentration in older individuals has been improved upon using data from the *Modification of Diet in Renal Disease* (MDRD) study group (Levey, Bosch, Lewis, Greene, Rogers, & Roth, 1999).

Longitudinal studies show that *aging's effect on the kidney* (serial creatinine clearances in individuals) varies substantially. In a study of healthy, upper-middle class volunteers (*Baltimore Longitudinal Study of Aging*), one-third of older individuals showed no decrease in clearances over periods up to 20 years or more (Lindeman, Tobin & Shock, 1995). This finding suggests that the decline in renal function observed with age is due to underlying pathology, such as atherosclerosis, rather than any inevitable aging process (senescence).

Other *functions of the kidney* (ability to concentrate and dilute urine, excrete acids, reabsorb sugars, and secrete organic acids) decrease with age at rates closely paralleling changes in GFR. Leakage of protein (*proteinuria*) does not normally increase with age; its appearance in the urine generally is due to some disease process.

Common Disorders of the Kidney

The most common kidney disorders in older adults are similar to those seen at younger ages, although the frequency tends to vary. These include: (1) *nephrotic syndrome*, (2) *glomerulonephritis*, (3) partial or complete *blockage of a renal artery* or arteries, and (4) acute and chronic *renal failure* (insufficiency).

Nephrotic syndrome is due to loss of protein in the urine (greater than 3 gm/day) with generalized edema and susceptibility to infections. Diabetes mellitus is the most common cause, but it can also be seen with a variety of other immunologic and systemic disease processes.

Glomerulonephritis (diffuse inflammatory changes in the glomeruli) can be acute in onset following a variety of infections (post-infectious glomerulonephritis), or more chronic, often associated with systemic immunological diseases such as lupus erythematosus. Symptoms and findings include blood and protein in the urine, edema, and hypertension.

Partial (*renal artery stenosis*) and total occlusion (thrombosis, embolism) of one or more arteries in older persons are usually atherosclerotic in origin. They cause hypertension and loss of renal function. Cholesterol emboli are unique to older adults.

Acute renal failure (ARF) is characterized by rapidly rising serum urea nitrogen and creatinine concentrations, and can be ischemic or toxic in origin. Ischemic ARF results from inadequate perfusion of the kidneys due to dehydration, heart failure, and/or hypotension. Prolonged periods of poor perfusion, especially during major surgery, can result in injury to the renal tubules (*acute tubular necrosis*). Toxic ARF can result from administration of certain antibiotics and other medications, anesthetics, or diagnostic agents, or release of hemoglobin or myoglobin into the blood (*rhabdomyolysis*). It is important to rule out *urinary tract obstruction*, such as *prostate hypertrophy* or stricture, when *urine flow ceases* or is scant, as this is readily reversible if appropriately diagnosed.

Chronic renal failure is the end result of a wide array of pathological processes that reduce kidney function to the point where dialysis or transplantation is necessary for survival. In-center and home *hemodialysis* and chronic ambulatory *peritoneal dialysis* are options for the older person with end-stage renal disease. Most older adults do well on dialysis; problems arise primarily from comorbidity, such as accelerated atherosclerotic disease. *Renal transplantation* is increasingly being utilized in persons older than 60 years, but there remains a reluctance to allocate a scarce resource (the donor kidney) to those with a limited life expectancy. Nevertheless, older adult transplant patients matched with dialysis patients by age, underlying diagnosis, and comorbidities have 5-year survival rates of 81% versus 51% (Schaubel, Desmeules, Mao, Jeffery, & Fenton, 1995). Further descriptions of these conditions in older adults are reported elsewhere (Kelleher & Lindeman, 2002).

Urinary Incontinence, Infections, Tumors, and Stones

Urinary incontinence can result from inadequate closure of the sphincters between the bladder and urethra (*stress incontinence*), from hyperactive bladder musculature (*urge incontinence*), or a combination of both (*mixed incontinence*). It can also result from excessive filling of the bladder due to obstruction (*prostate hypertrophy*, *urethral stricture*) or loss of bladder stimulation (*diabetic neuropathy*) causing overflow incontinence.

Another common problem affecting the bladder of older persons is recurrent infection. Females are particularly prone to this, presumably because their short urethra facilitates bacterial access. Symptoms and findings include a need to urinate frequently, pain on urination (*dysuria*), and blood (*hematuria*) and white blood cells (*pyuria*) in the urine. Fever is often low grade or absent. High fevers and back (flank) pain generally indicate that the infection has involved the kidneys (*pyelonephritis*). Short courses of antibiotics usually clear *bladder infections*; more aggressive antibiotic therapy is needed for *kidney infections*. Older persons often have permanent bacterial colonization without symptoms (*asymptomatic bacteriuria*). Treatment of this condition is generally unnecessary.

Kidney cancers (*hypernephromas*) often are widely disseminated before detection. Blood in the urine is the most common first symptom, but unexplained fever, or low (anemia) or high (*polycythemia*) blood hemoglobin concentrations also may be clues. Bladder cancers are common in older adults and usually present with blood in the urine. The diagnosis can be made by viewing the inside of the bladder with a *cystoscope* inserted through the urethra. Treatment with surgical removal and/or radiation therapy usually controls the cancer.

Kidney stones occur at any age. Stone collection and analysis help to determine the type of stone, so that further stone formation may be prevented with appropriate medical management. Intense flank pain and blood in the urine are the primary manifestations. Many small stones pass spontaneously; larger stones, often associated with recurrent infections or blockage of urine flow, tend to require surgical removal or destruction with ultrasound (*lithotripsy*).

Robert D. Lindeman

REFERENCES

Kelleher, C. L., & Lindeman, R. D. (2002). Renal diseases and disorders. In E. L. Cobbs, E. H. Duthie, & J. B. Murphy (Eds.), *Geriatric review syllabus: A core curriculum in geriatric medicine* (5th ed., pp. 374–384). Malden, MA: Blackwell Publishing/American Geriatric Society.

Levey, A. S., Bosch, J. P., Lewis, J. B., Greene, T., Roger, N., & Roth, D. (1999). A more accurate method to estimate glomerular filtration rate from serum creatinine: A new prediction equation. Modification of Diet in Renal Disease Study Group. *Annals of Internal Medicine*, *130*, 461–470.

Lindeman, R. D., Tobin, J., & Shock, N. W. (1985). Longitudinal studies on the rate of decline in renal function with age. *Journal of the American Geriatrics Society*, *33*, 278–285.

Schaubel, D., Desmeules, M., Mao, Y., Jeffery, J., & Fenton, S. (1995). Survival experience among older adults end-stage renal disease patients. A controlled comparison of transplantation and dialysis. *Transplantation*, *60*, 1389–1394.

L

LATINO ELDERS

See
Hispanic and Latino Elders

LEISURE PROGRAMS

Leisure plays an important role in the psychological and physical well-being of older adults including those who are functionally independent and living in their own homes as well as those in senior day care, retirement homes, or assisted living (Janke, Davey, & Kleiber, 2006). The ideal leisure program, developed through a collaborative and cross-disciplinary process, enables elders to attain and maintain optimal levels of fulfillment, well-being, and self-efficacy across a wide spectrum of interests, abilities, age, health, gender, and marital status. Leisure activities more typically associated with the weekend during the working years take on increasingly new and different meanings as people age. Ironically, although older adults have much more discretionary time for leisure pursuits, they may lack the functional fitness to enjoy the more active and familiar activities of the past or to take up novel pursuits. Nonetheless, leisure in one's older years can be both restorative and transformative, helping individuals adapt to disruptive life changes in ways that contribute to an optimal quality of life (Kleiber, Hutchinson, & Williams, 2002).

Historically, passive leisure activities such as card and board games, bingo, and arts and crafts, as well as more solitary activities such as watching television, reading, or listening to music, have constituted the bulk of leisure-time pursuits in the older adult population. However, the advent of baby boomer retirement is cause for the development and implementation of increasingly active and creative leisure programs, for younger retirees especially, who are interested in active travel and hosteling, adventure tourism, dining out, volunteerism, sport leagues, exercise classes, and adult education, to name a few.

The design of leisure programs for the older adult should consider a client's physical, social, emotional, intellectual, ethnic/cultural, and spiritual needs. As at any other age, older adults value the concept of belonging and the virtue of being instrumental in their families and communities. There is a growing need for programs that help older adults discover or rediscover the idea of living a full and resilient life grounded in the belief that the end of life is to be lived just as intentionally and transformatively as any other life stage. As a result, it is crucial that intergenerational programming always be part of the leisure activities mix, with components that frequently allow participants to feel integrated into the social fabric of a community. This is particularly important as sectors of age segregation continue to grow, as evidenced by the proliferation of retirement homes and communities across the country.

Leisure programs must also consider "the value older individuals themselves place on leisure activities... and possible changes in such values in the context of reductions of physical functions, life events, and life transitions" (Strain, Grabusic, Searle, & Dunn, 2002). As people age, programs will need to adapt to changing health and life circumstances. Thus, leisure activities must meet a wide array of needs, including continuity, service, education, competition, social interaction, solitude, and finding meaning and purpose in life.

Continuity links people's past and present by giving them opportunities to participate in leisure activities they have always enjoyed. Although research shows some variation in leisure patterns over the lifespan, older adults typically continue activities that they both enjoy and are still able to do (Janke et al., 2006). The cessation of a particular leisure activity in later life is directly related to adaptations in physical and cognitive function as a result of life circumstances such as health, marital status, and social economic status that change with age (Strain et al., 2002).

The burgeoning elder population represents a largely untapped volunteer force. Many seniors desire to feel of service and can make significant contributions to the greater good in unlimited ways, from serving meals to the homeless, to knitting newborn caps for a women's shelter, raising scholarship monies for a local college, delivering cards and books to hospitalized patients, and tutoring in after-school programs.

Research clearly demonstrates that mental stimulation helps delay cognitive decline (Want, Karp, Winblad, & Fratiglioni, 2002). Leisure programs that provide continuing education opportunities help elders keep a lifetime focus on learning and growing. Any activity that stimulates thinking is appropriate, from crossword and number puzzles (e.g., Sudoku) to lectures, classes, book clubs, religious studies, and writing seminars. Creative leisure programs such as bird-watching clubs successfully combine cognitive and physical domains.

The opportunity to compete is important to many older Americans, and leisure programs that offer structured competitions and tournaments allow participants to test their abilities and challenge themselves to improve. Games often fall in this category, including sedentary games like bridge and euchre, as well as physical ones like Senior Olympics, golf, tennis, and bowling.

These activities also encourage important social interaction that provides companionship for older adults. At the same time, seniors often need opportunities for structured solitude in which to foster a creative, self-expressive nature through activities like painting. Furthermore, emphasis on a contemplative life that stresses spiritual health is a valuable benefit of well-designed leisure activities for older adults (Mowat, 2005). Activities such as prayer, meditation, yoga, and journaling are important opportunities for personal growth and renewed sense of meaning. Rather than being passive, escapist, or diversionary like watching television or napping, intentional pursuit of a contemplative life is critically important for dealing with stressful and disruptive life changes natural to the aging process.

Program design should be holistic, using a whole-person approach that is both person-centered and lifestyle-focused rather than activity-focused (Van Andel & Heintzman, 1996). Participants need activities that are intrinsically rewarding, give them a sense of control, provide opportunity for intergenerational interaction, and maximize successful participation across multiple physical and cognitive abilities. This means that leisure-program planning must revolve around the needs, interests, and abilities of the participant rather than those of the staff or facility. In this regard, structured programming is less important than the ability of the program to induce a sense of "flow," where participants find activities rewarding and meaningful in ways that create energy, focus, and satisfaction. In short, people of any age who find themselves in "flow" are engaged in activities that give meaning and purpose to life.

Most important, leisure programs must be accessible, affordable, frequently offered, flexible, modifiable, well-communicated, well-staffed, and relevant to participants. Residential retirement communities with more physical-activity opportunities, more physical-activity–related staff, better facilities, and multiple channels for communicating available activities have the most physically active residents (Harris-Kojetin, Kiefer, Joseph, & Zimring, 2005).

Leisure experiences continue to provide the single most important ingredient for adjustment to and enjoyment of the later years of life. Practitioners must consider the role that leisure has played and continues to play in the life of the older adult if they hope to contribute to their quality of life.

JULIE WALTON
GLEN VAN ANDEL
LOIS ROELOFS

See also

Creativity
Retirement
Therapeutic Recreation Specialists and Recreation Therapists

Internet Resources

Administration on Aging
http://www.aoa.gov/

Aging-Related Statistics
http://www.agingstats.gov

First Gov. for Seniors
http://www.firstgov.gov/Topics/Seniors.shtml

Older Americans 2004: Key Indicators of Well-Being
http://www.agingstats.gov/chartbook2004/default.htm

Site for Sudoku Puzzles
http://www.sudoku.com

REFERENCES

Harris-Kojetin, L., Kiefer, K., Joseph, A., & Zimring, C. (2005). Encouraging physical activity among retirement community residents: The role of campus commitment, programming, staffing, promotion, financing and accreditation. *Seniors Housing and Care Journal*, *13*(1), 3–20.

Janke, M., Davey, A., & Kleiber, D. (2006). Modeling change in older adults' leisure activities. *Leisure Sciences*, *28*, 285–303.

Kleiber, D., Hutchinson, S., & Williams, R. (2002). Leisure as a resource in transcending negative life events: Self-protection, self-restoration, and personal transformation. *Leisure Sciences*, *24*, 219–235.

Mowat, H. (2005). Ageing, spirituality, and health. *Scottish Journal of Healthcare Chaplaincy*, *8*, 7–12.

Strain, L. A., Grabusic, C. C., Searle, M. S., & Dunn, N. J. (2002). Continuing and ceasing leisure activities in later life: A longitudinal study. *The Gerontologist*, *42*(2), 217–223.

Van Andel, G., & Heintzman, P. (1996). Christian spirituality and therapeutic recreation. In C. Sylvester (Ed.), *Philosophy of therapeutic recreation: Ideas and issues* (Vol. II, pp. 71–85). Ashburn, VA: National Recreation and Park Association.

Want, H. X., Karp, A., Winblad, B., & Fratiglioni, L. (2002). Late-life engagement in social and leisure activities is associated with a decreased risk of dementia: A longitudinal study from the Kungsholmen project. *American Journal of Epidemiology*, *155*, 1081–1087.

LIFE EVENTS

Occasionally, a concept or theory is so irresistible that it takes the scientific community by storm. Introduction of the concept of life events to the social and biomedical sciences had precisely that effect, and it remains a major topic in aging research. Life events are identifiable, discrete changes in life patterns that create stress and can lead to the onset of illness or the exacerbation of preexisting illness. Why is the concept of life events so compelling? Numerous other variables are equally powerful predictors of physical and mental illness. Primarily, life events offered a potential social risk factor compatible with epidemiological theories of illness onset, theories that emphasize the role of environmental agents on the health of human beings. Although there is virtual consensus that social environments play a powerful role in health and illness, isolating relevant parameters of social environments and documenting their effects have been challenging. Life events are especially attractive because they represent a social risk factor rivaling physical risk factors in terms of being objective (i.e., occurrence of the event can be verified), potentially quantifiable, and occurring before illness onset, thus clarifying causal order.

Interest in life-events research did not originate in aging research, but many gerontologists have examined the effects of life events on health in later life. The life-events perspective is compatible with the crisis orientation that characterized early research on aging—an orientation that focused on the losses that are common in later life. Many of those losses (e.g., widowhood, economic problems) can be viewed as life events. Research has shown that older adults actually experience fewer life events than do young adults. Interest in the impact of life events on late-life health continues because of evidence that (1) the life events experienced by older adults are likely to involve major losses, especially bereavement; and (2) resources for coping with stress typically decrease in later life. Thus, older adults may be more vulnerable than younger adults to the adaptive challenges posed by life events.

Evolution of the Life-Events Perspective

Initially, research emphasized only one element of life events: the degree to which they disrupt established behavior patterns. Early research explicitly stated that subjective perceptions of stress are unimportant; it is the degree of change that calibrates the stressfulness of life events. Investigators using a more interactionist perspective demonstrated convincingly, however, that change itself is not the "active ingredient" in the link between life events and illness. Rather, perceptions of stress are crucial for understanding the effects of life events on health. Consequently, measures of life events are now routinely restricted to events that are perceived as negative or stressful by the individuals who experience them. The importance of experiential measures of life events is further documented by evidence that there is no life event that is uniformly described as positive or negative—stress is in the eye of the beholder.

In early research, life events were considered synonymous with social stress. It is now clear, however, that they are only one category of stressful experiences. Also important are chronic stressors, which are ongoing stressful experiences that do not represent sudden changes in behavior patterns but persist over long periods (e.g., chronic poverty, chronic marital conflict, long-term commitments to providing care for an impaired relative). Thus, social stress is a broad concept, with life events representing only one important area of inquiry.

Major Issues in Life-Events Research

Research on life events covers a broad range of issues. Two major research areas of special relevance to late life—and that have dominated the field more broadly—are reviewed here. First, however, a caveat is in order. Although stress theory posits that life events have negative consequences for both physical and mental health, the vast majority of research to date has focused on mental health outcomes, especially depression in later life. Thus, most of the evidence summarized here is based on studies of late-life depression. However, the more limited research on physical health also reports modest but significant relationships between life events and physical illness and functioning.

Mediators and Moderators

Without question, the major focus of life-events research has been understanding the effects of life events on health outcomes. It was observed early on that life events have variable outcomes; although they are statistically significant predictors of illness (see Kraaij, Arensman, & Spinhoven, 2002, for a meta-analysis of studies of older adults), most individuals who experience life events do not become ill. The central research question then became: Under what conditions do life events lead to negative health outcomes?

It is now clearly documented that whether stressful life events harm health is a function of both the strength of the event (e.g., death of a loved one is a greater threat than retirement) and the resources available to the individual for responding to the stress. Two major types of social resources are especially powerful in offsetting the effects of stress: economic resources and social support. The value of economic resources is straightforward: Many stressful situations can be remedied or at least diminished by adequate financial resources (e.g., the economic consequences of widowhood are minimized). Social support, which refers to the tangible and intangible forms of assistance provided by family and friends, is a broader resource.

Although both economic resources and social support have been shown to mediate the effects of stress on health outcomes, other research suggests that the effects of resources are especially important during times of stress. Thus, social support protects health *only* under conditions of stress rather than having a more general protective effect that exists independent of stress. Research provides empirical confirmation for both the mediating and stress-buffering hypotheses, reinforcing the vital role that social support plays in reducing the likelihood that stress will have negative effects on health.

There also is convincing evidence that psychosocial resources such as self-esteem and a sense of mastery mediate some of the effects of life events on health. These relationships are complex. On the one hand, high levels of self-esteem and mastery offset some of the potentially harmful effects of life events on health outcomes. On the other hand, stressful life events can erode self-esteem and mastery, increasing an individual's vulnerability to stress-related health problems. One of the important functions of effective social support is bolstering individuals' psychosocial resources so that they can better meet the challenges of stressful life events.

Life events (and stressors more generally) also have been investigated as mediators of the effects of *prior* risk factors on health. The different roles and locations in social structures that individuals occupy may affect their amount of exposure to life events and, thus, ultimately affect health. The primary factors examined as potential antecedents of exposure to life events have been standard demographic variables (i.e., age, sex, and race) and socioeconomic status. The general pattern of findings suggests that life events mediate some but not all of the effects of demographic characteristics and socioeconomic status on health. The unmediated effects of these variables have served as the foundation for theoretical speculation that specific subgroups of the population may be differentially vulnerable to life events and other stressors.

An emerging area of research is examination of the biological pathways by which life events put health at risk. Again, most evidence is based on studies of the effects of life events on depression. For example, stressful life events have been demonstrated to decrease immune function and increase coagulation among older adults (Hawkley & Cacioppo, 2004). These findings are especially important because decreased immune function and increased coagulation (i.e., clotting) occur with normal aging; life events exacerbate these processes.

Life Events in the Life-Course Perspective

Sociological studies of the life course also pay substantial attention to life events, although the term *life-course transitions* is used more frequently in that research tradition. One important element of life-course perspectives is an emphasis on the sequences of transitions that create long-term trajectories or pathways. Life-course studies have focused primarily on the timing and sequencing of events or transitions and the broad range of outcomes related to them (e.g., socioeconomic achievement, marital stability, and health) (see George, 2003, for a review of research in this tradition).

One of the contributions of life-course research has been documentation that some life events are so powerful that their effects on health last a lifetime. There is compelling evidence that childhood traumas—including physical abuse, sexual abuse, and parental divorce—are associated with the onset of mental health problems as much as 70 years later (Shaw & Krause, 2002). More than half on the men who are age 65 and older now participated in World War II. Combat exposure also is strongly linked to mental and physical health problems in later life. In addition to the direct effects of these traumas on health in late life, they also create a lasting vulnerability such that those who experience them react more strongly and negatively to other stressors experienced across adulthood (Kraaij & DeWilde, 2001).

Another contribution of life-course principles has been to spur investigators to examine issues of timing in greater detail, thus generating more fine-grained understanding of the links between life events and health. Examples of especially important contributions produced by detailed analysis of timing include documentation that life events are important in recovery from as well as onset of depression (i.e., life events delay or prevent recovery) (Bosworth, Hays, George, & Steffens, 2002) and evidence that the faster the rate at which life events happen, the greater their cumulative effects on depression (George & Lynch, 2003).

After more than 30 years, the antecedents and consequences of life events continue to engage the energies of social, behavioral, and biomedical scientists. The core of this research has been the links between stress and illness. More recently, life events have proved to be important for understanding psychological development throughout adulthood and the ways that status and well-being in late life are, in large part, the result of events experienced decades earlier.

Linda K. George

See also

Coping With Chronic Illness
Life Review

Internet Resources

Family Doctor
familydoctor.org/167.xml

Mental Health: A Report of the Surgeon General
www.surgeongeneral.gov/library/mentalhealth/toc.html#chapter4

National Mental Health Association
www.nmha.org/infoctr/factsheets/41.cfm

REFERENCES

Bosworth, H. B., Hays, J. C., George, L. K., & Steffens, D. C. (2002). Psychosocial and clinical predictors of unipolar depression outcome in older adults. *International Journal of Geriatric Psychiatry*, *17*, 238–246.

George, L. K. (2003). Life course research: Achievements and potential. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 671–680). New York: Kluwer Academic/Plenum.

George, L. K., & Lynch, S. M. (2003). Race differences in depressive symptoms: A dynamic perspective on stress exposure and vulnerability. *Journal of Health and Social Behavior*, *44*, 353–369.

Hawkley, L. C., & Cacioppo, J. T. (2004). Stress and the aging immune system. *Brain, Behavior, and Immunity*, *18*, 114–119.

Kraaij, V., Arensman, E., & Spinhoven, P. (2002). Negative life events and depression in elderly persons: A meta-analysis. *Journal of Gerontology: Psychological Sciences*, *57B*, P87–P94.

Kraaij, V., & De Wilde, E. J. (2001). Negative life events and depressive symptoms in the elderly: A life-span perspective. *Aging and Mental Health*, *5*, 84–91.

Pinquart, M., & Sorensen, S. (2006). Gender differences in caregiver stressors, social resources, and health: An updated meta-analysis. *Journal of Gerontology: Psychological Sciences*, *61B*, P33–P45.

Shaw, B. A., & Krause, N. (2002). Exposure to physical violence during childhood, aging, and health. *Journal of Aging and Health*, *14*, 467–494.

LIFE EXPECTANCY

See
Active Life Expectancy

LIFE EXTENSION

As soon as man developed self-awareness, he may have developed the ability to recognize his mortal nature. The *desire to live forever* in a youthful body, full of health and vigor, has been one of *Homo sapiens*' most consistent and heartfelt fantasies. Recent extensions of life up to seven-fold in short-lived invertebrate species, especially *Caenorhabditis elegans*, have led to speculation on the limits of human longevity: Do some humans show extraordinary life extension? What is known about the mechanisms of life extension? What interventions would allow us to maximize our life span potential?

Scientific Analysis of Longevity

Religious, mythological, and other mystical works frequently refer to long-lived human populations from some remote time or place, often during some previous Golden Age, and are indicative of humankind's longing for longer life. Reports of long-lived populations in remote places like *Vilcabamba*, Ecuador, the Himalayas, or *Soviet Georgia* are typically sheer fabrication and have failed to be verified. Those from the state of Georgia, for example, were likely put in place to elude the czar's draft in the Crimean War and were maintained by the Soviet Union for political purposes (Perls & Silver, 1999).

Demography is the science that deals with human longevity, among other things. Demographers are careful about accepting claims of extraordinary longevity, because of the human tendency to exaggerate one's age after a certain point. A combination of good documentation and continual historical verification of identity are used to rule out those making untruthful claims.

The average *length of the human life span* is increasing rapidly and has been doing so for about 150 years. In 1850 life expectancy at birth in the United States was 40 years for women and 38 for men, while in 2002 it was 79.8 years for women and 74.6 years for men, almost a two-fold increase. The overall mortality rate (the probability of death per year) has shown a consistent decline during the same period (Vaupel, Carey, Christensen, Johnson, Yashin, Holm, et al., 1998; Perls & Silver, 1999). Most of the *increase in longevity* in the 19th and first half of the 20th century resulted from better nutrition, public health (sanitation, clean water), and inoculations to prevent early childhood disease. The increase in life expectancy in the West during the last 50 years has occurred largely in the older populations, with the age 85 and older population showing the fastest rate of decline in mortality rate (Vaupel, Carey, Christensen, Johnson, Yashin, Holm, et al., 1998). Whether there is an upper limit to human life span is unclear (Vaupel, Carey, Christensen, Johnson, Yashin, Holm, et al., 1998; Olshansky, Carnes, & Butler, 2001) but this author favors the view that there are no built-in limits to human longevity.

Centenarians and Maximum Life Span

More and more people are managing to live a century. The number of centenarians alive today is unprecedented. The longest-lived individual was Madam *Jeanne Louise Calment* in Arles, France (Allard, Lèbre, & Robine, 1998), who died August 4, 1997 at the age of 122 years, 165 days. She rode a bicycle to the age of 100, but by the time of her death, she was blind, almost deaf, and confined to a wheelchair. Her genes may have contributed to her longevity—her father lived to age 94 years and her mother to age 86.

Although Jeanne Calment holds the record, an extraordinary number of centenarians are alive today. There are more than 50,000 in the United States alone; a little less than 20% are males. Worldwide, millions of centenarians are expected to be alive by 2020 (see if you have what it takes to be a centenarian by using the calculator at www.livingto100.com) (Perls & Silver, 1999). Although the probability of living to be 100 years has increased, the overall maximum human life span potential seems not to be increasing in a statistically detectable way.

Life Extension Strategies

Large numbers of over-the-counter drugs, dietary supplements, and nutraceuticals claim some beneficial effect on life extension. However, one should be careful before purchasing and consuming any such agents, since currently no scientifically validated agent has been shown to have a significant effect on human longevity. The Food and Drug Administration does not regulate dietary supplements, health foods, or nutraceuticals, and some of these agents could have a significant negative effect on health and may be addictive. However, 3 strategies have been shown to be effective in nonhuman species: dietary restriction (limiting total food intake while maintaining vitamins, etc.), genetic intervention, and drug treatments.

Dietary Restriction. McCay found that feeding rats fewer calories but a diet complete in vitamins and minerals, increased longevity. Numerous recent studies have replicated life extension in a variety of mammals and invertebrates (Weindruch & Walford, 1988). *Dietary restriction* (DR, also called *calorie restriction* or *food restriction*) refers to the method of extending mean and maximal life span by reducing caloric intake. DR is not starvation but a *reduction in caloric intake*, typically to about 60% of the normal *ad libitum* diet (Weindruch & Walford, 1988). Numerous physiological functions are changed by DR; indeed, it is difficult to find an age-associated change that is not slowed. Typical DR animals look and behave much younger than their chronological age would suggest, and this is true at the organ, cellular, and molecular levels. DR works best if the animal is restricted early in life, just after puberty, but even if initiated late in life, DR can have some effect on longevity that is almost proportional to the amount of time the animal is on DR. A typical DR mouse or rat lives about 30% longer and is much more lean and active at later stages of life. DR is often associated with reproductive sterility.

It has been quite difficult to reliably study DR in humans or to convince people to initiate a DR diet for themselves. The National Institutes of Health is currently funding DR research on macaques and rhesus monkeys to see if the observations made in rodents can be extended to primates. The results may suggest that DR works in monkeys, but it is not yet sure. There is anecdotal evidence that humans who practice DR are healthier and may have longer life spans; unfortunately, few of us have the ability to eat 40% less than that eaten by friends, every day, for the rest of our lives. Several start-up biotechs are attempting to overcome this problem using pharmaceuticals that will mimic the effects of DR (Johnson, 2005).

Genetic Effects. The genetic constitution of an organism has a significant effect on its longevity. In humans, only 15% to 35% of the variation in life span seems to be genetic, but this estimate could be quite wrong for many reasons. This does not mean that aging is controlled by 20% of the genes, or that 20% of *life is genetically programmed* and the rest determined by environment. There is good reason to suppose that centenarians have been blessed with good genes (good versions of the genes we all have, called "alleles"), so in a centenarian, 40 or 50 years of his/her life could result from genetic effects. Many groups currently are looking for such genes.

Scientists use life extension as a way to find genes affecting aging. It was proposed 20 years ago that genetic variants that lengthen life could be found (Johnson & Wood, 1982). Most genetic alterations shorten life because these mutants reduce overall health and fitness. It seems counterintuitive that a genetic mutation could lead to longer life because most people think of mutations as bad; however, to the species, the length of an individual life does not matter. Scientists have used this strategy effectively and have discovered numerous *genes that lengthen life span* (Martin, Austad, & Johnson, 1996; Finch & Tanzi, 1997). One way to find *longevity genes* more rapidly is to use short-lived species like nematodes and fruit flies, and such approaches have proven immensely successful (Longo & Finch, 2003; Tatar, Bartke, & Antebi, 2003). Using the nematode *C. elegans*, more than a dozen labs have now reported life-extension genes. About 200 different gene mutants have been reported to extend its life span. The record for life-span extension is held by *C. elegans* and now stands at more than seven-fold, using both environmental and genetic interventions (Houthoofd, Braeckman, Johnson, & Vanfleteren, 2003). *Genes for life extension* are found mainly in 2 "pathways:" those encoding genes that function in the mitochondrion, and genes specifying a signal-transduction pathway leading from an insulin-like signaling molecule to its transcription factor (*daf-16*) and beyond, to include as many as several hundred genes that are activated or repressed by DAF-16 (Tatar, Bartke, & Antebi, 2003; Rea & Johnson, 2003).

Maximizing Life Span

There are no proven methods, interventions, or technologies on the market to dramatically improve life span. Many unscrupulous "scientists" are trying to make money off the human desire to extend one's life and each year market several billion dollars' worth of unproven and almost certainly ineffective—if not downright dangerous—methods for extending life (Olshansky, 2002). There are only 2 examples of drug treatments to maximize longevity, and both of these were in nematodes. One reported only modest success, but the other almost doubled life expectancy and maximum life span in the best experiments (Melov, Ravenscroft, Malik, Gill, Walker, Clayton, et al., 2000).

Assuming that you want to extend your life (as Woody Allen says) by "not dying," rather than through your children or your works, what should you do? Choosing long-lived parents is currently the best method of ensuring longevity (Finch & Tanzi, 1996), but there is not much one can do to ensure that the genes received from one's parents were the best possible, and interventions to rectify hereditary defects are probably several decades away. However, there is much a person can do to maximize the effect of the genes they *do* have: avoid unhealthy habits, like smoking, excessive use of drugs such as alcohol, narcotics, marijuana, or pharmaceuticals, avoid overeating and consuming foods with excess fat, and get regular exercise. You may wish to take dietary supplements, such as an *aspirin daily*. There are no magic bullets (yet). The advice changes, and it is best to stay up to date (several Web sites for information include the *American Federation for Aging Research* at www.infoaging.org/, the National Institute on Aging at www.nih.gov/nia/, and the Gerontological Society of America at www.geron.org/).

Evolution of Longevity

Evolution cares little about how long an individual actually lives. Indeed, after the end of reproduction, an organism—be it mouse or human—can no longer contribute to the evolutionary pool in a direct way, so there is little reason to think that evolution would select for individuals who live well past the age of reproduction. Moreover, since most organisms die from infection, accident, or predation in the wild, most scientists working on aging think that there is no selection for a program that kills the organism. Instead, genes that regulate longevity function to do other things as well, and their effects on longevity are secondary to these other actions (Finch, 1990; Rose, 1990; Martin, Austad, & Johnson, 1996). Other processes sometimes associated with aging are programmed, including *programmed cell senescence* (also called the *Hayflick limit*) and programmed cell death (*apoptosis*). These processes can be eliminated completely in the lab, but no one has turned a mortal organism into an immortal one.

One part of us, however, is immortal: our germ line. But the indefinite life of the germ line does not mean that any biological component in the process is really immortal. The somatic part of the germ line wears out. Men accumulate mutations in their sperm. Women go through menopause. Cessation of female fertility is not something that is unique to humans; numerous other species also show a cessation of reproduction in females late in life (Ricklefs & Finch, 1995). Numerous arguments have been put forward arguing that menopause provides advantages to humans over evolutionary time periods; there is little direct support for this notion and certainly no need that it be true. Modern medical interventions have already extended the reproductive life of women into their 60s using a variety of *in vitro* fertilization technologies and appropriate hormone treatments.

The Future

Many companies are trying to extend life by creating drugs that lead to life prolongation and slower rates of aging. It was shown recently that life extension can be achieved by drug treatment, at least in invertebrates (Melov, Ravenscroft, Malik, Gill, Walker, Clayton, et al., 2000). This is a natural extension of the genetic approach, using life span as a marker. Such a strategy could possibly lead to drugs that lead to life prolongation and slower rates of aging, but for now this still seems a distant pipe dream. The production of such drugs, however, could be common within several decades.

THOMAS E. JOHNSON

See also
Life Expectancy

REFERENCES

Allard, M., Lèbre, V., & Robine, J.-M. (1998). *Jeanne Calment from Van Gogh's time to ours* (translated). New York: W. H. Freeman & Co.

Finch, C. E. (1990). *Senescence, longevity, and the genome*. Chicago: University of Chicago Press.

Finch, C. E., & Tanzi, R. E. (1997). Genetics of aging. *Science, 278,* 407–411.

Houthoofd, K., Braeckman, B. P., Johnson, T. E., & Vanfleteren, J. R. (2003). Dietary restriction does not use the Ins/IGF-1 signaling life-extending pathway in *C. elegans*. *Experimental Gerontology, 38,* 947–954.

Johnson, T. E. (2005). Genes, phenes and dreams of immortality: The 2003 Kleemeier Award lecture. *Journal of Gerontology: Series A: Biological Sciences and Medical Sciences, 60,* 680–687.

Johnson, T. E., & Wood, W. B. (1982). Genetic analysis of the life span of *Caenorhabditis elegans*. *Proceedings of the National Academy of Sciences, U.S.A. 79,* 6603–6607.

Longo, V. D., & Finch, C. E. (2003). Evolutionary medicine: From dwarf model systems to healthy centenarians? *Science, 299,* 1342–1346.

Martin, G. M., Austad, S. N., & Johnson, T. E. (1996). Genetic analysis of ageing: Role of oxidative damage and environmental stresses. *Nature Genetics, 13,* 25–34.

McCay, C. M., Maynard, L. A., Sperling, G., & Barnes, L. L. (1939). Retarded growth, life span, ultimate body size and age changes in the albino rat after feeding diets restricted in calories. *The Journal of Nutrition, 18,* 1–13.

Melov, S., Ravenscroft, J., Malik, S., Gill, M. S., Walker, D. W., Clayton, P. E., Wallace, D. C., Malfroy, B., Doctrow, S. R., & Lithgow, G. J. (2000). Extension of life span with superoxide dismutase/catalase mimetics. *Science, 289,* 1567–1569.

Olshansky, J. S., Carnes, B. A., & Butler, R. N. (2001). If humans were built to last. *Scientific American, 284,* 50–55.

Perls, T. T., & Silver, M. H. (1999). *Living to 100: lessons in living to your maximum potential at any age*. New York: Basic Books.

Rea, S., & Johnson, T. E. (2003). A metabolic model for determination of longevity in the nematode *Caenorhabditis elegans*. *Developmental Cell, 2,* 197–203.

Ricklefs, R. E., & Finch, C. E. (1995). *Aging, a natural history*: New York: Scientific American Library.

Rose, M. R. (1990). *Evolutionary biology of aging*. Oxford: Oxford University Press.

Tatar, M., Bartke, A., & Antebi, A. (2003). The endocrine regulation of aging by insulin-like signals. *Science, 299,* 1346–1351.

Vaupel, J. W., Carey, J. R., Christensen, K., Johnson, T. E., Yashin, A. I., Holm, N. V., Iachine, I. A., Kannisto, V., Khazaeli, A. A., Liedo, P., Longo, V. D., Zeng, Y., Manton, K. G., & Curtsinger, J. W. (1998). Biodemographic trajectories of longevity. *Science, 280,* 855–860.

Weindruch, R., & Walford, R. L. (1988). *The retardation of aging and disease by dietary restriction*. Springfield, IL: Charles C. Thomas Publisher.

LIFE REVIEW

In 1963, Robert Butler postulated that reminiscence in the aged was part of a normal life review process brought about by the realization of approaching dissolution and death. It is characterized by the progressive return to consciousness of past experiences and particularly the resurgence of unresolved conflicts for reexamination and reintegration. If the reintegration is successful, such reminiscence can give new significance and meaning to life and prepare the person for death by mitigating fear and anxiety.

This evaluative process of the life review is believed to occur universally in all persons in the final years of their lives, although they may not be totally aware of it and may in part defend themselves against realizing its presence. It is spontaneous, unselective, and seen in other age groups as well (e.g., adolescence, middle age), especially when individuals are confronted by death or a major crisis, but the intensity and emphasis on putting one's life in order are most striking in old age. In late life, people have a particularly vivid imagination and memory for the past and can recall with sudden and remarkable clarity early life events. They often experience a renewed ability to free-associate and to bring up material from the unconscious. Individuals realize that their own personal myth of invulnerability and immortality can no longer be maintained. All this results in a reassessment of life, which, depending on the individual, may bring depression, acceptance, or satisfaction.

The life review can occur in a mild form through mild nostalgia, mild regret, a tendency to reminisce or tell stories, and the like. Often the life story will be told to anyone who will listen. At other times, it is conducted in monologue in private and is not meant to be overheard. It is in many ways similar to the psychotherapeutic situation in which a person is reviewing his or her life in order to understand present circumstances (Haight & Webster, 1995).

As part of the life review, one may experience a sense of regret that is increasingly painful. In severe forms, it can lead to anxiety, guilt, despair, and depression. And in extreme cases, if a person is unable to resolve problems or accept them, terror, panic, and suicide can result. The most tragic life review is one in which a person decides that his or her life was a total waste.

Some of the positive results of a life review can be the righting of old wrongs; making up with enemies; coming to accept one's mortality; and gaining a sense of serenity, pride in accomplishment, and a feeling of having done one's best. Life review gives people an opportunity to decide what to do with the time left to them and work out emotional and material legacies. People become ready to die, although they are in no hurry. Possibly the qualities of serenity, philosophical development, and wisdom observable in some older people reflect a state of resolution of their life conflicts. This is usually accompanied by a lively capacity to live in the present, including the direct enjoyment of elemental pleasures such as nature, children, forms, colors, warmth, love, and humor. Some become more capable of mutuality, with a comfortable acceptance of the life cycle, the universe, and the generations. Creative works may result, such as memoirs, art, and music. People may put together family albums and scrapbooks and study their genealogies.

Research and Best Practices

Since Butler proposed life review theory in 1963, there has been an intense interest in life review and reminiscence for older adults. There has been some confusion surrounding the two mental processes because life review and reminiscence are often used interchangeably and inconsistently in the literature. There has been an effort among researchers to define the concepts and improve study methodologies to understand the phenomena. Whereas life review is defined as systematic and more evaluative in nature, reminiscence is part of and can facilitate life review. Researchers have described reminiscence as a rubric with several different functions and representative of different reminiscence phenomena (Haight & Webster, 1995). Webster (1993) developed the Reminiscence Function Scale to help classify the different types of reminiscence. The reliable and valid 43-item Likert-type scale questionnaire assesses how often the individual reminisces as well as the type of reminiscence function, such as boredom-reduction, problem solving, teaching, intimacy maintenance, conversation, identity, death preparation, and bitterness revival.

Researchers have also examined the effects of life review and reminiscence on quality of life outcomes, such as decrease in depression and anxiety, and increase in life satisfaction and self-esteem (Haight & Webster, 2002). Other researchers have postulated that younger adults such as nursing students engaging in integrative reminiscence with an older adult learn about and appreciate the life of the individual and thus decrease feelings of ageism. Interventions that promote reminiscence between older adults and nursing students facilitate interactions that increase trust and communication so that students are able to effectively gather information regarding older adults' health beliefs, coping skills, and cultural perspectives (Shellman, 2004, 2006).

Research of life review and reminiscence has led to the realization that facilitating reminiscence as part of the life review with an older adult has benefits for the one reminiscing as well as the one listening. Incorporating group reminiscence sessions in nursing homes and senior centers, educating nursing students to facilitate reminiscence with their patients, and encouraging families to be part of this process are just some of the best practices that can be used wherever an individual is receiving care. Even though life review and reminiscence research is still in its definitive stages, it is becoming increasingly clear that facilitating these reflective processes has the potential to improve the quality of life for older adults and to keep their legacies alive.

JULIETTE SHELLMAN

See also

Communication Issues for Practitioners
Creativity
Patient–Provider Relationships

Internet Resource

The International Institute for Reminiscence and Life Review

http://www2.uwsuper.edu/cee/lll/IIRLR/oview.htm

REFERENCES

Butler, R. N. (1963). The life review: An interpretation of reminiscence in the aged. *Psychiatry*, *26*, 65–76.

Haight, B., & Webster, J. (Eds.) (1995). *The art and science of reminiscing: Theory, research, and applications*. Washington, DC: Taylor and Francis.

Haight, B., & Webster, J. (Eds.). (2002). *Critical advances in reminiscence work*. New York: Springer Publishing Company.

Shellman, J. (2004) Understanding life experiences of African American elders. *Journal of Transcultural Nursing*, *15*, 308–316.

Shellman, J. (2006). Making a connection: BSN students' perceptions of their reminiscence experiences with elders. *Journal of Nursing Education*, *45*(12), 497–503.

Webster, J. D. (1993). Construction and validation of the Reminiscence Function Scale. *Journal of Gerontology: Psychology Sciences*, *48*, P256–P262.

LONG-TERM-CARE FINANCING: INTERNATIONAL PERSPECTIVE

Two opposing views characterize how long-term care (LTC) should be financed. One is the residual, safety-net model, which places the primary responsibility with the individual or family. Under this model, the state assumes a role in financing LTC only when the family cannot provide support and when the individual has exhausted all assets. The other view is the entitlement model, in which the state provides for LTC as a basic human right, regardless of the availability of family support and assets. Among the developed countries, the United States has taken the former view, whereas the Scandinavian countries have taken the latter. Other countries lie somewhere in between; however, many countries are refocusing their policies toward the entitlement model. Germany in 1995 and Japan in 2000 initiated public LTC insurance; Scotland introduced free personal care in 2002.

The reason for this shift lies in demographic and social changes. The "oldest old" population (i.e., age 80 and older) and the number of "elderly households" have grown dramatically, and this trend will accelerate in the future, not only in the developed countries but also in the developing countries (World Health Organization, 2002). However, the number of female relatives, who traditionally provided the bulk of informal care, has been decreasing. At the same time, the proportion of women of working age who are in paid employment has been increasing (Royal Commission on Long Term Care, 1999). The magnitude of these changes is likely to outpace any decreases in burden that may result from the compression of morbidity and the improvement in functional status of the elderly. Moreover, there is growing awareness that the existing health care and social services systems should be integrated to provide LTC efficiently. An independent LTC system is needed because LTC benefits must be set in a middle ground between the egalitarian standards in health care and the minimum level in public assistance.

In the United States, expanding private LTC insurance has been advocated as a way to reconcile these two opposing models of public versus private responsibility. However, the problems associated with private health insurance become magnified in LTC. Those in greatest need, the elderly, are the least likely to be able to afford it. Therefore, people would have to enroll when they are comparatively young and at low risk, and premiums would have to be paid until they become old and at high risk. However, if they stop paying, they forfeit all rights to benefits. For the insurers, there are the problems of moral hazard, adverse selection, and the difficulty of predicting overall costs (Organization for Economic Cooperation and Development [OECD], 1996). Because of these reasons, Germany rejected the idea of expanding private LTC insurance.

Public funding for LTC can take two forms: taxes and social insurance. Because social insurance takes the form of mandatory payroll deductions (as in Medicare), there may appear to be little difference between the two. However, social-insurance contributions are reserved solely for the provision of specific services. Therefore, they tend to be more fiscally stable and more sheltered from the general economic situation. They are also less progressive than taxes (i.e., the contribution ratio is fixed, regardless of income level). Moreover, these differences in funding may lead to real differences in the provision of LTC. Under a tax-based system, the LTC services tend to be targeted toward those having less informal support or lower incomes. Care managers employed by the local government decide on the services for each individual, and providers are usually given a monopoly in the community in which they operate. In contrast, under a social-insurance system, benefit levels are determined by explicit eligibility criteria based on functional and/or cognitive performance. Thus, they are set irrespective of the amount of informal support or income, although premiums or co-payments may be waived for those with low incomes.

Whether a country opts for a tax or social-insurance model is largely determined by the existing administrative structure. Countries such as Denmark, Sweden, Norway, and the United Kingdom, which finance their health care through taxes, also finance LTC this way. In contrast, Germany, Austria, and Japan rely on social insurance for health care and LTC. However, the accessibility of LTC services is likely to be a function of the absolute amount of resources available. Sweden, with public spending for LTC amounting to 2.74% of gross domestic product (GDP) has a much higher level of LTC provision than Germany, which spends only 0.95% (OECD, 2005). The high spending in Sweden has been justified on the grounds of normalization and improving the quality of life. Thus, these aspects need to be considered when evaluating the justification for providing community services, not just the prevention of nursing-home admissions and reduction of public expenditures. If the public sector does not pay for an adequate level of LTC, its costs will be borne in the private sector by the daughters or spouses who become exhausted providing care or by the rapid spend-down of a lifetime of savings.

For publicly financed LTC programs to obtain popular support, they must be perceived to be fair (Campbell & Ikegami, 2000; Ikegami & Campbell, 2002). In a tax-based system, there needs to be implicit trust in the competence and integrity of the care managers to decide who is going to get which amount of benefits. Because individual needs must be balanced with the constraints of the total budget, this is a difficult task. In a social insurance system, where the amount of benefits is determined by explicit eligibility criteria, the way in which the classification program is designed and administered is important. For example, the integrity and competence of the people who decide on eligibility must be assured, the reliability of the assessment procedure should be high (so that similar cases produce similar results), and the categories must be logically delineated and understandable. In both systems, there must be mechanisms for monitoring the eligibility process and for appeals of adverse decisions.

NAOKI IKEGAMI

See also

Future of Care
Long-Term-Care Policy
Medicaid
Medicare
Medicare Managed Care
Pensions and Financing Retirement

Internet Resources

Organization for Economic Cooperation and Development
http://www.SourceOECD.org

REFERENCES

Campbell, J. C., & Ikegami, N. (2000). Long-term-care insurance comes to Japan. *Health Affairs 19*(3), 26–39.

Campbell, J. C., & Ikegami, N. (2003). Japan's radical reform of long-term care. *Social Policy and Administration*, *37*, 21–34.

Ikegami, N. (2007). Rationale, design and sustainability of long-term care insurance in Japan: In retrospect. *Social Policy and Society*, 37.

Ikegami, N., & Campbell, J. C. (2002). Choices, policy logics and problems in the design of long-term-care systems. *Social Policy and Administration*, *36*, 719–734.
OECD (1996). Caring for frail elderly people: Policies in Evolution. Paris: OECD.
OECD (2005). The OECD health project: Long-term care of older people. Paris: OECD.
Royal Commission on Long Term Care (1999). Available at: http://www.open.gov.uk/royal-commission-elderly/index.html
World Health Organization (2002). Lessons for long-term-care policy. Available at: http://www.who.int/ncd/long_term_care/index.htm

LONG-TERM-CARE POLICY

Long-term care depends heavily on public financing from Medicaid, Medicare, the Department of Veterans Affairs, and state-funded programs (U.S. Congressional Budget Office, 2004). Thus, public policy changes may have a big impact on providers and consumers. Policy issues address financing, the balance between institutional and noninstitutional services, quality of care, and workforce.

Increasing Financial Burden

The need for long-term-care services affects persons of all ages, but the prevalence of disability increases sharply with age. The U.S. Census Bureau (2004) projects that the population age 85 and older, the population most likely to need long-term-care services, will increase from 4.3 million in 2000 to 20.9 million in 2050. About half of all persons age 85 and older have a disability in the community or are in a nursing home. Although there appears to have been a decline in disability rates among the older population during the last 20 years, the large increase in the number of older people due to the aging of the baby boom generation ensures that the demand for long-term-care services will rise over time.

With the increase in the number of people using long-term care, the financial burden will increase, and how to address those rising expenditures is a matter of considerable policy concern. According to the U.S. Congressional Budget Office (2004), total (i.e., public and private) long-term-care expenditures for older people are projected to increase from 1.3% of the gross domestic product (GDP) in 2000 to 1.5% to 2.0% of GDP in 2040. Although a large percentage increase, these changes are relatively modest in absolute terms. Moreover, many other countries, such as Sweden, Japan, Germany, and England, already have populations that are much older than ours without unduly dire results.

Balance Between Institutional Care and Home- and Community-Based Services

Historically, nursing-facility care has been the predominant long-term-care service covered with public funds. However, there are widespread policy initiatives at the federal and state level to shift the balance of publicly covered services toward home- and community-based services. Noninstitutional services increased from 14% of total Medicaid long-term-care services (for both older and younger persons) in 1991 to 35% in 2004 (Burwell, Sredl, & Eiken, 2004).

The movement toward more home- and community-based services has been bolstered by the 1999 ruling of the U.S. Supreme Court in *L.C. & E.W. vs. Olmstead.* Interpreting the Americans with Disabilities Act, the Court established a limited right to home- and community-based services. Although this right is not unlimited and may be bound by state fiscal limits, consumer advocacy groups across the country have used the Court's decision to push for more home- and community-based services.

Although people prefer home- and community-based services, it is not clear that increasing home- and community-based services will reduce total long-term-care expenditures. Even when per-person average home- and community-based services costs are less than facility care, the large increase in the number of people using services can offset any reductions in nursing-home use. The existing research literature, almost all of it based on data more than 20 years old, found that expanding home- and community-based services did not reduce aggregate long-term-care expenditures (Weissert & Hedrick, 1994). However, these findings may not hold because long-term care has changed dramatically in recent years. There are new service strategies with cost-savings potential, especially regarding Medicaid home- and community-based services waivers, including increased attention to targeting those most at risk of institutionalization, imposing caps on average expenditures, and covering a wide range of lower cost services.

As part of the increasing role of home- and community-based services, policy makers have expanded consumer-directed care and use of less restrictive congregate living options, such as assisted living. In both the United States and Europe, publicly funded, consumer-directed home-care models give consumers, rather than home-care agencies, control over who provides services, when they are provided, and how the services are delivered.

Residential-care alternatives to nursing facilities include adult foster care, board and care homes, and assisted-living facilities. Policy makers and older people hope that these facilities will be able to provide services in a more home-like environment that provides greater personal autonomy and more personal choice than nursing homes. Although most residential-care-facility residents pay privately, Medicaid and Supplemental Security Income are increasingly important sources of payment. The number of Medicaid beneficiaries receiving long-term-care services in group residential settings outside of nursing homes increased from 40,000 in 1998 to 121,000 in 2004 (Mollica & Johnson-Lamarche, 2004).

Quality of Care in Long-Term Care

Concerns about poor quality of care by nursing homes and other long-term-care providers in the United States are long-standing and continue today (U.S. Government Accountability Office, 2005). One of the key policy rationales for expanding home- and community-based services is that the quality of life for beneficiaries is better than in nursing homes. However, little is known about the quality of home- and community-based services, even though increasing numbers of people are receiving paid care in those settings. Although people who use home care typically report high levels of satisfaction, measuring and ensuring quality of care in the home and community setting is at a fairly early level of development compared to nursing-home care. Recent newspaper accounts of poor quality of care in assisted-living facilities have increased concern about the care provided in those settings.

Strategies to improve quality can be broadly grouped into three categories. Increasing mandatory external pressure on providers to improve quality of care includes strengthening the regulatory process and strengthening the long-term-care workforce (e.g., requiring minimum staffing ratios in nursing homes). Increasing voluntary external incentives to improve quality of care include providing consumer information on quality of care, increasing support for consumer advocacy, and changing Medicare and Medicaid reimbursement. Voluntary strategies by providers to directly change their internal operations include promoting practice guidelines and changing the organizational culture.

Workforce

Paraprofessional long-term-care workers, such as certified nurse assistants, home health aides, and personal care attendants, are the backbone of the formal long-term-care delivery system, providing the majority of paid assistance to people with disabilities. These “frontline” workers help people by assisting with activities of daily living, such as eating, bathing, and dressing, and instrumental activities of daily living, such as medication management and meal preparation. The central role of these workers in providing “hands on” services makes them the key factor in determining the quality of paid long-term care.

Long-term-care providers report unprecedented labor vacancies and turnover rates reaching crisis proportions. These shortages are likely to worsen over time in the face of increased demand for services. Recruitment and retention of long-term-care workers is a major challenge, with high rates of turnover and occupational exit. As a result of high turnover and vacancy rates, providers incur substantial recruitment and training costs and there may be an increased risk of reduced quality of care.

The low status, low pay, and lack of benefits associated with these direct-care jobs have negative implications for job satisfaction. Paraprofessional long-term-care workers receive low wages and are often poor. Median earnings of personal and home-care aides was only $8.75 per hour in 2003 (U.S. Bureau of Labor Statistics, 2003). Many home-care aides work part-time, further reducing their earnings. In addition, these workers have low rates of health-insurance coverage and access to pension plans (Yamada, 2002).

Conclusion

Long-term care is an important policy issue that affects billions of dollars in public expenditures and millions of people with disabilities. As the baby boomers become elderly, long-term care will rise on the national political agenda. The near-term aging of the parents of the baby boomers and their need for nursing-home and home care may raise the policy profile of this issue sooner rather than later.

JOSHUA M. WIENER
EDITH G. WALSH

See also

Long-Term-Care Financing: International Perspective
Medicare
Medicaid
Medicare Managed Care
Veterans and Veteran Health

Internet Resources

AARP Public Policy Institute
http://www.aarp.org/research/longtermcare/

Administration on Aging
http://www.aoa.gov/prof/prof.asp

American Health Care Association Health Services
http://www.ahca.org/research

Clearinghouse for the Community Living Exchange Collaborative
http://www.hcbs.org/

Centers for Medicare and Medicaid Services/New Freedom Initiative
http://www.cms.hhs.gov/NewFreedomInitiative/

Kaiser Family Foundation
http://www.kff.org/medicaid/longtermcare.cfm

The Commonwealth Fund
http://www.cmwf.org/topics/topics.htm?attrib_id=11989

REFERENCES

Burwell, B., Sredl, K., & Eiken, S. (2004). Medicaid long-term-care expenditures in FY 2003: Memo. Cambridge, MA: Medstat, May 11.

Mollica, R., & Johnson-Lamarche, H. (2005). *State residential care and assisted living policy: 2004*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

U.S. Bureau of Labor Statistics (2003). *National occupational employment and wage estimates, healthcare support occupations*. Washington, DC Available at http://www.bls.gov/oes/current/oes_31he.htm.

U.S. Census Bureau (2004). *Projected population of the United States, by age and sex: 2000 to 2050*. Available at http://www.census.gov/ipc/www/usinterimproj/.

U.S. Congressional Budget Office (2004). *Financing long-term care for the elderly*. Washington, DC.

U.S. Government Accountability Office (2005). *Nursing homes: Despite increased oversight, challenges remain in ensuring high quality care and resident safety* (GAO-06-117). Washington, DC.

Weissert, W. G., & Hedrick, S. C. (1994). Lessons learned from research on effects of community-based long-term care. *Journal of the American Geriatrics Society*, *42*(3), 348–353.

Yamada, Y. (2002). Profile of home care aides, nursing home aides, and hospital aides: Historical changes and data recommendations. *Gerontologist*, *42*(2), 199–206.

LOW VISION

Low vision is the term used to describe vision loss that cannot be improved with medical or surgical intervention or the use of conventional eyeglasses or contact lenses. Although most of the diseases that affect the eye may result in low vision, the most common diseases in older adults are cataracts, macular degeneration, diabetic retinopathy, and glaucoma. These diseases and others such as retinitis pigmentosa, corneal dystrophies, optic atrophy, histoplasmosis, toxoplasmosis, and neurologic disorders cause characteristic functional effects for people who experience them. There are three categories to consider: diseases that cause a loss of central vision (e.g., macular degeneration), diseases that cause a loss of peripheral vision (e.g., glaucoma and retinitis pigmentosa), and diseases that result in an overall blurring of the visual field (e.g., cataracts and corneal problems). Diabetic retinopathy may result in defects in all three of these categories (Faye, 2000).

Patients' abilities to perform everyday tasks are affected by the type of vision loss they manifest. For example, a person with a loss of central vision due to macular degeneration may have difficulty reading regular print or seeing faces, whereas a person with retinitis pigmentosa and a loss of peripheral vision may do those tasks with relative ease but be hampered in getting around safely.

People with low vision may or may not be "legally blind." Although important for determining eligibility for state and federal benefits of different types, "legal blindness" is an arbitrary characterization. The widely used definition of legal blindness is best corrected visual acuity in the better eye of 20/200 or less, or a visual field of 20° or less in the better eye. However, this definition does not accurately express a patient's functional visual ability and tells the clinician little about whether the person can use vision for daily tasks. More inclusive definitions have been in use in recent years, such as the following from the World Health Organization (1993):

> A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 20/60 to light perception or a visual field of less than 10° from the point of fixation, but who uses or is potentially able to use, vision for the planning and/or execution of a task.

Using any cut-off point for acuities in the normal range may omit people who have relatively normal vision but contend with a constricted field of vision. Current clinical models of vision rehabilitation also recognize that reduced contrast perception is responsible for many patients' lack of proficiency in carrying out activities of daily living (ADL), even when visual acuity is relatively good and/or stable. The prevalence of vision impairment increases with age, as follows:

- 15% of Americans ages 45 to 64 years report some form of vision impairment, representing 9.3 million persons.
- 17% of Americans ages 65 to 74 years and older report some form of vision impairment, representing 3.1 million persons.
- 26% of Americans age 75 years and older report some form of vision impairment, representing 4.3 million persons (The Lighthouse, Inc., 1995). (Note: Percentages have been applied to Census 2000 population estimates to arrive at the number of persons reporting vision problems.)

According to studies using clinical measures to examine the prevalence of vision impairment among nursing-home residents, estimates of vision impairment range from 21% to 52% (Horowitz, Balistreri, Stuen, & Fangmeier, 1995; Marx, Feldman, Werner, & Cohen-Mansfield, 1994; Morse, O'Connell, Joseph, & Finkelstein, 1988).

Difficulty with visual tasks should never be blamed on "age" (Faye & Sussman-Skalka, 2002). Any patient who demonstrates functional limitations should be referred for a low-vision evaluation; careful evaluation of functional loss along with introduction of appropriate optical and/or adaptive devices or compensatory skills is a critical step toward improving patients' performance. The earlier the vision rehabilitation begins, the better is the adaptation to loss of sight (Faye & Fischer, 2006).

Low-vision examinations are conducted by ophthalmologists and optometrists who have received specialized training in this field; many other skilled professionals are essential in enhancing patient performance, including occupational therapists, vision rehabilitation therapists, low-vision therapists, orientation and mobility specialists, nurses, opticians, and paraprofessionals. Low-vision and vision-rehabilitation care is available in a variety of settings: private practices of ophthalmology or optometry, vision-rehabilitation agencies, colleges of optometry, hospitals, and Office of Veterans' Affairs programs (Albert et al., 2000) and is of increasing importance in home care.

A comprehensive low-vision examination includes the following:

- A detailed *ocular and medical history* that sets the stage for the potential effect the eye disease may have on the functional vision of the patient. A task-related history highlights the deficits and strengths of the patient in terms of what the patient wants or needs to be able to do with the current level of vision loss.
- *Measurement of visual function* that utilizes specialized tests. As a rule, the testing of visual acuity, contrast sensitivity, glare, the central and peripheral visual fields, and color identification provide the critical information needed to establish the patient's level of function.
- *Calculation of the predicted near vision "add"* that estimates the magnification needed for near work beyond the patient's full distance correction.
- *Presentation of optical devices* that complement the patient's needs and skills. These may be spectacles, loupes, hand or stand magnifiers, telescopes, and electronic devices.
- *Instruction in optical and nonoptical device use* and training in compensatory strategies needed for ADL.
- Guidance regarding *environmental modifications* in the home or workplace.
- *Referral* for additional services, such as orientation and mobility to learn safe travel skills or social work counseling to deal with psychosocial issues.

There is significant potential for depression among older adults with low vision. In a recent study of visually impaired elders age 65 and older, rates of both major and subthreshold depression among participants were higher than those found among general samples of community-based elders (Horowitz, Reinhardt, & Kennedy, 2005.

Similar findings resulted from other earlier longitudinal studies of older adults with impaired vision designed to document the prevalence and incidence of major depression among older people with impaired vision and to examine the relationships between depression and disability. Almost 40% of visually impaired older people in the study were found to have major depression. About 30% of those with macular degeneration in the second eye became depressed within 6 months of being diagnosed. The relationship of depression to disability was stronger than that between depression and vision loss (Rovner, Zisselman, & Shmuely-Dulitzki, 1996).

Low-Vision Devices

In addition to an accurate and up-to-date refraction, most low-vision patients will require magnification to accomplish tasks. Enhancement of contrast, improved illumination, and glare control are also relevant strategies to consider. Magnification can be achieved for patients in a variety of ways: by moving closer to the object of regard (relative distance magnification); by enlarging the size of the object (relative size magnification), or by using an optical system (angular magnification) (Rosenthal, 1991).

Low-vision optical devices include spectacles, loupes, hand or stand magnifiers, telescopes, absorptive lenses, and electronic devices that offer varied features and a wide range of dioptric power. Device recommendation is not trial and error; it is based on the type and degree of visual function loss, the tasks the person wishes to perform, and other factors that might limit the types of devices that can be used, such as the presence of a hand or head tremor, weakness or visual field loss from a stroke, or cognitive impairment (Faye & Fischer, 2006. Optical limitations inherent in lenses and lens systems may also result in some restrictions in use. For example, it is often surprising to patients to learn that the strong magnifier they seek will have a smaller surface area, smaller field of view, and shorter working distance. Unfortunately, no single device does everything for the patient with low vision, and clinicians must often prescribe more than one variety of device to cover the range of a patient's needs.

Working with magnifying lenses also presents demands that may be difficult or stressful for the older person. Patients must learn to synchronize the magnifier and reading material with task lighting and accessory items such as inclined, raised reading stands. The guidance of skilled professionals such as low-vision therapists, occupational therapists, and vision-rehabilitation therapists facilitates successful use of prescribed low-vision devices. Nonoptical items such as bold ruled paper, signature and check-writing guides, medication organizers, dark felt tip pens, liquid level indicators, two-color cutting boards, "talking" watches and clocks, sewing aids, and labeling/marking materials may be introduced to make everyday tasks easier and safer for patients to do independently. Presentation of these helpful tools, instruction in device use, and training of visual skills are essential to provide comprehensive care. In addition, older patients and their family members benefit from learning effective strategies to modify the environment, including enhancing contrast to make objects stand out against their backgrounds, using color to highlight environmental features (Arditi, 2002), using effective lighting, and using tactile markings.

Visual function increases in importance as the options for activities for older persons become more restricted. Low-vision care and vision rehabilitation—important at any age—can mean the difference between isolation and remaining in touch with visual pleasures and daily necessities, affecting all aspects of an older person's quality of life. Whether through the use of optical or nonoptical devices, mobility aids, compensatory skills training, environmental modification, or counseling, there is almost always something that can be done for the person with low vision.

ELEANOR E. FAYE
KAREN R. SEIDMAN

See also
Cataracts
Eye Care Providers
Glaucomas
Vision Changes and Care
Vision Safety

Internet Resources

American Academy of Ophthalmology
http://www.eyenet.org

American Foundation for the Blind
http://www.afb.org

American Optometric Association
http://www.aoanet.org

Lighthouse International
http://www.lighthouse.org

National Eye Institute
http://www.nei.nih.gov

VisionConnection
http://www.visionconnection.org

REFERENCES

Albert, D.M., & Jakobiec, F.A. (Eds.). (2000). Principles and Practice of Ophthalmology. 2nd ed. Toronto: W.B. Saunders.

Arditi A. (2002). Web accessibility and low vision. *Aging & Vision*, *14*(2), 2–3.

Faye, E. E. (2000). *Functional consequences of vision impairment:. The lighthouse handbook on vision impairment and vision rehabilitation. 2 vols*. New York: Oxford University Press.

Faye, E. E., Albert, D. L., Freed, D., Seidman, K., & Fischer, M. (2000). *The Lighthouse ophthalmology resident training manual: A new look at low vision care*. New York: Lighthouse International.

Faye, E. E., & Fischer, M. (2006). Vision rehabilitation for the visually impaired. In B. F. Boyd & H. Lewis

(Eds.), *Highlights of Ophthalmology International Series, Vol. II, ARMD*. Panama: Highlights of Ophthalmology.

Faye, E. and Sussman-Skalka, C.J. (2002). Vision loss is not a normal part of aging; open your eyes to the facts. New York: Lighthouse International.

Horowitz, A., Balistreri, E., Stuen, C., & Fangmeier, R. (1995). Visual impairment and rehabilitation needs of nursing home residents. *Journal of Visual Impairment & Blindness*, *89*(1), 7–15.

Horowitz, A., Reinhardt, J. P., & Kennedy, G. J. (2005). Major and subthreshold depression among older adults seeking vision rehabilitation services. *American Journal of Geriatric Psychiatry*, *13*, 180–187.

Marx, M. S., Werner, P., Feldman, R., & Cohen-Mansfield, J. (1994). The eye disorders of residents of a nursing home. *Journal of Visual Impairment and Blindness*, 88(5), 462–468.

Morse, A. R., O'Connell, W., Joseph, J., & Finkelstein, H. (1988). Assessing vision in nursing home residents. *Journal of Vision Rehabilitation*, *2*(3): 5–14.

Rosenthal, B. P. (1991). The structured low vision evaluation. In R. London, B. P. Rosenthal, & R. G. Cole (Eds.), *Problems in optometry: A structured approach to low vision care* (pp. 385–393). Philadelphia: J.B. Lippincott Company.

Rovner, B. W., Zisselman, P. M., & Shmuely-Dulitzki, Y. (1996). Depression and disability in older people with impaired vision: A follow-up study. *Journal of the American Geriatrics Society*,. *44*(2), 181–184.

The Lighthouse, Inc. (1995). *The Lighthouse national survey on vision loss: The experience, attitudes and knowledge of middle-aged and older Americans*. New York: The Lighthouse, Inc.

World Health Organization (1993). Available at: http://www.who.int/chronic_conditions/en/

M

MANAGED CARE

See
Medicare Managed Care

MEALS ON WHEELS

Any discussion about providing comprehensive care to today's and tomorrow's elderly would be incomplete without a serious look at the role Elderly Nutrition Programs (ENPs) play in enhancing independence and quality of life. There is sufficient evidence to demonstrate that ENPs improve the nutritional health of the individuals who participate in the programs. Improvement of nutritional status, in turn, can both postpone premature institutionalization for individuals and reduce costs associated with the federal Medicare and other health care programs. Improving or maintaining nutritional health of older individuals is extremely important, particularly in the context of recent studies that identify poor nutritional status and physical inactivity as the second leading cause of death—behind smoking—in the United States.

Meals On Wheels is a generic term often used to describe elderly nutrition programs. Although it is easy to understand how all ENPs came to be lumped into a single category widely recognized by the general public (namely, "Meals On Wheels"), there is more to Meals On Wheels than that name implies. First, elderly nutrition programs consist of two distinct types of services: (1) home-delivered meal programs (i.e., Meals On Wheels); and (2) congregate meal programs—that is, those available in facilities, such as senior centers, where several seniors assemble and partake of meals together. These two types of nutrition programs are similar in purpose, but there are differences—some obvious, some subtle—between both the program types themselves and the populations each serves. To receive services in both settings, individuals must be age 60 or older. Because demand far outstrips available services, programs are targeted, by law, to those in "greatest economic and social need."

The Older Americans Act (OAA) is both the principal law governing operation and practices of ENPs and provides the largest source of federal funding. As mandated by OAA, the primary objective, shared by home-delivered and congregate meal programs, is to furnish hot, nutritious meals to needy seniors at least 5 days per week. Each meal must meet the minimum standard of furnishing at least one-third of the Recommended Dietary Allowances (RDA) of key nutrients. Most meals actually exceed this RDA minimum, approximating 40% to 50% of the daily requirement and, typically, the meals are "nutrient dense"—that is, their ratios of nutrients to calories are high. As a result, the daily intake of key nutrients is greater for program participants than it is for similar individuals who do not participate in the program.

Providing meals is not the only benefit or service that ENPs provide. More than half of all programs provide nutrition screening and education, and more than a third include nutrition assessment and counseling. These services are expected to expand in the future as the understanding of their importance increases. Some ENPs are either adding wellness-related services or partnering with other community-based organizations to coordinate these services. The federal government is encouraging such expansion and recently entered into a Cooperative Agreement with the Meals On Wheels Association of America (MOWAA) to provide more than $2 million toward research and demonstrations designed to create a coordinated continuum of care from traditionally disparate social services and health care delivery systems. Ideally, this continuum will move seniors toward wellness by augmenting meal services with other wellness services such as falls prevention, immunizations, and other health promotion.

ENPs provide program participants with "more than just a meal." Although it is accomplished in different ways and to a different degree in congregate sites and in the home, socialization—or at least the reduction of social isolation—is a critical benefit that all ENP participants enjoy. Those participating in both types of senior meal programs have more social contact than similarly situated nonparticipants. This is true despite the fact that compared with the general elderly population, individuals who participate in the programs are more than twice as likely to reside alone.

Other than setting, programs differ in the demographic characteristics of program participants. In both cases, program participants are older, predominantly female, more likely to be minority, and are poorer than the overall eligible population (i.e., U.S. elders age 60 and older). Home-delivered meal recipients, on average, are older, poorer, and frailer than their counterparts in congregate programs. For example, nearly 59% of home-delivered participants have three or more chronic medical conditions, compared with 41% of the congregate population. Additionally, the majority of homebound participants are unable to perform at least one or more Activities of Daily Living/Instrumental Activities of Daily Living (ADL/IADL).

Clearly, ENPs cannot affect some profile factors, such as age and income level. Other characteristics, however, can be and are directly improved through nutrition or nutrition-related interventions. Weight is one such factor. Body mass index (BMI) can be tied to nutritional status and affected by nutritional intervention. BMI outside the normal range places individuals at risk for a number of chronic conditions. Almost two-thirds of all the individuals who participate in ENPs are at increased risk of health and nutritional problems because they are either over- or under-weight. "Nutritional status has been shown to affect the age-related rate of functional decline for many organs and to be a determinant of changes in body composition associated with aging, such as loss of bone and lean body mass. Furthermore, diet and nutrition have been related to the etiology of many chronic diseases affecting elderly people, such as osteoporosis, atherosclerosis, diabetes, hypertension, and certain forms of cancer" (Ponza, Ohls, & Millen, 1996).

This relationship between diet and nutrition and chronic conditions is good news for the elderly who participate in ENPs and for the nation as a whole. Nutritional intervention, alone and in combination with appropriate physical activity (strength and balance training, and moderate aerobic exercise) is associated with reduced risk for chronic disease outcomes, including their complications and associated disability, and increased years of healthy living in elders (ages 65 to 74).

One of the principal assets of the ENP is that it has evolved throughout the years, responding to changing population needs and incorporating scientific and technological advances. As the ENP has expanded its services and its reach into communities, the benefits have become increasingly profound.

Demographic realities foretell that demand for the services of ENPs will increase. Program history demonstrates ENPs can be sensitive and responsive to the changing and growing needs of an ever-burgeoning cohort of aging Americans. However, the degree to which ENPs can contribute to the improving health of America's seniors relies on public support—in the form of federal, state, and local funding; financial contributions from individuals, the corporate sector, and foundations; and the investment of time and personal resources of volunteers, who prepare, serve, and deliver meals. ENPs are one of the most prudent, low-cost investments the public sector can make. The cost of providing a senior citizen "Meals On Wheels" for 1 year is roughly equivalent to the cost of 1 hospital day for a Medicare patient.

What originally may have appropriately functioned primarily as a meal program, the ENP has today truly become "more than a meal" program. ENPs need to be viewed and to view themselves as a national resource, as well-established and cost-effective entities through which to administer a broad range of nutrition services and interventions. Health promotion and disease prevention are natural and positive consequences of appropriate and relatively inexpensive nutrition interventions. The prevention, reduction, and/or postponement of onset of chronic diseases in the elderly can enhance quality of life, delay individual institutionalization, and reduce overall national health care costs.

The Administration on Aging (AoA), the federal agency responsible for overseeing ENPs funded through the OAA, states that there are approximately 4,400 ENPs throughout the United States today. The Eldercare Locator, which can be accessed toll-free from anywhere within the United States by dialing 1-800-677-1116, can assist seniors and their caregivers in locating a senior meal program in the community. Similar information can be accessed at www.mowaa.org.

Enid A. Borden
Margaret B. Ingraham

See also
Nutritionists
Senior Centers

Internet Resources
Administration on Aging
http://www.aoa.org

Meals On Wheels Association of America
http://www.mowaa.org

REFERENCES

Ponza, M., Ohls, J. C., & Millen, B. E. (1996). *Serving elders at risk: The Older Americans Act nutrition programs*. Washington, DC: U.S. Department of Health and Human Services, Administration on Aging and Office of the Assistant Secretary for Planning and Evaluation.

MEASUREMENT

The current health care climate increasingly demands that providers utilize quality indicators and measurable outcomes such as assessment tools, scales, and indices in their practices. These tools, scales, and indices make it possible for health care providers to prove their effectiveness in clinical, administrative, and financial areas. Therefore, the current era of accountability has stimulated the development of many standardized tools for assessment and evaluation purposes and has raised awareness of the imperative to provide empirical (i.e., observable) evidence that has objective, scientific credibility to assess, identify, or determine the extent of a phenomenon, event, or concept. The process of using empirically sound scales, tools, and indices to examine a phenomenon, event, or concept is called *measurement*. This discussion focuses on this aspect of the concept. Although not a focus of this discussion, *measurement* may also refer to the process of observing and recording observations that are collected as part of a research study.

Measurement is commonly understood as the process of assigning numerical values to concepts, phenomena, or events. Numerical values are objective (as opposed to subjective) in nature and thereby enhance the reliability and validity of the information: every event or phenomenon with an assigned number is similar to others with the same assigned number. For the clinician, the availability of measurement or assessment tools is invaluable because the instruments have been developed and evaluated to determine their level of creditability (i.e., reliability) and soundness (i.e., validity).

Determining the reliability and validity of a particular instrument is extremely important. *Reliability* is defined as the extent to which the instrument yields the same results on repeated measures. It is concerned with consistency, accuracy, and precision; if the same person is tested several times, the same score will result. *Validity* refers to whether a measurement instrument actually measures what it is supposed to measure. Reliability and validity are complex concepts to measure in and of themselves; sophisticated statistical methods are routinely used to establish the reliability and validity of assessment tools and other forms of measurement.

There are several general guidelines to follow when considering which tools to use in clinical practice. Tools that have been used repeatedly and with different groups are usually reliable. In many instances, the creator of a scale or index provides a "score" or statistical coefficient to summarize the level of confidence of the measure. Many different statistical techniques are used for these purposes. As a general rule, the higher the score, the more confidence one should have in the measure (e.g., 0.83 reflects strong confidence, 0.53 moderate confidence; typically, a score under 0.50 is unacceptable).

Types of Measurement

Scale

One of the most familiar forms of measurement in health care is the scale, which provides an easy method for measuring the magnitude of a phenomenon or event. Scales frequently use ordinal or interval levels of measurements. Examples include a patient's pain assessment using a scale of 0 to 10 or a customer satisfaction survey that uses a Likert scale: 1 = very satisfied, 2 = satisfied, 3 = not satisfied, 4 = very unsatisfied.

Checklist

Another common measurement tool is the checklist approach, which can be used when collecting information on types of procedures performed. These tools frequently use nominal levels of measurement—for example, numbers may be assigned to represent steps in the procedure, such as 1 = inserted IV, 2 = drew blood, 3 = removed Foley catheter, and so forth. These numerical values make it possible to aggregate or group the responses in a meaningful way. It is then possible to *assess* similarities and differences between responses or groups of responses. These assessments are conducted through scoring data and the performance of statistical analyses.

There is an important difference, however, between the numerical values associated with, for example, a pain scale and the numerical values assigned to steps in a procedure. With regard to the checklist of procedures, the assignment of numbers is arbitrary. There is no intrinsic value to the 1, 2, or 3. This measurement uses *nominal* data, data that are purely for categorization or classification purposes. In contrast, the numbers used in the pain scale have intrinsic value: a score of 1 means less pain than 2, and 0 means no pain. A pain score of 8 is understood as twice as painful as a score of 4. The pain scale is an example of ratio measurement—rankings on a scale with equal intervals between numbers and an absolute zero. When investigating an instrument for possible use, clinicians should be aware of whether data are scale or nominal, because such differences may have implications for the tool's ease of use and interpretation for clinical staff at all levels.

Ordinal and interval

Ordinal measures show the relative ranking of people, objects, or events. The classic example of ordinal data is the class ranking of students. One student is ranked higher than another, but the actual difference between the students may differ more widely than the ranking. Interval data also provide a means of ranking, but the zero point is not arbitrary. The most familiar use of interval measurement is the Fahrenheit thermometer.

Interpretation of Numerical Values

The primary benefit of measuring people, phenomena, and events using numerical values is the ability to quantify the results using statistical methods. Hence, it is important to distinguish between the different types of measures and data, because the statistical options used are related to the type of measurement used.

The most basic statistical methods used to interpret numerical data are called measures of central tendency, and they describe the "middle" or the "average" of the group of responses. The *mean* (score) is the arithmetic average of all the numerical responses. The *median* is the middle score, or the number at which 50% of the responses are above it and 50% are below it. The *mode* is the most frequent score or response. It is possible to have more than one mode.

Each measure of central tendency is suitable for different types of data. The mean is commonly used for establishing averages for ordinal, interval, and ratio data, such as test scores or analyzing height and weight data among clients. However, the median is more appropriate for data that have a wide range, such as salaries, or for developing quartiles. Modes are most suitable for nominal data.

Selecting an Assessment Tool in Geriatrics

Standardized assessment tools permit practitioners to assess, evaluate, and measure where a particular patient fits on any number of clinical, administrative, and educational variables. Once a patient has been assessed, the practitioner can proceed with appropriate interventions. There are many good measures in geriatrics. However, before selecting a particular measure, it is necessary to evaluate its appropriateness for one's specific needs.

First, the practitioner must decide what exactly he or she wants to measure and determine who or what is being measured. For example, is it the needs of a patient with a particular diagnosis, the evaluation of a program, or staff satisfaction? If a type of person is being assessed, is it a specific diagnosis, age group, or patients in a particular setting? In addition, the clinician must decide how much detail he or she wants or needs from a measurement tool. It is important to balance the pros and cons of using more detailed instruments, which are more time-consuming, or using shorter measures that may provide less detail but are more efficient.

When selecting an appropriate measure, clinicians should get as much background information as possible about the development and application of the instruments. This information is often available in the published literature. When reviewing the written material, it is important to examine the size of the group on which the instrument was tested and the type of population on which the instrument was used. Ideally, the clinician should select a measure that has been used extensively with the same population he or she plans to assess. In short, if the clinician plans to assess nursing-home residents, it would be best to use a measure developed for this population rather than selecting one for home care or acute care.

Evaluating the validity and reliability of a measurement tool can be difficult. It is useful to know how many tests were performed on the instrument to determine its reliability and validity. It is also helpful to know how many different users have tested the instrument and how large the groups of respondents were.

Finally, the user should consider the method for scoring and interpreting the results when selecting a tool. Difficult scoring methods and complicated statistical interpretations can be too time-consuming for a busy clinician. In some cases, copy-written instruments may require a fee for scoring and interpreting the results.

The utility and benefit of standardized measurement tools in health care are obvious to any clinician, administrator, educator, or researcher. In a health care environment that emphasizes clinical standards and quality outcomes, in addition to regulatory compliance and fiscal responsibility, reliable and valid measures, indices, scales, and surveys are critical to providing quality health care. Whether for clinical decision making, quality performance and improvement activities, or research purposes, there is little doubt that all health care providers will be involved in measurement activities in their daily practices.

PERI ROSENFELD

See also

Measuring Physical Function

Multidimensional Functional Assessment: Overview

Internet Resources

Health and Psychosocial Instruments (HAPI) Database
http://www.ovid.com/site/products/ovidguide/hapidb.htm

Try This: Best Practices in Care for Older Adults
http://www.hartfordign.org/resources/education/tryThis.html

MEASURING PHYSICAL FUNCTION

Choosing an appropriate test to measure physical functioning can be a daunting task for physicians, nurse practitioners, and physical and occupational therapists. The need to utilize objective, reliable, and valid measures of physical function cannot be overstated. Assessment of a person's physical performance should be included in any evaluation. It is important for health care providers to select appropriate physical measures of functional performance for the geriatric population. The selection of appropriate measures of gait and balance are important for determining the effectiveness of reducing morbidity in the geriatric population. Measures of physical performance are utilized to determine fall risk, mobility limitations, and activities of daily living (ADL). These physical function measures lead to intervention, which might include referral to social services for community-based resources or to an occupational or physical therapist.

The physical performance measures were chosen because they are reported to be valid and reliable assessment tools, can be performed in any clinical setting, require no special equipment, are easy to administer; and can be performed by non-skilled personnel. They are the timed up and go test (TUG) (Podsiadlo & Richardson, 1991), Tinetti gait and balance test, (Tinetti, 1986), 6-minute walk test, the functional reach test (Duncan, Weiner, Chandler, & Studenski, 1991), the Physical Performance Test (Reuben & Siu, 1990), and the Berg Balance Scale (Berg, Wood-Dauphinee, Williams, & Gayton, 1989).

Timed Up and Go Test

The TUG measures mobility, balance, and motor performance in patients with rheumatoid and osteoarthritis, and deconditioned community-dwelling elderly. The TUG test is performed by timing individuals as they stand from an 18-inch chair, walk 3 meters, turn 180 degrees, return to the chair, and sit down. The score on this test is the time it takes in seconds to complete the task. The test takes 2 to 3 minutes to complete. Inter-rater reliability, criterion, and construct validity are high, correlating well with laboratory and clinical measures of gait and balance. A score of less than 10 seconds is normal. A score of more than 30 seconds indicates assisted mobility and risk for falls.

Tinetti Gait and Balance Test

The Tinetti gait and balance scale, also referred to as the Performance-Oriented Assessment of Mobility (POMA), identifies mobility impairments. It utilizes an ordinal scale, made up of two sections. The balance section rates the ability to maintain postural stability during various activities (e.g., sit-to-stand transfers, standing balance, turning 360 degrees). The gait section consists of mobility tasks, such as initiation of gait, step length, step height, and path deviation. Both sections are scored on a scale of 0 to 2. The maximum score is 28/28. It takes approximately 10 minutes to complete and is widely used in a variety of clinical settings, with diversified patient populations. It has been shown to be a reliable instrument with good sensitivity. A score of less than 19/28 indicates fall risk.

The 6-Minute Walk Test

The 6-minute walk test (6MWT) assesses exercise tolerance among individuals with respiratory disease and has been tested in groups of community-dwelling elderly, individuals with fibromyalgia and total hip arthroplasty, in which content, criterion, and construct validity have been established. It measures the distance covered during 6 minutes. The patient may stop and rest as many times as necessary, and the total distance walked is recorded. Normative data for the 6-minute walk test distance reported by Enright and Sherrill (1998). were 576 meters for men (median age 59.5) and 494 meters for women (median age 62.0).

Functional Reach Test

The functional reach test (Duncan et al., 1990) is a clinical test of balance addressing limits of postural stability. It quantifies the maximal distance one can reach forward beyond arm's length (in the horizontal plane) while maintaining a fixed base of support in the standing position. Reliability, criterion, concurrent construct, and predictive validity of the functional reach have been established. The functional reach test correlates well with other measures of balance, mobility, ADL, and risk of falls. A reach performed at less than 6 inches is a high risk for falls. A reach performed greater than 12 inches without external support is normal.

Physical Performance Test

The Physical Performance Test (PPT) (Reuben & Siu, 1990) is a performance-based global measure of physical performance used to identify ADL and IADL deficits in frail and well community-dwelling elderly, as well as institutionalized older adults. It requires minimal equipment and no specific training beyond the instructions accompanying the test, which can be administrated in 10 minutes, depending on the client's level of ability. There are two versions, one with seven items (i.e., write a sentence, simulate eating, lift a book to a shelf, put on and remove a jacket, pick up a penny from the floor, turn 360 degrees, walk 50 feet) and one with nine items (addition of climbing one flight of stairs up to four flights).

Scoring is based on time for all scores with two exceptions: turning 360 degrees (scored for continuity and stability) and climbing multiple flights of stairs (scored based on the number of flights). The timed component can be used to demonstrate decline over time and thus guide intervention or show response to an intervention such as rehabilitation services. Use of the PPT in a home-health setting demonstrated that a score of about 17 indicated that patients were no longer homebound (Crews, Brown, & Norton, 1997).

Berg Balance Scale

The Berg Balance Scale (BBS) monitors patient status over time and has been utilized to evaluate the effectiveness of rehabilitation intervention. (Berg et al.,1989). It has also been used to predict the probability of falls for community-dwelling older adults (Shumway-Cook, Baldwin, Polissar, & Gruber, 1997).

The BBS consists of 14 common tasks and takes 15 to 20 minutes to administer. The 14 items are combined for a total score, which can range from 0 to 56, with a higher score indicating greater fall risk. Examples of some of the tasks include standing unassisted with variations, turning neck, turning 360 degrees, reaching forward, and picking up an object from the floor. There are various timed, distance, and supervision requirements for each task. Minimal equipment is required. The BBS demonstrates excellent sensitivity to change. Reliability and validity have previously been established. Measures of physical function utilizing performance-based measures should be a part of the routine evaluation by medical professionals to establish a baseline of physical performance. Once the performance-based measures have been obtained, they are utilized to guide treatment and establish a plan of care.

Sandra B. Ganz

See also

Gait Assessment Instruments
Multidimensional Functional Assessment: Instruments
Multidimensional Functional Assessment: Overview
Occupational Therapy Assessment and Evaluation
Physical Therapy Services

Internet Resources

Alison Hunter Memorial Foundation—Measurement of Functional Status
http://www.ahmf.org/database/measurement.html

Center to Improve Care of the Dying—Functional Status
http://www.gwu.edu/~cicd/toolkit/function.htm

REFERENCES

Berg, K., Wood-Dauphinee, S., Williams, J. L., & Gayton, D. (1989). Measuring balance in the elderly: Preliminary development of an instrument. *Physiotherapy Canada 4*(6), 304–311.

Crews, L., Brown, M., & Norton, B. J. (1997). Effectiveness of the physical performance test for detecting and monitoring changes in functional status in elderly patients receiving home physical therapy services. St. Louis, MO: Unpublished Master's Thesis, Washington University.

Duncan, P. W., Weiner, D. K., Chandler, J., & Studenski, S. (1990). Functional reach: A new clinical measure of balance. *Journals of Gerontology. Series A*, *45*(6), M192–M197.

Guyatt, G., Sullivan, M. J., Thompson, P. J., Fallen, E. L., Pugsley, S. O., Taylor, D. W., et al. (1985). The 6-minute walk: A new measure of exercise capacity in patients with chronic heart failure. *Canadian Medical Association Journal*, *132*, 919–923.

Podsiadlo, D., & Richardson, S. (1991). The timed "Up & Go": A test of basic functional mobility for frail elderly persons. *Journal of the American Geriatrics Society*, *39*(2), 142–148.

Reuben, D. B., & Siu, A. L. (1990). An objective measure of physical function of elderly outpatients: The physical performance test. *Journal of the American Geriatrics Society*, *38*, 1105–1112.

Shumway-Cook, A., Baldwin, M., Polissar, N. L., & Gruber, W. (1997). Predicting the probability for falls in community-dwelling older adults. *Physical Therapy*, *77*(8), 812–819.

Tinetti, M. E. (1986) Performance-oriented assessment of mobility problems in elderly patients. *Journal of the American Geriatrics Society*, *34*(2), 119–126.

MEDICAID

Medicaid was enacted in 1965 as Title XIX of the Social Security Act to assist states in paying for the health care of the very poor. By setting minimum standards, Medicaid was designed to give states flexibility in their programs but also to ensure that some specific groups of people would be assisted and that some core services would be provided across the country. Eligibility is therefore based on both falling into a "categorically needy" eligibility group and meeting a financial needs test. To qualify for Medicaid, individuals must usually be aged, blind, disabled, or a member of a single-parent family with dependent children. People who meet the categorical requirements must also have income and assets below specified levels. People whose income is too high but who face relatively high medical expenses may also become eligible for Medicaid by "spending down" to a state-set eligibility standard. Recipients of adoption or foster-care assistance and pregnant women and children whose family income falls below 133% of the federal poverty level are also eligible.

States have a tremendous amount of latitude in determining the administrative structure, scope of covered services, how much and by what method providers will be paid, how they will calculate income and assets, and whether optional categories of benefits will be covered. Consequently, each of the 50 states, the District of Columbia, and the five American territories has a different Medicaid program. Someone who is eligible in one state might not be eligible in another state. States receive federal matching funds for every dollar spent on Medicaid services. The precise federal match, or participation rate, is inversely related to the state's fiscal capacity (based primarily on per capita income), ranging from no more than 77% for the poorest states to no less than 50% for the richest states.

In 2003, approximately 52.4 million people were enrolled in Medicaid. Children accounted for the largest proportion—48%—of enrollees, followed by adults in families (27%), nonelderly blind and disabled (16%), and the elderly (9%). Medicaid spending (both federal and state) totaled $266.1 billion in 2003; the federal government financed approximately 57% and the remainder was financed by states. Although children and adults in families comprised the largest proportion of enrollees, they tend to have fewer health needs relative to low-income elderly and nonelderly disabled beneficiaries; therefore, they incur a relatively smaller proportion of Medicaid expenditures. During 2003, Medicaid expenditures were incurred by children (19%), adults in families (12%), the nonelderly disabled (43%), and elderly Medicaid enrollees (26%) (Smith et al., 2005).

Mandatory health services provided under Medicaid include inpatient and outpatient hospital care, physician services, laboratory and X-ray services, primary and preventive care, nursing-facility and home health care, and other medically necessary services. In addition, states have the option of providing additional covered services, such as prescription drugs, dental services and dentures, rehabilitation services, intermediate-care facilities for individuals with mental retardation, and personal care services to individuals in noninstitutional settings. For individuals enrolled in both Medicare and Medicaid (i.e., the dually eligible population), Medicaid covers cost-sharing related to the Medicare Part B Premium, deductibles, and co-payments, as well as some health-related services that are not covered by Medicare. In 2003, Medicaid provided supplemental health coverage for about 7.5 million Medicare beneficiaries. Although those individuals who were dual-eligible for both Medicare and Medicaid accounted for only 14% of all Medicaid enrollees, they incurred 40% of overall Medicaid expenditures (Kaiser Family Foundation, 2005). Approximately two-thirds of overall Medicaid spending for the dual-eligible population was related to long-term-care services.

In fact, Medicaid spent approximately $83 billion on long-term-care services in 2003. This represents nearly half (47.4%) of what was spent nationally on long-term care, making Medicaid the single largest source of long-term-care financing. Individuals who require long-term-care services are quite diverse, and Medicaid's beneficiary population receiving long-term-care services reflects this diversity, including older adults with age-related physical and cognitive impairments, children and adults with mental retardation and developmental disabilities, individuals with severe mental illness, individuals with traumatic brain and spinal cord injuries, and individuals with debilitating illnesses. Medicaid coverage of long-term care varies substantially across groups of enrollees. For example, according to Congressional Budget Office estimates, during 1998, Medicaid covered about one-third of all long-term-care services among aged beneficiaries but about 60% of long-term-care–related spending among nonelderly persons with disabilities. Medicaid spending for long-term care is predominantly used for institutional care, although there has been growing interest and use of home- and community-based services.

Medicaid was originally tied to eligibility for other public assistance programs such as Aid to Families with Dependent Children (AFDC) and Supplemental Security Insurance (SSI) cash-assistance programs. However, beginning in 1984, a series of expansions in Medicaid coverage reflected a significant shift in the philosophical underpinnings of the program. In 1984, changes were made to provide coverage to pregnant women before their receipt of AFDC to ensure the coverage of prenatal care. In 1989, Medicaid eligibility was expanded to cover pregnant women and children, and the link to other public assistance programs was dropped entirely. In 1990, federal law expanded Medicaid coverage to children under the age of 6 and pregnant women whose income is below 133% of poverty (at a minimum) are now covered, as well as children ages 7 to 19 whose family income is less than 100% of poverty. The State Child Health Insurance Program (SCHIP) was created under the Balanced Budget Act in 1997. The SCHIP, also known as Title XXI of the Social Security Act, enables states to initiate and expand health care to uninsured, low-income children. States may either create a new health insurance coverage program that defines the amount, duration, and scope of benefits or expand eligibility for children under the state's current Medicaid program, or both.

Although there have been no expansions to Medicaid eligibility criteria in recent years, the program has continued to experience rapid increases in enrollment and expenditures, largely due to unfavorable economic conditions and a loss of access to employer-sponsored health coverage among families. As a result, enrollment increases have predominantly occurred among nondisabled adults and children. Overall program spending increased by approximately $70 billion, or about 13.4%, annually during 2000 through 2003. However, annual spending per enrollee increased at a much lower rate of

6.1%, which highlights the substantial impact of enrollment increases as a key contributor to program costs during this period (Kaiser Family Foundation, 2005).

Although the majority of Medicaid services were traditionally delivered on a fee-for-service basis, managed care has been increasingly integrated into Medicaid. States have long been able to enroll Medicaid beneficiaries voluntarily into managed care, and the 1997 Balanced Budget Act afforded states greater ability to expand managed care within Medicaid—including the ability to mandate enrollment in managed care for most categories of beneficiaries (excluding dual eligibles, some children with special needs, and Native Americans). Between 1991 and 2000, the number of Medicaid beneficiaries enrolled in managed-care plans increased from 2.7 million to 18.8 million (The Kaiser Family Foundation, 2001). By 2001, more than half (i.e., 56%) of all Medicaid beneficiaries were enrolled in managed-care plans, with managed-care enrollment predominantly concentrated among low-income children and nondisabled adults.

In response to rising Medicaid costs, state budgetary constraints, and federal efforts to reduce spending, states have been actively experimenting with a variety of mechanisms to hold down program costs. Cost-containment efforts vary by state, but restricting provider payments, controlling expenses related to prescription drugs, and disease management are widely being implemented as well as, on a more limited basis, increases in cost sharing and cuts in benefits and eligibility. The high costs of long-term care along with growing interest in integrating individuals with disability in the community have led states to experiment with new models of providing long-term care in the home and in the community rather than in nursing homes. Waiver programs that afford states the flexibility to expand home- and community-based services in a more limited way have been expanded in recent years. By 2002, these waiver programs accounted for nearly 20% of overall long-term-care spending, an increase from just 4% in 1990 (Burwell, 2003). Some states are experimenting with managed care for their dually eligible Medicare beneficiaries with long-term-care needs.

One unique managed-care program for frail older adults is the Program of All-Inclusive Care for the Elderly (PACE), which features a comprehensive medical and social services delivery system financed by integrated Medicare and Medicaid dollars. The Balanced Budget Act (BBA) of 1997 established PACE as a permanent entity within the Medicare program and as a state option under the Medicaid program. PACE allows people age 55 and older who meet their state's eligibility criteria for nursing-home care to receive all Medicare and Medicaid services in an adult day health center, at home, or in an inpatient facility. A capitated financing system allows providers to deliver all the services needed by PACE enrollees rather than only those that are reimbursable under the Medicare and Medicaid fee-for-service systems.

JENNIFER L. WOLFF
CHARLES BOULT

See also

Long-Term-Care Financing: International Perspective
Long-Term-Care Policy
Medicare Managed Care
Pensions and Financing Retirement
Program of All-Inclusive Care for the Elderly (PACE)

Internet Resources

Centers for Medicare and Medicaid Services Homepage
http://www.cms.hhs.gov/home/medicaid.asp

Centers for Medicare and Medicaid Services PACE homepage
http://www.cms.hhs.gov/PACE/

HCFA 2082 Report (abstract)
http://www.cms.hhs.gov/home/medicaid.asp

Kaiser Family Foundation
http://www.kaiserfamilyfoundation.org/medicaid/index.cfm

REFERENCES

Burwell, B. (2003). Medicaid Expenditures for long-term-care services, 1990–2002. Available at http://hcbs.org/hcbs_data.htm

Kaiser Family Foundation (2001, December). Medicaid and managed care. Available at http://www.kff.org

Kaiser Family Foundation (2005, July). Dual eligibles: Medicaid's role for low-income Medicare beneficiaries. Available at http://www.kff.org

Smith, V. L., Gifford, K., Ellis, E., Wiles, A., Rudowitz, R., & O'Malley, M. (2005, October). Medicaid budgets, spending and policy initiatives in state fiscal years 2005 and 2006: Results from a 50-state survey. Available at http://www.kff.org/

MEDICARE

Medicare was enacted in 1965 as Title XVIII of the Social Security Act. This federal program of health insurance was originally developed to provide health coverage for persons age 65 or older who are eligible for Social Security benefits. In addition, in 1972, the program was extended to people under age 65 who were entitled to federal disability benefits for at least 2 years and to certain individuals with end-stage renal disease. Medicare was enacted in response to a growing awareness of the need to help older persons obtain and pay for necessary medical care. In the early 1960s, only about half of older Americans had any health insurance (compared with 75% of those under 65). Those seeking to purchase private coverage were often denied on the basis of age or preexisting conditions or found private insurance unaffordable (Moon, 1993).

Medicare is a national program (administered regionally by private insurance companies) that pays for medical care provided by private health care providers. Eligibility is linked to Social Security through workforce participation (either employment or through marriage) and, unlike Medicaid, is not subject to any tests of financial need. Today, the Medicare program covers approximately 42 million Americans. Most beneficiaries are elderly, with about 15% of beneficiaries under the age of 65.

Medicare expenditures in 2004 totaled $309 billion (Centers for Medicare and Medicaid Services, 2005). Of this amount, about 38% went toward inpatient hospital care; another 18% for physician services; 7% for outpatient hospital services; and 22% for skilled nursing care, post-acute home health care, medical equipment, and other professional services; and the remaining 15% was disbursed to managed-care plans to provide Medicare-covered services. Administrative costs of the program are generally about 2% of total program expenditures.

Traditional Medicare is really two programs: hospital insurance (known as Part A) and supplementary medical insurance (known as Part B). Medicare Part A is financed by current workers and their employers through a payroll tax (1.45% each), and beneficiaries who age into the program are automatically enrolled at the time that they begin to receive Social Security benefits. Although most beneficiaries choose to participate in both Medicare Parts A and B, participation in Part B is voluntary. Part B is financed through a different payment mechanism than Medicare Part A. One-quarter of the Part B premium is paid by the beneficiary (typically deducted from their monthly Social Security payments), with the remainder financed through general tax revenues. In 2006, the monthly Part B premium was $88.50.

In 1997, Congress passed legislation that added an array of new managed-care and other health plan choices to the Medicare program. In this program, known as Medicare Advantage, the Medicare program pays managed-care plans a fixed monthly amount per enrollee to cover the same basic benefits package as offered under the traditional program. Enrollees in Medicare Advantage plans pay the monthly Medicare Part B premium and may, depending on the health plan, also be responsible for additional out-of-pocket monthly premiums. Enrollment in these types of plans has fluctuated greatly throughout the past 10 years; in 2005, it represented approximately 12% of Medicare beneficiaries.

The 2003 Medicare Prescription Drug, Improvement, and Modernization Act (MMA) established a new prescription drug benefit, known as Medicare Part D. Since January 2006, beneficiaries may voluntarily enroll in private Medicare Part D prescription drug plans. Monthly Part D premiums were expected to average $35 in 2006. As with Medicare Part B, general funds from the U.S. Treasury finance costs beyond beneficiary premiums and cost-sharing. Although Medicare provides significant coverage for beneficiaries' health care services, it only covers, on average, about one-half of beneficiaries' total health care expenses. Beneficiaries age 65 and older spent $3,142 in out-of-pocket health care costs (excluding long-term care), or about 22% of average per capita income in 2000 (Maxwell, Moon, & Segal, 2001). The largest sources of out-of-pocket expenses have historically been for services not covered by Medicare—most notably, extended long-term care (e.g., nursing-home care beyond 100 days, assisted-living facility care, or supportive services in private homes) and outpatient prescription drugs. Co-payments and deductibles, particularly for multiple hospital admissions, can also be considerable. Other relatively common services not covered by Medicare include most routine physical examinations, most patient education, most activities related to coordination of care, nonsurgical dental services, hearing aids, and eyeglasses.

Most Medicare-covered services are subject to cost-sharing and time constraints. For example, after beneficiaries have paid their deductible (i.e., $952 in 2006) Medicare Part A pays for inpatient hospital care in the first 60 days of each benefit period (i.e., the period associated with one acute illness). For days 61 and beyond, beneficiaries are responsible for co-payments of $238 per day until day 90; for stays beyond 90 days in a benefit period, an insured person may elect to draw on a 60-day lifetime reserve that requires a co-payment of $476 per day. Following a hospitalization of at least 3 days, Part A will cover up to 100 days of skilled nursing care or skilled rehabilitation services; however, only the first 20 days in the skilled nursing facility are free from cost-sharing.

Part B of Medicare pays 80% of physicians' "reasonable charges" for most covered services in excess of an annual $124 deductible (50% for most outpatient mental health services). Covered services include medically necessary physician services, laboratory and other diagnostic tests, X-ray and other radiation therapy, outpatient services at a hospital or comprehensive outpatient rehabilitation facility, rural health clinic services, home dialysis supplies and equipment, prostheses (other than dental), physical and speech therapy, and ambulance services. A number of screening tests and preventive services were added to Part B benefits starting in the 1990s, and in 2003 a one-time general physical was added for all newly enrolled Medicare beneficiaries.

To augment the health care coverage provided by Medicare, most beneficiaries carry supplemental health insurance in addition to Medicare. Some beneficiaries purchase private supplemental policies, called Medigap plans, to cover coinsurance, co-payments, and deductibles for Medicare services. Historically, retiree benefits have also provided supplemental health care coverage, although there is evidence—and concern—that these benefits are eroding. Some low-income beneficiaries are dually eligible for both Medicare and Medicaid, and state Medicaid programs pay the Medicare Part B premiums and all other deductibles and co-payments for Medicare-covered services.

Efforts to control Medicare costs have taken many forms over the years. Notable among those endeavors are revised approaches to provider payment that have shifted Medicare away from cost reimbursement toward prospective payment to providers. These new payment systems are intended to encourage provider efficiency by providing incentives to manage the care of patients within a fixed budget. Legislation enacted in 1983 created the prospective payment system for hospital services, which sets limits on hospital reimbursement for inpatient procedures by establishing a set amount to be paid based on an assigned diagnosis-related group for each hospital stay. In 1993, the method by which physicians were paid was revamped, and a national fee schedule was adopted. Physicians are paid a fixed amount according to the "resource-based relative value" of each service, which is computed from estimates of the resources used to generate the service. Due in part to changes to hospital payments, Medicare experienced tremendous growth in post-acute expenditures from the mid-1980s through the mid-1990s, and in 1997 the Balanced Budget Act mandated prospective payment systems for both home health care and skilled-nursing-facility services.

The 2003 MMA enacted the most widespread changes to Medicare since its inception. In addition to creating Medicare Part D, the MMA called for means-testing Part B premiums, the addition of several new screening and preventive health services as covered benefits, and numerous initiatives to improve chronic care. Although these changes are positive steps toward bringing Medicare's benefit package in line with contemporary standards for its beneficiary population, several issues remain. In particular, the fiscal challenges facing the Medicare program have grown more formidable in recent years, in large part due to demographic trends and rising costs of technology. Medicare now accounts for more than 13% of overall federal expenditures and is anticipated to comprise a growing proportion of federal outlays in the coming years. The prescription drug benefit alone is projected to cost $724 billion between 2006 and 2015. It is projected that the Part A Trust Fund will be depleted by 2020 unless changes are made to the program's benefit structure or financing.

Jennifer L. Wolff
Charles Boult

See also

Chronic Illness
Coping With Chronic Illness
Long-Term-Care Policy
Medicaid
Medicare Managed Care

Internet Resources

Centers for Medicare and Medicaid Services Homepage
http://www.cms.hhs.gov/home/medicare.asp

Kaiser Family Foundation
http://www.kaiserfamilyfoundation.org/medicare/index.cfm

REFERENCES

Centers for Medicare and Medicaid Services (2005). Medicare Trustees Report. Available at http://www.cms.hhs.gov/ReportsTrustFunds

Maxwell, S., Moon, M., & Segal, M. (2001). *Growth in Medicare and out-of-pocket spending: Impact on vulnerable beneficiaries*. Washington, DC: The Urban Institute Press.

Moon, M. (1993). *Medicare now and in the future*. Washington, DC: The Urban Institute Press.

MEDICARE MANAGED CARE

Medicare History and Benefits

The enactment of Medicare in 1965 provided government-supported health insurance and benefits for most elderly. To participate, an individual must be eligible to receive Social Security or railroad retirement benefits. The number of elderly in Medicare grew from more than 19.1 million beneficiaries in 1966 to 35.6 million in 2005, representing more than 95% of those 65 years and older.

Original Medicare Part A provided insurance for inpatient hospital stays, qualifying skilled-nursing-facility care, skilled home-health care, and hospice care. Part B helps pay the costs of physician services, outpatient hospital services, medical equipment and supplies, and other health services and supplies. All eligible adults older than 65 are entitled to Part A, but individuals must enroll and pay a monthly premium (i.e., $88.50 in 2006) for Part B coverage.

Benefits are generous but not all-inclusive. Medicare over most of its existence has not covered prescription medications, hearing aids, dental care, and most home- and community-based long-term care. Most beneficiaries purchase various supplemental insurance policies to cover some of these "gaps" in coverage and to help with co-payments. The Medicare Modernization and Drug Improvement Act of 2003 (MMA) introduced a prescription drug benefit that partially fills a prior gap covered by some supplemental policies.

Tax Equity and Fiscal Responsibility Act (TEFRA)

Initially, Medicare had limited cost controls and the combination of unanticipated demand for services and other factors placed unsustainable financial pressure on the Medicare Trust Fund. In 1982, Congress attempted to rein in escalating health care costs by passing TEFRA, which provided incentives for health maintenance organizations (HMOs) to enroll Medicare beneficiaries on an "at-risk" basis. Participating HMOs (called MMCOs) received monthly fixed capitation for their Medicare enrollees from which they had to fund all their health care expenses. Prior to capitation, HMOs received funding based on complex formulas linked to their members' use of services. Capitation plans have an incentive to manage utilization and keep spending within allocations. Capitation was set at 95% of the actuarially adjusted average per capita cost (AAPCC) of caring for a Medicare enrollee in a local county Medicare fee-for-service (FFS) market. Health plans assumed full financial risk for their Medicare members and in return received fixed monthly payments from the Health Care Financing Administration (HCFA), the Center for Medicare and Medicaid Service's (CMS) predecessor. Plans became responsible for all regulatory and administrative expenses, had to provide all Medicare-covered services, and could not request additional funds if expenses exceeded revenues.

Growth of TEFRA MMCOs began slowly but grew rapidly in the 1990s. Beneficiaries liked Medicare Managed Care (MMC) because there is virtually no paperwork, it eliminates costly supplemental Medigap insurance, has low deductibles and co-payments, and offers a rich array of extra benefits, including some prescription medication coverage, dental care, customized health club memberships, transportation, and eyeglasses. The trade-off, however, was that beneficiaries lost unrestricted choice of providers and could use only plan physicians and providers in all but urgent and emergency situations.

MMC has been very attractive to health plans in metropolitan areas, where monthly capitations were highest and there is an oversupply of hospitals and physicians. Intense competition kept beneficiary premiums and co-payments low in many areas of the country. Conversely, low reimbursement and difficulty contracting because of fewer providers made MMC less attractive in rural areas.

Scrutiny of MMCOs has focused on overpayment to the plans, use of health care dollars for marketing and profit, reducing access to care, withdrawing benefits such as prescription coverage, and enrollment biases toward low-risk seniors that favorably affects a plan's financial health. The disparity between a Medicare beneficiary receiving uncapped drug coverage in Los Angeles and a Medicare beneficiary with no access to MMC in rural Iowa created political and public policy concerns that led to modifications in the Medicare program.

The Balanced Budget Act (BBA) of 1997 and Medicare-Plus-Choice (M+C)

The BBA 1997 expanded the number of provider types that could assume primary risk by creating the M+C program. M+C expanded choice beyond traditional HMOs to include provider-sponsored organizations (PSOs) and preferred provider organizations (PPOs). The BBA changed how plans were reimbursed: they limited annual increases, established a floor rate, and introduced blended local/national rates to improve payments to low payment areas. Risk adjustment was added that takes into account enrollee health status and disease burden in calculating reimbursement. The Medicare Payment Advisory Commission believed this would stop overpayment to plans with healthier members.

A surge in medical-cost trends (including the price of drugs), contracting providers' unwillingness to assume full risk, and BBA's limits on annual rate increases made M+C unattractive to many plans. Some dropped their Medicare risk products or increased premiums and co-payments while reducing or eliminating benefits. Plan offerings became much less attractive. Enrollment figures and plan participation directly reflect these changes. In

1990, 5% of Medicare beneficiates were enrolled in MMC; by 1999, that number grew to 17%. By the end of 2004, only 12.6% of Medicare beneficiaries were enrolled in private plans.

Medicare Modernization and Drug Improvement Act of 2003 (MMA)

Since the MMA was enacted, most focus has been on its prescription drug benefit provisions, or Medicare Part D. Medicare Advantage plans must offer a drug benefit or MA-PD and implementing Part D was a monumental task accomplished in short order. MA-PDs can negotiate with drug companies on price, can eliminate deductibles, and cover the "doughnut hole." With the passage of MMA, membership in MMCOs increased to 14% due to the availability of a regional PPO and Private FFS (PFFS) options.

Medicare Advantage (MA)

MMA changed the name of the capitated Medicare from M+C to Medicare Advantage and allows four options. When Congress created the Medicare drug benefit in 2003, it also sought to generate more private plan options for senior and disabled beneficiaries in Medicare. The options are as follows:

- Medicare (MMC) Plans
- Medicare Regional PPO Plans
- Medicare PFFS Plans
- Medicare Specialty Plans (SNP)

The MA options are intended to allow greater flexibility to organizations wishing to enter into capitated Medicare and promote greater beneficiary access to MMCOs. The strategy has worked. In December 2005, there were 459 MA plans and 6.1 million, or 14% of beneficiaries, in them. MMA increased payment to MMC plans and stopped their flight from the MMC market. Beginning in 2007, plans are able to enroll new members only from January to March. People turning 65 may enroll during the enrollment cycle. Once beneficiaries join a MA plan, they are "locked in" until the next enrollment period unless specific criteria are met.

MMA requires all Medicare Advantage organizations to bid for the scope of services for Medicare beneficiaries in a designated service area. Local HMO (LHMO), Local PPO (LPPO), Special Needs Plans (SNP), and PFFS Plans submit bids at a county level, while Regional PPOs must submit bids corresponding to the CMS-designated regions (i.e., a state or multistate region). Plans must also submit bids for prescription drug benefits to offer alongside at least one of their plan designs. Medicare Advantage Plans or other entities like Pharmacy Benefit Management (PBM) organizations can submit bids for stand-alone prescription drug plans (PDPs). All bids, for Parts A, B, and D, must be submitted to CMS in June (i.e., June 5, 2006, for contract year 2007). In early August, CMS releases the Part D benchmark, which represents the weighted average of all bids submitted for PDPs. A plan's standing relative to that national Part D benchmark determines that plan member's ultimate premium. In mid-September, each plan negotiates with CMS over Plan Benefit Design for the following year.

It remains to be seen whether competitive bidding will slow the rate of Medicare expenditures. Medicare's 2010 expenditures are projected at $529 billion, compared to $295 billion in 2004. As a percentage of Gross Domestic Product, Medicare spending (i.e., Parts A, B, and D) is expected to rise steadily from 2.69% in 2005 to 3.67% in 2012 to 6.77% in 2030. These and other fiscal pressures place enormous challenges on the federal government to curb overall spending in Medicare.

MMA requires the President to submit legislation eliminating "excess" general contributions to Medicare when the Trustees project those general revenues will comprise more than 45% of Medicare spending in the next 7 years. The Congressional Budget Office projects that total Part A spending will exceed income in 2016 and the Trust Fund reserves will be exhausted by 2020. If this occurs, Medicare payments will be automatically cut to match available revenue.

Impact of MMC on Patient Care

Capitation was supposed to control costs and improve care for older people, particularly skilled nursing care, population screening and risk stratification, chronic disease management, primary care, and preventive services (Wagner, 1996). Evidence of improvement has emerged slowly and unevenly. Some data suggest that the elderly and the chronically ill do not fare as well in MMC compared with traditional fee-for-service Medicare (Ware, Bayliss, Rogers, Kosinski, & Tarlov, 1996).

Several MMCO programs facilitate higher-quality skilled-nursing-facility care models by using nurse practitioners (Reuben et al., 1999), screening and identifying at-risk seniors (Pacala, Boult, Reed, & Aliberti, 1997), running cooperative-care clinics (Scott, Gade, McKenzie, & Venohr, 1998), transitional care (Coleman et al., 2004), depression care (Unutzer et al., 2002), disease-management programs, and forging partnerships in the community. There is evidence that MMC beneficiaries have greater access to preventive services such as immunizations. A controversial study reported that non-profit managed-care plans performed better than for-profit plans in all measures, including significantly higher rates of prescribing beneficial medication after heart attack, performing annual diabetic eye examinations, and doing mammography (Himelstein, Woolander, Hellander, & Wolf, 1999).

MMA requires each MA organization to have a Chronic Care Improvement Program (CCIP). Each CCIP must identify and monitor enrollees with multiple or chronic conditions that meet severity criteria established by the organization. CCIPs must have a plan to measure the quality and health outcomes. There also must be a linkage between the CCIP and the plan's MA-PD Medication Management Treatment Program, which targets enrollees with multiple chronic conditions, receiving multiple medications, and reaching a $4,000 annual drug-cost threshold. The goal of these programs is better coordination of care for people with multiple conditions. The outcome measures of CCIPs include satisfaction and health outcomes. The regulations interpreting this part of the MMA legislation are general but the requirements for CCIPs likely will become more prescriptive as a result of annual CMS audits and plan reports.

MMA allows for the establishment of SNPs, which are intended to improve access and coordination of care for special-needs populations. SNPs are a new opportunity to integrate acute- and long-term-care services as well as Medicare and Medicaid financing. They enroll chronically ill beneficiaries living in the community or institutions, who are eligible for both Medicare and Medicaid.

Social HMOs and PACE

Two comprehensive variations of MMC are the social health maintenance organization (SHMO) and the Program of All-Inclusive Care for the Elderly (PACE).

Congress authorized the SHMO demonstration in 1984 to determine whether investing in long-term-care benefits for Medicare HMO enrollees could save money by coordinating care and providing services, thus preventing costly medical complications. SHMOs also provided personal care aides, homemakers, medical transportation, adult day health care, respite care, and community case management. Services have monthly dollar limitations and co-payments, and recipients of expanded services must meet eligibility thresholds. SHMOs receive revenues from 100% of the AAPCC, co-payments and premiums that pay for the extra services it provided. MMA calls for the end of the SHMO demonstration in 2008, and these plans may become SNP.

PACE programs provide a broad array of health and social services to enrollees who are both nursing-home and Medicaid eligible. PACE programs blend Medicare and Medicaid dollars to maintain members at home rather in nursing homes. Services are similar to those offered by SHMOs but are more intensive without dollar limits. One significant difference between the two programs is that PACE members must attend adult day health care centers several times a week; they are the hub of care and provide a number of social and health services. If a PACE member enters a nursing-care facility, the PACE site or organization pays for it. PACE has permanent status pursuant to the BBA of 1997.

CMS as Purchaser

CMS oversees and regulates traditional Medicare and MA. As its role changed from payer to purchaser, quality and reporting measures have increased. CMA gathers information about MMCOs for quality measurement and provides beneficiaries with information on benefits, premiums and co-payments, disenrollment statistics, and quality measures.

CMS contracts with the National Committee for Quality Assurance (NCQA) to report on Medicare-specific measures. NCQA is a private, nonprofit organization that assesses and reports on the quality of managed-care plans. Measures include mammography rates, prescription of beta-blockers after heart attack, percentage of board-certified physicians, and percentage of diabetics receiving retinal exams.

CMS surveys MA beneficiaries to assess satisfaction and includes items such as how well physicians communicate, how easy it is to see specialists, and the overall perceived quality of their health plans. This information is available on the Internet. Most MA beneficiaries are satisfied, but 25% say that they would not encourage a friend to join their plan.

The Future of MMC

Uncertainty about the future of MMC focuses on reimbursement. If it does not keep pace with medical inflation and cost trends, it is likely that there will be a repeat of what occurred in the late 1990s and early 2000s. The percentage of beneficiaries projected to be enrolled in Medicare Advantage plans in 2013 varies from the Congressional Budget Office's 12% to the Department of Health and Human Services' estimate of 30%.

The CMS Office of the Actuary (OACT) projects an 85% increase in Medicare beneficiaries between 2005 and 2030. Increased life expectancy plays a major role in population growth, and as does the baby boom generation. The leading edge of the baby boom will reach Medicare eligibility in 2011 and the Medicare population will grow from approximately 42 million today to almost 80 million in 2030, when the last of them become eligible. The boomers represent the single most significant demographic shift in U.S. history and their sheer size will pose significant challenges to Medicare. But varying characteristics of this generation will give those challenges an unprecedented twist that will undoubtedly transform the health care landscape.

RICHARD D. DELLA PENNA
AGNES STRANDBERG

See also

Medicaid
Medicare
Medicare Managed Care
Program of All-Inclusive Care for the Elderly (PACE)
Social Security

Internet Resources

CMS: Beneficiary Growth
http://www.cms.hhs.gov/CapMarketUpdates/Downloads/2005CMSStats.pdf

Kaiser Family Foundation
http://www.kff.org/medicare/upload/7473.pdf

MA Enrollment
http://www.medicareadvocacy.org/AlertPDFs/09.22.05.MALockIn.pdf

Medicare Advantage Special Needs Plans: A New Opportunity for Integrated Care?
http://www.nhpf.org/pdfs_fs/FS_11-18-05_MA_SNP.pdf

Medicare Compare
http://www.medicare.gov/comparison/default.asp

Medicare and Medicaid: Key Milestones, 1965–2003
http://www.findarticles.com/p/articles/mi_m0795/is_2_27/ai_n16108607/pg_2

Medicare Plan Finders
http://www.medicare.gov/MPPF/Include/DataSection/Disenrollment/Disenrollment.asp?dest=Nav/CompositeResults/WhyPeopleLeave/CurrentYear

National Committee for Quality Assurance
http://www.ncqa.org/Pages/Main/index.htm

Premiums & Cost-Sharing Features in Medicare's New Prescription Drug Program, 2006
http://www.kff.org/medicare/upload/7517.pdf

"Report to Congress: Issues in a Modernized Medicare Program"
http://www.medpac.gov/publications/congressional_reports/June05_ch3.pdf

REFERENCES

Coleman, E. A., Smith, J. D., Frank, J. C., Min, S-J., Parry, C. & Kramer, A. M. (2004). Preparing patients and caregivers to participate in care delivered across settings: The care transitions intervention. *Journal of American Geriatrics Society*, 52, 1817–1825.

Himmelstein, D. U., Woolander, S., Hellander, I., & Wolf, S. M. (1999). Quality of care in investor-owned vs. not-for-profit HMOs. *Journal of the American Medical Association*, *282*(2), 159–163.

Pacala, J. T., Boult, C., Reed, R. L., & Aliberti, E. (1997). Predictive validity of the Pra instrument among older recipients of managed care. *Journal of the American Geriatrics Society*, *45*(5), 614–617.

Reuben, D. B., Schnelle, J. L., Buchanan, J. L., Kington, R. S., Zellman, G. L., Farley, D. O., et al. (1999). Primary care of long-stay nursing home residents: Approaches of three health maintenance organizations. *Journal of the American Geriatrics Society*, *47*(2), 131–138.

Scott, J., Gade, G., McKenzie, M., & Venohr, I. (1998). Cooperative health care clinics: A group approach to individual care. *Geriatrics*, *53*(5), 68–70, 76–78.

Unutzer, J., Katon, W., Callahan, C. M., Williams, J. W., .Jr, Hunkeler, E., Harpole, L., et al. (2002). IMPACT Investigators: Improving Mood-Promoting Access to Collaborative Treatment. *Journal of the American Medical Association*, *288*(22), 2836–2845.

Wagner, E. (1996). The promise and performance of HMOs in improving outcomes in older adults. *Journal of the American Geriatrics Society*, *44*, 1251–1257.

Ware, J., Bayliss, M., Rogers, W., Kosinski, M., & Tarlov, A. (1996). Differences in 4-year health outcomes for elderly and poor, chronically ill patients treated in HMO and fee-for-service systems: Results from the Medical Outcomes Study. *Journal of the American Medical Association*, *276*(13), 1039–1047.

MEDICARE PART D BENEFIT

Background

Increasing consumer expenditures for drugs provided the political impetus to include a drug-benefit package in the Medicare Modernization Act of 2003 (Public Law. 108-173). After a transition period that offered drug discount cards, the Part D benefit was implemented on January 1, 2006. It was designed to both subsidize medication costs and prevent catastrophic expenses and is a complex piece of legislation whose ultimate impact is still unknown.

At the end of the initial enrollment period, The Centers for Medicare and Medicaid Services (CMS) estimated that all but 4.4 million of 43 million eligible beneficiaries have prescription drug coverage; approximately half are enrolled in a Part D plan, another 24% in employer or union coverage, and the rest through other creditable coverage, such as the Department of Veterans Affairs (Kaiser Family Foundation fact sheet 6/06).

Basic Benefit and Variations

Consumer premiums pay for approximately one-quarter of the program's costs, with the remainder coming from general revenues and contributions from the states. Despite this funding structure, the Part D benefit is administered by private companies, including 1,429 stand-alone prescription drug plans (PDPs) and 1,314 Medicare Advantage–linked drug plans (MA-PDs). Each state has at least 20 different PDPs; most have at least 40 (Kaiser Family

Foundation, 2006). Premiums for the first year, which were expected to average $37/month, in fact averaged $25 per month, a phenomenon CMS attributes to the private-sector competition (Bach & McClellan, 2006).

In the standard plan, beneficiaries pay a monthly premium and a deductible ($250 in 2006), and then the plan pays *on average* 75% of drug costs up to a coverage limit, which was $2,250 in 2006. If the beneficiary exceeds the drug-cost threshold, the program pays nothing toward drug costs until the catastrophic threshold is reached ($3,600 in true out-of-pocket costs, or TrOOP, in 2006). When TrOOP exceeds the threshold, the beneficiary pays 5% of the cost of each prescription or a co-payment. The deductible, coverage limit, and catastrophic threshold are expected to increase yearly.

Not all Part D plans adhere to this structure. Plans are permitted to waive the premium, co-pay, or coverage limits, and some plans, particularly those that have linked to Medicare-Advantage programs, have done so as an incentive to sign up for the health insurance. Nearly two-thirds of PDPs and nearly 80% of MA-PD plans have no deductible; almost all plans charge co-payments for drugs using a tiered formulary system, with low or minimal co-pays for generic drugs, larger co-pays for preferred medications, and very large co-pays for nonpreferred formulary drugs. In addition, there are tax-free subsidies to employers who maintain drug coverage for retirees once Part D begins.

Dual-eligible seniors—that is, those who qualify for Medicare and Medicaid—now have drug coverage paid by Medicare Part D, not by Medicaid. Each dually eligible beneficiary was required to choose or be assigned to a new drug plan at the beginning of 2006, and the transition was at times poorly implemented (Slaughter, 2006). The switch continues to create problems, especially in nursing homes, where pharmacists have had to cope with multiple plans in a single institution.

Low-income seniors do receive some assistance, depending on income and assets. Although beneficiaries have been encouraged to apply for "Extra Help" through the Social Security Administration for the limited income subsidy (http://www.ssa.gov/pubs/10129.html), as many as 3 million eligible beneficiaries had not signed up as of June 2006 (Bach & McClellan, 2006). Existing state pharmaceutical assistance programs (SPAPs) also provide supplemental coverage.

Each plan has its own formulary. By law, "all or substantially all" approved antipsychotic, antidepressant, anticonvulsant, anticancer, immunosuppressant, and HIV/AIDS medications must be included; formularies cannot discriminate against any type of beneficiary and must provide access to all medically necessary treatments. Formularies have a tiering system that groups medications into generic, preferred brand name, nonpreferred brand name, and nonformulary. In this tiering system, generic medications have very low co-pays and preferred brand name drugs have co-pays that are higher but usually moderate. Often plans will charge a high co-pay for nonpreferred brands. Beneficiaries must have access to drugs in each class and drugs can be put in a nonpreferred tier only if there are therapeutically similar medications in the preferred tier. Beneficiaries can appeal a classification (i.e., request that a nonformulary drug be classified as tier 2 or 3) if the drug is therapeutically necessary. Plans can impose quantity limits and preauthorization requirements as disincentives.

Controversies

Enrollment penalty

Although the Part D benefit went into effect January 1, 2006, eligible beneficiaries were allowed to enroll without penalty until May 15, 2006 (or demonstrate that their existing drug plan was at least as good as the Part D benefit, so called "creditable coverage"). Failure to enroll after the initial deadline resulted in a premium penalty of 1% per month. CMS has argued strenuously for the penalty, emphasizing that the Part D program is an insurance program whose viability depends on enrollment of a broad range of beneficiaries, including those taking few, if any, prescription medications. Attracting only the sickest beneficiaries—those with high drug costs—would threaten the viability of the program.

The "doughnut hole"

The coverage gap between the initial cost threshold and the catastrophic threshold is often called the "doughnut hole" and has been a source of considerable discussion. Beneficiaries have been unprepared for marked increases in costs that will occur when they exceed the coverage limit and find they must pay full price for their medications until they reach the catastrophic threshold.

For those beneficiaries who exceed the coverage limit and do not have a plan that eliminates the coverage gap, monthly payments can vary widely; a theoretical beneficiary whose medications cost $1,000 a month might pay nearly $500 the first month, $250 each in months 2 and 3, then $1,000 each in months 4 and 5. By month 7, the bill would be $50 a month until the end of the year, when the cycle would begin again, this time with thresholds set higher. Those with very expensive medications, like some oral chemotherapy, reached the coverage gap in the first month and paid thousands of dollars for medication at the onset of the benefit.

Formulary Limitations

By law, Part D does not cover benzodiazepines; barbiturates; over-the-counter (OTC) medications; and most vitamins, cosmetics drugs for weight loss or weight gain, or cold remedies, among others. In addition, Part D does not cover medications that have been covered under Part B, such as injectable chemotherapy given in a doctor's office. Part B, not Part D, covers medications given by pump. For example, Part B would cover albuterol via nebulizer; Part D would cover albuterol by metered-dose inhaler. Drugs not covered by Part D do not count toward TrOOP, adding further to the beneficiaries' overall payments.

Financial Burdens to the States: Clawbacks and Wraparounds

Because Part D, not Medicaid, now covers medications, state governments are expected to repay $5.8 billion in 2006 to the federal government, reimbursing it for estimated savings. The Supreme Court rejected a challenge to the constitutionality of the "clawback"; lawsuits are still being pursued in the lower courts. In addition, states expect to lose money because of the need for "wraparound" coverage—coverage of medications that had been part of Medicaid but are not part of the Part D benefit, such as benzodiazepines, OTC medications, and nonformulary medications. Drug companies, freed from the rebates states had often negotiated for commonly prescribed medications, are expected to make substantial profits from the change in coverage because they are charging more for medications; the MMA prohibited the federal government from negotiating drug prices, anticipating that private-sector competition would also extract deals from pharmaceutical manufacturers. It is unlikely that significant price concessions will occur with more than 1,000 different Part D plans.

Implications for Professionals

Part D has affected pharmacists in many ways. They must choose which plans to contract with in order to maintain their business without risking inadequate reimbursement; they have borne much of the brunt of the errors during the implementation phase. In addition, pharmacists are expected to educate beneficiaries, including informing them about plans, but they may not steer beneficiaries toward any specific plan, lest they run the risk of violating antikickback statutes. The gray area between educating and steering is especially troubling for dual-eligibles, many of whom were automatically enrolled in plans that may not have been in their best interest (Greene, 2006).

Clinicians are also responsible for ongoing education of their patients and attention to reducing the cost of medications. They can expect to be asked for help with overriding quantity limits and requesting prior authorization for medications. Most formularies are on-line, and often it is possible to work with beneficiaries to find safe, effective, preferred alternatives or choose plans that maximize their cost savings. Clinicians are also responsible for explaining the gaps in coverage. Web sites are available to assist as well. Part D does offer opportunities for cost savings, but it is unnecessarily cumbersome and full of pitfalls. Much of the responsibility for protecting the beneficiary now rests with the providers.

EUGENIA L. SIEGLER

Acknowledgment

The author is on the Medicare Part D pharmacy and therapeutics committee for MEDCO.

See also

Medicaid
Medicare
Medicare Managed Care

Internet Resources

CMS Medicare Page
http://www.cms.hhs.gov/home/medicare.asp

CMS Questions
http://questions.cms.hhs.gov/cgi-bin/cmshhs.cfg/php/enduser/std_alp.php?p_sid=y_gg4P8i

Medicare Rights Center
www.medicarerights.org/newlawframeset.html

Medicare
www.medicare.gov

NewYork State Department of Health Medicaid Update
http://www.health.state.ny.us/health_care/medicaid/program/update/2005/dec2005spec.htm

Social Security Administration
www.ssa.gov

State Health Insurance Assistance Program (SHIP), Health Insurance Information Counseling and Assistance Program (HIICAP): NYS Office for the Aging
http://hiicap.state.ny.us/home/welcome.htm

REFERENCES

Bach, P. B., & McClellan, M. B. (2006). The first months of the Prescription-Drug Benefit—CMS update. *New England Journal of Medicine*, *354*(22), 2312–2314.

Greene, A. (2006). Pharmacists, Medicare Part D, and the antikickback statute. *American Journal of Health-System Pharmacy*, *6*, 1435–1437.

Kaiser Family Foundation (2006, June). The Medicare Prescription Drug Benefit. Available at http://www.kff.org/medicare/upload/7044-04.pdf

Public Law 108–173 (2003). Medicare Prescription Drug, Improvement, and Modernization Act of 2003. Available at http://frwebgate.access.gpo.gov/cgi-bin/useftp.cgi?IPaddress=162.140.64.88&filename=publ173.pdf&directory=/diskb/wais/data/108_cong_public_laws

Slaughter, L. M. (2006). Medicare Part D—The product of a broken process *New England Journal of Medicine*, *354*, 2314–2315.

MEDICATION ADHERENCE

Increasing age is associated with a higher prevalence of chronic diseases that necessitate long-term or lifelong medication intake. Patients older than 65 years are the largest consumers of medications, receiving nearly half of all prescribed medicines. Prevalence of polypharmacy increases with higher age: 11% to 25% of older persons use 5 or more medications simultaneously (De Geest et al., 2004).

Drugs do not work in patients who do not take them (C. Everett Koop, MD, in Osterberg & Blaschke, 2005). Successful management of chronic conditions therefore requires *adherence*. Adherence (also called *compliance*, *concordance*) is defined as "the extent to which a person's medication-taking behavior corresponds with the agreed recommendations of a health care provider" (Sabaté, 2003). Prevalence of nonadherence ranges between 43.7% and100% depending on the methodologies used (Vik, Maxwell & Hogan, 2004). About 50% of patients who start a chronic medication regimen do not *persist* more than 6 months (Osterberg & Blaschke, 2005). This refers to discontinuing or switching treatment over time (Vik et al., 2004). Problems with adherence and persistence may result in increased morbidity, mortality, and health care costs and a decreased quality of life (Osterberg & Blaschke, 2005).

Measurement

Adherence and persistence should be monitored as an important clinical variable in patients on (chronic) medication regimens. Yet, there is no "gold standard" to evaluate adherence and persistence. A combination of different approaches is most valuable (Osterberg & Blaschke, 2005). Direct methods include assay of medication, medication by-products, or tracers (e.g., digoxin) in bodily substances and observation of medication administration. The reliability of assay for adherence assessment depends on the half-life of the substance under scrutiny. Observation allows evaluation of complex medication behaviors (e.g., insulin injection, use of inhalers or eyedrops) (Osterberg & Blaschke, 2005; Vik et al., 2004). Observation also allows assessing whether older patients are still capable of independent medication management despite visual or physical impairments during a clinical encounter or using electronic communication methods such as videophone or "NetMeeting."

Indirect measurement methods are self-report, collateral report, prescription refills, pill count, and electronic monitoring. Self-reports have value when asked in a nonhreatening, nonaccusatory, and information-intensive approach yet underestimate adherence. For instance, clinicians can ask: "I know it must be difficult to take all your medication regularly. How often do you miss taking them?" Electronic monitoring uses a pill bottle that is fitted with a cap containing a microelectronic circuit that registers the date and time of each bottle opening. Recorded data can be downloaded to a computer and medication dynamics can be visualized in listings and graphics. It has superior sensitivity compared to other direct and indirect methods. Tracking prescription refills has value for determining persistence with prescribed treatment in centrally managed pharmacy systems (Osterberg & Blaschke, 2005; Vik et al., 2004).

Risk Factors/Correlates

Risk factors or correlates for nonadherence can be categorized in socioeconomic, patient-related, treatment-related, condition-related, and health-care-team– and health-care-system–related factors (Sabaté, 2003). Socioeconomic factors have been inconsistently related with nonadherence. Older age *per se* is not associated with a higher risk for medication nonadherence, but a number of processes associated with aging may negatively influence patients' ability to manage their medications independently and correctly. These include functional, sensory, and cognitive impairment; social isolation; depression; and marginal functional health literacy (De Geest et al., 2004). The risk for nonadherence is threefold higher in patients who are depressed. Although forgetfulness is a common reason for nonadherence in older patients' dementia is the greatest impediment to independent management of a treatment regimen.

Mistaken illness representations (e.g., hypertension is an acute disease that does not require long-term medication taking) or health beliefs (e.g., medication is poison) as well as medication side effects (e.g., beta-blockers can induce fatigue, impotence, and sleeplessness) can threaten adherence or persistence. Moreover, physiological effects of aging in combination with polypharmacy make older patients more susceptible adverse events. Appointment nonadherence is a proxy of medication nonadherence.

Other factors that can have a negative impact on adherence include treatment-related factors such as duration, complexity, and cost of medication regimens; poor patient–health care provider relationships; and care that does not support patient's self-management (Sabaté, 2003; Vik et al., 2004).

Adherence Interventions

There is no quick fix for adherence or persistence issues. Interventions build on the knowledge of modifiable risk-factors/correlates of nonadherence and the available evidence of experimental research testing the efficacy of adherence-enhancing interventions. Successful interventions have combined several adherence-enhancing strategies over a sustained period (Haynes et al., 2005; Osterberg & Blaschke, 2005).

Improving adherence starts with continuous monitoring of adherence/persistence together with assessment of the elderly patient's ability to independently manage a medication regimen. Functional and sensory abilities, cognition, literacy, knowledge, motivation, illness representations, sources of social support, and financial status should be carefully evaluated during a standard geriatric clinical assessment (De Geest et al., 2004).

Adherence interventions combine educational/counseling, behavioral, and social support/affective strategies. Patients and caregivers require education about the different aspects of the therapeutic regimens. Intensive counseling by a pharmacist or a nurse is effective. Traditional educational tools as well as Internet teaching applications or interactive computer programs with touch screens can be used as valuable and cost-effective teaching interventions. Behavioral strategies include tailoring the regimen to patients' lifestyles, teaching patients self-monitoring strategies (e.g., medication booklet), suggesting the use of medication aids (e.g., pill box, alarm), and cueing (e.g., leaving containers in a particular location). Depression must be treated. Social support from caregivers may involve preparing the patient's medication, reminding the patient to take the medicine, refilling prescriptions, and helping the patient decide to contact a health care worker if a problem arises. Simplification of the regimen is always a goal. Clinicians should also assess the patient's ability to pay for needed medications. A variety of local, state, and federal programs may be available to assist with medication costs. Finally, investing in good patient provider relationships and developing a system of care where the behavioral aspects of medication management are incorporated further contribute to improved adherence (Haynes et al., 2005; Vik et al., 2004).

SABINA DE GEEST

See also

Assistive Technology
Medicaid
Medicare
Over-the-Counter Drugs and Self-Medication
Polypharmacy: Drug–Drug Interactions
Polypharmacy: Management

Internet Resources

Electronic monitoring, Aardex
http://www.aardex.ch

Health and age compliance information
http://www.healthandage.com/default.cfm?framedef=1&curr_navi=02&curr_content=02&curr_page=1&content_action=dsp_haadetail&curr_paramlist=healthandage;1700.;2;haa_submissiondate;2;1;3;&CFID=8236669&CFTOKEN=84078044

Med Manager
http://www.med-manager.com

Medication reminders
http://www.epill.com

World Health Organization: Adherence reports
http://www.who.int/chronic_conditions/adherence/en/

REFERENCES

De Geest, S., Steeman, E., Leventhal, M., Mahrer-Imhof, R., Hengartner-Kopp, B., Conca, A., et al. (2004). Complexity in caring for an ageing heart failure population: Concomitant chronic conditions and age-related impairments. *European Journal of Cardiovascular Nursing*, *3*, 263–270.

Haynes, R. B., Yoa, X., Degani, A., Kripalani, S., Garg, A., & McDonald, H. (2005). Interventions for enhancing medication adherence. *Cochrane Database Systematic Reviews* 2005, Issue 4: CD000011.pub 2. DO1: 10.1002/14651858.CD000011.pub2.

Osterberg, L., & Blaschke, T. (2005). Adherence to medication. *New England Journal of Medicine*, *353*(5), 487–497.

Sabaté, E. (2003). Adherence to long-term therapies: Evidence for action. Geneva: World Health Organization.

Vik, S. A., Maxwell, C. J., & Hogan, D. B. (2004). Measurement, correlates and health outcomes of medication adherence among seniors. *The Annals of Pharmacotherapy*, *38*, 303–312.

MENTAL CAPACITY ASSESSMENT

Assessment of mental capacity should be a routine part of medical care. Health care professionals have traditionally assessed a patient's capacity to make medical treatment decisions, to provide basic care, and to handle finances. Controversial capacity assessments include determining a person's ability to drive a car and ending life-sustaining treatment.

Informed Consent for Medical Treatment

Informed consent regarding health care decisions depends on three elements: information disclosure by the physician, voluntary participation by the patient, and competence of the patient.

Information Disclosure

Information must be in understandable language, which may require translators and multilingual forms. Educational and cultural factors must be considered, as well as emotional and cognitive states. Health care professionals are obliged to present the nature of the medical problem, proposed remedy, and reasonable alternatives; attendant risks and benefits of treatment; and the option of no treatment. Physicians must disclose relevant and significant information for the patient, although they can limit disclosure to therapeutic issues. The ethical goal is to encourage patient autonomy and allow knowledgeable judgment regarding treatment options.

Voluntary Participation by the Patient

People must be allowed to accept or reject treatment without undue influence. Coercion by family, friends, or health care providers compromises an individual's voluntary participation, as can psychiatric symptoms such as delusions, depression, or dementia.

Competency

Competency means to be "duly qualified: answering all requirements; having sufficient capacity, ability, or authority; possessing the requisite physical, mental, natural or legal qualifications" (Black, 2004). Only a court can decide whether a person is competent to perform a particular act.

Competency takes many forms. In the United States, adults are presumed to have *general competence* unless a court determines otherwise. *Specific competence* refers to the skills required for a particular act. Making informed decisions regarding health care is a type-specific competence.

C*onsequence-dependence competency* is similar to "the ends justify the means" thinking, and is commonly seen when a patient's competency is questioned if he or she disagrees with recommended treatment. Conversely, if a patient agrees to a recommended treatment, his or her competence is rarely questioned. In the first case, pressuring someone to change a decision undermines his or her autonomy and the therapeutic relationship. In the second case, patient compliance is confused with choice and ignores the possibility that the patient may not be making a knowledgeable, informed, and rational decision. Discounting a patient's understanding or reasoning is legally and ethically incorrect. When evaluating the ability to make treatment decisions, the process is more important than the outcome.

When a court finds a person is incompetent, a judge appoints a surrogate decision maker—either a guardian or a conservator. In most states, a guardian can legally make decisions directly affecting the incompetent person's life, such as consenting to medical treatment or placement into a nursing-care facility. A conservator's legal responsibility is limited to making decisions about assets and property.

Mental Capacity Assessment

Mental capacity assessment refers to a person's cognitive and emotional status relative to specific observable or legal behaviors. Three approaches to assessing mental capacity are used, singly or in combination:

1. *The Functional Approach* focuses on the appropriateness of a person's actions and statements. If a person behaves oddly, then concerns may exist about the person's level of cognition. *Cognition*

refers to a combination of conscious awareness, ability to maintain attention, memory, and information processing.

Once a concern exists, the next step is to categorize *how* the behavior is inappropriate. Knowledgeable, reasoned, and rational decisions involve 12 mental functions. The model presented here is widely used by health care professionals, social services agencies, law enforcement, and legal professionals. It is useful for assessing a person's capacity to consent to treatment (Etchells et al., 1999) and to handle finances (Clow & Allen, 2002). It consists of assessing the following:

(a) *Ability to express desires:* spoken, written, gesturing

(b) *Response to the environment:* such as recognizing significant changes in surroundings and presence or absence of people. These two functions (i.e., a and b) are the most basic and are impaired only in extreme situations (e.g., delirium, advanced dementia, coma, medication effects).

(c) *Ability to focus attention*: Can the patient prioritize the multitude of stimuli that constantly bombard the senses? To make knowledgeable decisions, the person must be able to assess whether information is pertinent

(d) *Memory*: The patient must remember information long enough to make a decision based on it.

(e) *Options*

(f) *Roles and responsibilities of all pertinent parties*

(g) *Expected consequences of each option.*

(h) *Use of abstract concepts*

(i) *Strategic thinking* (see section on executive functions)

(j) *Presence of delusions:* A delusional person may still have adequate capacity if the delusion does not affect the decision at hand.

(k) *Choice of options*

(l) *Final decision*

Often older adults try to hide cognitive problems by asking questions, using humor, or minimizing contact. One helpful strategy is to ask the person to summarize pertinent information regarding treatment or other issues and to explain the reasons for the final decision.

The functional model is logical, appeals to common sense, and does not require specialized expertise. However, it requires observations by both interested and objective parties (more time and, therefore, greater initial expense) and provides no information regarding causation, treatment, or likely prognosis.

2. *Medical approach* relies on signs and symptoms of disease to determine capacity. The presence of symptoms is equated with cognitive impairment and, therefore, incapacity. Typically, this model evaluates attention, orientation, memory, thought processes, executive and other cognitive functions, hallucinations, delusions, obsessions, and mood and anxiety disorders.

   The medical approach is that it is less time-consuming and less expensive than evaluations that include behavioral observations outside a medical environment. This approach may provide information regarding causation, treatment, or likely prognosis. The drawbacks include the specialized knowledge to perform an evaluation (Moye, Karel, Gurrera, & Azar, 2006) and the need to compare signs and symptoms to the person's observable behaviors for the evaluation to be valid.

3. *Philosophical Approach.* The philosophical approach uses vague and imprecise concepts to define mental capacity. The classic formulation is that a person has adequate capacity if he or she is able to express his or her desires, understands and appreciates the situation, and is rational. Although this approach uses accepted legal language, definitions of terms vary, and there is no consensus regarding evaluation.

Executive Functions

The set of mental abilities needed to plan, organize, and carry out actions—executive functions—is used to shift focus, analyze tasks, form concepts and strategies, and evaluate one's own behavior.

The most important but often unrecognized or overlooked capability is the ability to think strategically. An impaired person cannot readily assess the consequences of his or her decisions. Subtle signs of dysfunction are usually dismissed as trouble concentrating, mild memory loss, eccentricity, or personal rigidity. Although such conditions and personality styles exist, new onset or exacerbation of these behaviors suggests early impairment of executive functions and requires psychiatric investigation.

Executive functions are critical to attention, memory, and learning. Impairment of executive functions is often found in elders who have psychiatric disorders, such as dementia, delirium, severe depression, and mania.

Behavioral problems include (1) impaired organization of material to be learned; (2) poor recall of information; (3) imitation of others' gestures and actions; (4) inappropriate use of objects in the environment; and (5) repeating words, phrases, or actions. Other common co-occurring behaviors include irritability, tactlessness, impulsivity, undue familiarity, absence of social constraint, fatuous and inappropriate euphoria, rapid mood fluctuations, mania, and obsessions and compulsions.Neuropsychological tests of executive functions may clarify the nature and extent of cognitive deficits detected on a mental status examination (Moye et al., 2006). Frequently administered tests of executive functions include the Wisconsin Card Sorting Test, the Stroop Color Word Test, the Rey-Osterrieth Complex Figure Copying Test, and the Trails Making Tests of the Halstead-Reitan Neuropsychological Battery. However, these tests vary considerably in performance and the lack of normative values across the geriatric age span. Additionally, there is only a moderate relationship between test results and behavior in the real world.

Tests of Mental Capacity

There is no single test of mental capacity. The evaluator needs to know what specific capacity is to be assessed because assessing the capacity to make medical treatment decisions differs from assessing the ability to make financial decisions. The evaluator then uses the functional and medical models described earlier. Formal psychological testing, such as tests of gross cognitive functions (e.g., the Mini-Mental Status Examination[MMSE]), memory (e.g., the Rey-Osterrieth Complex Figure Copying Test), or executive functions, may also be used but only as part of an overall assessment.

The MMSE (Folstein, Folstein, & McHugh, 1975) is often inappropriately used to assess mental capacity. The MMSE is a crude screening tool of cognitive abilities and has numerous limitations. It is not a diagnostic test nor can it assess emotional conditions. Scores on the MMSE do not necessarily correlate with real-world function. People with high scores may be unable to function without supervision, and people with low scores may be able to function independently. Older people and those with less formal education tend to score lower, although they may be functionally unimpaired. Ill people tend to score lower, even if the medical symptoms are minimal or absent. Scores on the MMSE are affected by all of the following transitory conditions: alcohol and illicit drug use, medications, sleep deprivation, low blood sugar, low blood pressure, headache, or pain anywhere in the body. The MMSE should be used only as part of an overall evaluation.

MacArthur Competence Assessment Tool for Treatment (MacCAT-T) is a reliable and easy-to-use test of mental capacity to make medical decisions. Based on the philosophical model of mental capacity assessment, the MacCAT-T evaluates the patient's understanding, appreciation, reasoning, and communication related to his or her medical condition by asking a series of questions about the condition and treatment decisions. The test requires minimal preparation time and can be performed at the bedside (Appelbaum & Grisso, 1995).

Editorial Staff

See also

Adult Protective Services
Advance Directives
Autonomy

Cognition Instruments
Guardianship and Conservatorship

Internet Resources

American Bar Association & American Psychological Association
http://www.apa.org/pi/aging/diminished_capacity_part1.pdf

American Psychological Association
http://www.apa.org/pi/aging/

National Committee for the Prevention of Elder Abuse
http://www.preventelderabuse.org/issues/capacity.html

REFERENCES

Applebaum, P., & Grisso, T. (1995). The MacArthur Competence Study I-III. *Law & Human Behavior*, *19*(2), 105–174.

Black, H. C. (2004). *Black's Law Dictionary* (8th ed.). St. Paul, MN: West Publishing.

Clow, H. E., & Allen, E. B. (2002). Psychiatric aspects of mental competency in the aging. *Journal of the American Geriatrics Society*, *50*(11), 1879–1883.

Etchells, E., Darzins, P., Silberfeld, M., Singer, P.A., McKenny, J., Naglie, G., et al. (1999). Assessment of patient competency to consent to treatment. *Journal of General Internal Medicine*, *14*, 27–34.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state." A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, *12*(3), 189–198.

Moye, J., Karel, M. J., Gurrera, R. J., & Azar, A. R. (2006). Neuropsychological predictors of decision-making capacity over 9 months in mild-to-moderate dementia. *Journal of General Internal Medicine*, *21*(1), 78–83.

MENTAL HEALTH SERVICES

The prevalence of most mental illnesses, including substance abuse, is lower among older adults than among younger adults. Rates, however, for depression and cognitive disorders, particularly dementias caused by Alzheimer's disease, are higher for older adults than for younger adults (Miech et al., 2002).

Older adults use many types of mental health services. Traditional services include those provided through community-based agencies and through total and partial hospitalization (Schneider, Kropf, & Kisor, 2000). Many of these programs treat mental illness through medication and counseling techniques such as psychoanalysis, group therapy, and cognitive and behavioral therapies. Elders with more severe, persistent mental illness may use case management, in which a caseworker coordinates services within a network of providers.

Community watch systems have been developed whereby workers who have regular contact with older adults are trained to look for potential problems. For instance, mail carriers are asked to watch for uncollected mail or other signs that a resident may have a problem. If a problem is suspected, the carrier contacts a participating state or community agency, which checks on the resident. This system supports elders who are living alone and may have difficulties that affect their daily functioning. Many communities use telephone-contact programs through which a worker maintains contact with elders known to be at risk for mental health or other problems. Many senior centers offer daycare programs for those with cognitive impairments. These programs offer such services as recreation, personal care, and nutrition management. Finally, many health clinics and senior and drop-in centers screen for mental illness. To prevent problems, these sites often provide educational workshops to inform elders of risk factors associated with mental illness. If mental health problems are identified, older adults must be referred to a mental health professional.

Several residential programs serve elders with mental illness. In addition to services provided at inpatient psychiatric and state hospital settings, older adults living in skilled-nursing facilities can receive mental health treatment as part of their overall care. Alzheimer's disease units or facilities have been developed for patient care as the disease progresses. Thus, patients can be admitted during the early stages of the disease and be moved to specialized units within the same facility as the disease becomes more debilitating.

Professionals and Programs

Physicians, psychiatrists, psychologists, social workers, and psychiatric nurse practitioners are some of the professionals who offer geriatric mental health care. Professionals in these disciplines may choose to obtain specialized training in gerontology. Services provided by these professionals include referral, advocacy, psychotherapy, medication, and service coordination and management. Also, many master's-level programs in gerontology exist. Graduates of these courses provide mostly management services and are generally involved in developing and administering mental health service programs for older adults rather than providing direct mental health services.

Medicare and Medicaid are the two programs that provide coverage for the majority of elders needing mental health services. Medicare, the main health insurance program for people 65 and older, covers a limited number of mental health services. Part A (hospital insurance) of Medicare pays 80% of the costs for inpatient psychiatric care, up to a lifetime limit of 190 days. Part B (medical insurance) of Medicare pays 50% of outpatient mental health services (U.S. Department of Health and Human Services, 2005). However, older adults must pay a monthly premium for Part B coverage. Medicare does not cover all prescription costs, including medications used to treat mental illness. Several supplemental insurance programs (e.g., Medigap) provide varying coverage for mental health services not covered by the basic Medicare program. These supplemental programs also require elders to pay monthly premiums.

Medicaid, the health insurance program for low-income individuals, pays for nursing home care for older adults that meet a financial needs test based on a state-set eligibility standard. Medicaid also pays for a variety of mental health services, including medication costs, but the type of services covered, the amount paid by Medicaid, and eligibility for services vary from state to state (U.S. Department of Health and Human Services, 2005). Medicare and Medicaid programs have moved toward a managed-care model of providing services in many communities. In these instances, the older adult must obtain a referral from his or her primary care physician to receive mental health services. If the patient does not participate in a managed-care program, he or she needs to seek a provider who accepts Medicare or Medicaid payments.

Many older adults rely on private insurance for their health care. Most health insurance companies offer limited mental health services, and some cover the costs of medications. Older adults also can elect to obtain mental health services through a fee-for-service agreement. Finally, many community mental health centers offer services based on a sliding-fee scale for elders who have low incomes, fixed budgets, or both.

Older adults can complete advance directives for mental health care. These directives enable them to specify the type and scope of treatment they would desire if they were unable to articulate their wishes.

Gaps in Availability and Coverage

A major concern about elders with mental illness is their low rate of service use. Many do not seek services from mental health professionals because of the stigma attached to receiving such services. Consequently, many elders visit their primary care physicians complaining of symptoms that may be caused by mental illness. Unfortunately, many health care providers are not trained to recognize symptoms of mental illness in older adults or to differentiate between mental and other health problems. Health care providers holding stereotypical views of aging may assume that symptoms of mental illness are part of normal aging. For this reason, elders with mental illness may be misdiagnosed or not referred to mental health specialists. Further, there is a lack of communication and collaboration between professionals in health care settings and community mental health centers; therefore, many seniors are not receiving comprehensive care. When referred for mental health problems, they find few agencies specializing in treating older adults. Currently, many agencies focus their dollars on programs for children and young adults with chronic mental illness. Moreover, many agencies lack outreach services, and many older adults who are ill, frail, disabled, or homebound or who lack transportation cannot access services. Programs that offer outreach services, such as home health care and delivered meals, do not offer mental health services. Finally, many of the mental health services that are available are cost-prohibitive to elders on fixed incomes.

Although Medicare and Medicaid cover some mental health services, these programs are designed to focus on health and long-term care. If older adults use Medicare Part B for mental health services, the cost can be prohibitive because they must pay 50%; if older adults suffer from severe or persistent mental illness, a limit of 190 days for hospitalization is usually not sufficient for adequate treatment. Purchasing supplemental insurance is not an option for many low-income seniors.

Elders can choose to participate in managed-care plans, which often provide some mental health benefits. However, managed-care programs are designed for physically functional individuals who have acute health problems. Also, the emphasis in managed care is on cost-containment. Thus, managed-care systems tend to restrict access to specialized psychiatric care or to limit the type and scope of treatment individuals can receive. Further, many mental health providers outside the managed-care system cannot survive financially, which limits elders' choice of providers.

Recent legislation addressed mental health service coverage among health insurance companies, but gaps in coverage still exist. The Mental Health Parity Act requires that all group health plans, and insurance coverage offered in connection with group plans, place dollar limits on mental health benefits equal to those placed on medical and surgical benefits. However, this act does not require health plans to provide mental health services. It also does not mandate guidelines on cost-sharing, types of mental health services available, or number of mental health services one can receive.

ANISSA T. ROGERS

See also

Cognitive Changes in Aging
Medicaid
Medicare
Psychotropic Medications in Nursing Homes

Internet Resources

Administration on Aging
http://www.aoa.dhhs.gov/

Alzheimer's Association
http://www.alz.org

Centers for Medicare and Medicaid Services Homepage
http://www.cms.hhs.gov/home/medicaid.asp

National Institute of Mental Health: Health Information
http://www.nimh.nih.gov/healthinformation/index.cfm

REFERENCES

Miech, R. A., Breitner, J. C., Zandi, P. P., Khachaturian, A. S., Anthony, J. C., & Mayer, L. (2002). Incidence of AD may decline in the early 90s for men, later for women: The Cache County study. *Neurology*, *58*(2), 209–218.

Schneider, R. L., Kropf, N. P., & Kisor, A. J. (2000). *Gerontological social work: Knowledge, service settings, and special populations* (2nd ed.). Belmont, CA: Brooks/Cole.

U.S. Department of Health and Human Services (2005). *The Medicare program: General information*. Available at http://www.cms.hhs.gov/MedicareGenInfo/

U.S. Department of Health and Human Services (2005). *The Medicaid program: General information*. Available at http://www.cms.hhs.gov/MedicaidGenInfo/

MILD COGNITIVE IMPAIRMENT: CONTROVERSY IN NOMENCLATURE AND TREATMENT

Mild cognitive impairment (MCI) is an evolving, controversial paradigm that is a fairly sensitive but not specific diagnostic predictor of impending dementia. Clinicians and researchers are eager to identify those at risk for disease so that interventions can be instituted that can delay onset or slow progression—can MCI be a valued tool in this pursuit?

Diagnosis: The Controversy

The current paradigm for MCI is the result of an evolutionary process that had several sources in the early 1990s. Petersen (2004) and others refined and expanded on earlier iterations and provide a definition and measurable criteria that are becoming widely utilized, although still evolving. Specifically, the original Petersen criteria for MCI are (1) not demented, (2) memory complaint, (3) preserved general cognitive functioning, (4) intact activities of daily living (ADL), and (5) impaired memory for age and education. Persons with MCI demonstrate objective-cognitive performance problems defined as 1.5 standard deviations from the age-adjusted mean on neuropsychological testing of memory. There are also subjective complaints substantiated by collateral informants.

Some proportion of persons with MCI represent a group in transition from normal cognitive aging to dementia. The percentage of persons with MCI who will convert to Alzheimer's disease within 5 years ranges from 8% to 40%, depending on the study cited. Although this is an intriguing finding in terms of early opportunities for intervention, it leaves questions regarding the other 60% to 92% of persons with MCI who do not progress and may actually revert to an unimpaired state. Furthermore, the original Peterson criteria identified only one type of MCI; now the construct includes amnestic MCI, nonamnestic MCI, and multiple domain MCI (i.e., with and without memory impairment). Beyond providing categorical accuracy, distinguishing between types of MCI may increase the predictive accuracy when determining who will convert to Alzheimer's disease or other type of dementia. Recent findings include the observation that amnestic MCI more often progresses to Alzheimer's than nonamnestic MCI, which more often progresses to vascular dementia, and that the APOE4 allele is more frequent among persons with amnestic MCI. These data suggest that there are multiple types of MCI and differential conversion rates to Alzheimer's and vascular dementia within the subtypes of MCI.

Research: The Controversy

Decreasing conversion rates in MCI has been the focus of several recent investigations. Salloway et al. (2004) demonstrated a trend during a 6-month period for the donepezil to provide protection against conversion of MCI to dementia. In a more recent study of considerably longer duration, Petersen et al. (2005) randomized 769 participants to a double-blind, placebo-controlled trial of donepezil or vitamin E to delay the conversion of MCI to dementia. During 36 months, 27% of the sample converted to dementia. The mean delay in conversion was 661 days for the donepezil group, 540 days for vitamin E, and 484 for placebo. Although there were no differences between the groups at 36 months, donepezil but not vitamin E was superior to placebo at 18 months. Donepezil was also superior at 36 months for persons carrying the ApoE4 allele that has been associated with an elevated but not definitive risk of Alzheimer's disease. Another approach to studying medication effects in MCI is to monitor the decrease in rate of cognitive decline in MCI. Behl, Black, Streiner, and Lanctot (2005) compared 65 patients with MCI who received cholinesterase inhibitors to 65 patients with MCI who did not during a 12- to 17-month period on performance in various cognitive domains, revealing a protective effect of medication on cognition, specifically in executive functions, verbal fluency, naming, memory, and visuoconstruction.

Pharmacological Intervention: The Controversy

Many organizations have recommended the use of cholinesterase inhibitors and the NMDA partial antagonist memantime to treat the cognitive impairment of Alzheimer's disease, and a number of scientific reviews have advocated their use for both impaired cognition and behavioral disturbances. Yet, doubts about the value of the medications as well as suspicions regarding motives for their use continue for individuals with Alzheimer's disease and, by extension, MCI. Benefits that may be modest in dementia but questionable in MCI should also be considered in the context of risk associated with the medications. In the Salloway et al. study (2004), from 9% to 27% of the treatment group experienced one or more of the gastrointestinal side effects associated with cholinesterase inhibition compared to no more than 7% of the placebo group. Similarly, in the Peterson et al. study (2005), from 6% to16% of the treatment group experienced one or more of the gastrointestinal side effects compared to no more than 6% of the placebo group. A study of galantamine for MCI was halted when 13 deaths among 1,026 treated subjects emerged compared to 1 among 1,022 persons receiving placebo.

The controversy over the use of medication in MCI is best understood in the context of the raging debate over the use of medication in Alzheimer's disease. The most recent wave of controversy was sparked on March 1, 2005, by the National Institute for Clinical Excellence (NICE), an independent advisory agency of the United Kingdom's National Health Service. After performing an independent review of the literature on donepezil, rivastigmine, galantamine, and memantine, NICE judged each compound beneficial for cognition as assessed by objective measures or by global improvement determined by a blinded clinician's subjective impression; however, none were judged worthy of the expenditure. This controversy has extended to studies examining cholinesterase inhibiters in MCI citing the same concerns.

Standard of Success: The Controversy

Ultimately, the value ascribed to the present list of medications approved for treatment of Alzheimer's disease and clinically used for the treatment of MCI rests on the definition of improvement or threshold of benefit—a subjective concept that is defined differently based on the perspective of the person or entity establishing the criteria. One might imagine that a small increase in independent living might be extremely valuable when measured in quality-of-life terms, but much less so in economic terms, should this small improvement in quality of living be accompanied by a significant increase in cost.

Scientific rigor can also assign arbitrary standards for "improvement." For example, the FDA requires statistically significant differences between drug and placebo on both objective and subjective measures of outcome for the medication to receive approval. Donepezil, rivastigmine, galantamine, and memantine have each met the objective and subjective criteria for approval. However, the magnitude of effect when compared to placebo is modest despite being statistically significant. Furthermore, although some medicated patients as well as some placebo recipients will experience marked improvement, a substantial minority will decline as rapidly with drug as without.

Conclusion

Continued honing of MCI nomenclature has the potential to provide an anchor-point for research and early intervention for Alzheimer's disease and vascular dementia. However, in its present form, it serves as a catchall rather than a true early indicator of a dementing disease, with epidemiological studies indicating that a relative paucity of persons with MCI as currently defined will convert to dementia within 5 years of diagnosis. Utilizing several data points in concert, such as meeting the diagnostic criteria for amnestic MCI, having the APOE4 allele, and the presence of neuroimaging markers, may prove to be a more reliable method of predicting dementia than utilizing the MCI construct alone.

The value of cholinesterase inhibitors in the treatment of Alzheimer's disease remains subject to debate; utilizing the medication with a group uncertain to progress to any disease state is that much more controversial. Pharmacotherapy appears to be modestly efficacious in delaying the conversion from MCI to Alzheimer's disease; other treatments are being used clinically and are undergoing scientific investigation to augment that effect. Specifically, there is growing evidence for the utilization of a multimodal approach to treatment, combining pharmacologic interventions with behavioral interventions, such as cognitive stimulation/mental exercise, cognitive training/remediation, and physical exercise. As pharmacologic interventions that arrest or reverse the etiologic processes by which the dementias emerge are eagerly awaited, as are social consensus and enhanced measures of outcome, refinement of the MCI paradigm and utilization of multiple data points for diagnosis and multiple strategies for treatment represent best practice at this time.

TIFFANY HERLANDS
GARY J. KENNEDY

Disclosure

Dr. Kennedy has received unrestricted educational grants, research support, or honoraria from Forest Laboratories, Pfizer Inc., and Janssen Pharmaceutica.

See also

Cognitive Changes in Aging
Dementia: Nonpharmacological Therapy
Dementia: Overview
Vascular and Lewy Body Dementias

Internet Resources

The Alzheimer's Association
www.alz.org

American Academy of Neurology
www.aan.com

American Association for Geriatric Psychiatry
www.aagpgpa.org

American Geriatrics Society
www.americangeriatrics.org

American Psychological Association
www.apa.org

National Institute on Aging
www.nia.gov

REFERENCES

Behl, P., Black, S. E., Streiner, D. L., & Lanctot, K. (2005). Cholinesterase inhibitor treatment slows decline in function and multiple cognitive domains in Alzheimer's disease: A 1-year, prospective study in the Sunnybrook dementia cohort. *Neurology*, *64* (Suppl.1), A145.

Beusterien, K. M., Thomas, S. K., Gause, D., Kimel, M., Arcona, S., & Mirski, D. (2004). Impact of rivastigmine use on the risk of nursing home placement in a U.S. sample. *CNS Drugs*, *18*, 1143–1148.

Lopez, O. L., Becker, J. T., Saxton, J., Sweet, R. A., Klunk, W., & DeKosky, S. T. (2005). Alteration of a clinically meaningful outcome in the natural history of Alzheimer's disease by cholinesterase inhibition. *Journal of the American Geriatrics Society*, *53*, 83–87.

Petersen, R. C. (2004). Mild cognitive impairment as a diagnostic entity. *Journal of Internal Medicine*, *256*, 183–194.

Petersen, R. C., Thomas, R. G., Grundman, M., Bennett, D., Doody, R., Ferris, S., et al. (2005). Vitamin E and donepezil for the treatment of mild cognitive impairment. *New England Journal of Medicine*, *352*, 2379–2388.

Salloway, S., Ferris, S., Kluger, A., Goldman, R., Griesing, T., Kumar, D., et al. (2004). Efficacy of denepezil in mild cognitive impairment: A randomized placebo-controlled trial. *Neurology*, *6*, 651–657.

MINI-MENTAL STATE EXAMINATION

See
Cognition Instruments

MONEY MANAGEMENT

If elders are to continue to live independently in the community, they must have the ability to access cash, understand and keep track of their money, and pay their bills when due. The ability to carry out these routine yet essential tasks of daily money management (DMM), or to find the right person to assist with them, can determine whether a person continues living independently at home or is forced into institutional care.

Case Study. Mrs. Oliver, 87 years old, lived in a New York City middle-income housing cooperative that had become a Naturally Occurring Retirement Community (NORC). When the on-site NORC Supportive Service Program learned from the building's management that Mrs. Oliver had not been paying rent, the program's social worker went to Mrs. Oliver's home. She found an overwhelmed woman, whose finances were in complete disarray. After her husband died and her sight declined, Mrs. Oliver began asking neighbors to write her checks to pay the bills. She did not know what had or had not been paid, nor did she know her bank balance. Mrs. Oliver told the social worker that her husband had always paid the bills. Her children lived far away, and she did not want to admit to them that she could not handle her affairs. She feared that, if they knew, they would want to place her in a nursing home or insist that she move in with them, and Mrs. Oliver did not want to leave her home.

Mrs. Oliver, like 5% to 10% of people older than age 65 and 24% of those older than age 85, can no longer manage the tasks of DMM (Wilber & Buturain, 1993). Factors contributing to a senior's inability to handle day-to-day finances can include visual impairment, physical frailty, and emotional illness. In addition, an unsafe neighborhood or a steep hill to climb can prevent a person from going to the bank for needed cash. Arthritis and other medical conditions may limit the ability to write. Memory problems, ranging from forgetfulness to dementia, often hinder the ability to follow through on tasks. Limited literacy in English as well as lack of familiarity with standard banking, credit, or tax practices (e.g., recent immigrants) may also be in need of DMM assistance (National Center on Elder Abuse, 2003). Elders unable to manage their own money must also be protected from those who wish to exploit them, thus allowing them to continue to live safely in the community.

Many people do not seek assistance until there is a crisis, and family is the first place people turn to for help. Families might only become aware of a problem when failure to pay bills triggers an eviction proceeding or utility companies threaten to shut off service. Often families do not recognize a problem until they notice collection letters or find numerous (or too few) payments to credit card companies. Other signs that there are DMM problems can include notification that unusually large donations to charitable organizations have been made, unexplained large or frequent withdrawals from the bank, constant borrowing from neighbors for needed cash for daily expenses, or the elders regularly "losing or missing" money. Consistent or unusual payments to a person unknown to the family might also be a sign of financial exploitation (Aging Parents and Adult Children Together [A/PACT]). Whereas the majority of seniors who need help with DMM rely on family or friends, for many, like Mrs. Oliver, families are often inaccessible or the senior has outlived the individuals he or she would have entrusted with personal affairs. Although advances in banking, including automatic check deposit, bank's automatic bill paying, and on-line bill paying, have helped families in caring for their elder relative's money management needs, for many these tools are not enough. Although it is usually a family member that must seek assistance for the elder, most people do not know where to start looking. Finding programs or private help varies greatly depending on where a person lives and what they can afford. Services are not standardized or well publicized, and the absence of regulation allows almost anyone to offer DMM assistance and does little to protect the elder from those who would exploit them.

When families are seeking assistance, they are looking for someone to help with any or all of the tasks that comprise DMM:

- sifting through letters and bills and creating an organization/filing system
- helping with medical insurance claims; advocating for proper payment
- assisting with paying bills: including straightening out incorrect, over- and under-payments, writing checks for the senior to sign, arranging for

automatic bill payment by a bank, or performing on-line bill paying
- helping with banking: transferring money between accounts, arranging for direct deposit, and balancing checkbooks
- setting up a method for the senior to get cash for daily living expenses
- determining budgets and tracking expenditures
- filling out forms, entitlement applications, and advocacy
- in some cases, serving as representative payee, power of attorney, or guardian with authority to handle financial transactions, administer benefits, and make decisions for people unable to manage on their own

Good DMM, no matter who provides it, begins with a thorough assessment of the client. It includes the identification and evaluation of existing supports, an analysis of available financial resources and entitlements, current financial responsibilities and expenditures, and evidence of possible financial exploitation (National Center on Elder Abuse, 2003), as well as a full assessment of the person's health and functional abilities. The daily money manager must distinguish between the client's inability to handle money tasks and his or her inability to make decisions about money. If there are questions about the client's cognitive capacity, a psychiatric assessment is necessary to determine whether the client is an appropriate candidate for DMM. Only in those instances in which a client is able to understand and work with the DMM professional or program should DMM be considered. If a person lacks capacity, a referral to adult protective services or petition to the state court to seek a guardian may be necessary.

Many clients needing DMM need additional social services. Money-management problems are often early signs that a person needs other support. DMM assistance should not preclude the need for other professionals. A good DMM provider refers clients to other accountants, lawyers, home health care agencies, and social workers as needed and should be only one part of a long-term-care team.

Although the number of nonprofit agencies, for-profit agencies, and public agencies providing DMM has grown somewhat in the last several years, relatively few agencies nationwide provide these services. Some of the agencies provide DMM exclusively, whereas others offer it as part of a continuum of health and social services. The scope of DMM services offered varies as well.

Professional qualifications of providers of DMM vary as well. AARP's Money Management Program, now more than 25 years old, is the largest program, working with more than 125 agencies in 25 states. It trains volunteers to assist with DMM for low-income elders. Other programs employ social workers and caseworkers or use trained paraprofessionals.

Unfortunately, although recognizing the value of DMM, many community agencies have chosen not to provide it because of its labor-intensive costs, insufficient funding to subsidize DMM programs, fear of liability, or because seniors are reluctant or cannot afford to pay for these services. To assist in the development of DMM programs, the Brookdale Center on Aging's Sadin Institute on Law in New York City has developed the Money Management Assistance Program to encourage and assist care-management agencies to offer DMM services safely and effectively (Brookdale Center on Aging, 1993).

To fill the need for DMM assistance, a new type of practitioner, the Daily Money Manager, has become available in many parts of the United States. The American Association of Daily Money Managers has an active Web site to assist in locating a manager. The site also guides the consumer with questions to ask when interviewing a perspective manager. Some social service and home health agencies, private geriatric care managers, and private daily money managers charge for DMM services, asking $25 to $150 an hour, depending on the client's locale and the complexity of the financial situation.

Whereas all successful relationships are built on trust, it is essential that all parties entering into a formal DMM relationship do so with written contracts that delineate the roles and responsibilities of the daily money manager. Only accurate records about all transactions and strict adherence to written policies and procedures can hope to protect the parties against misunderstandings and potential lawsuits. Although experts in the area of DMM report that lawsuits are rare, a program or practitioner should be either bonded or insured (Brookdale Center on Aging, 1993; National Center on Elder Abuse, 2003).

A money manager should employ the least restrictive interventions available to help the client manage his or her financial affairs. If the senior has a trusted family member or friend, he or she should consider establishing a durable power of attorney to prevent the need for a guardian in the future, if they should lose capacity. The powers can be broad or limited by the client. A power of attorney could also be abused because there is no real legal oversight. For clients who have lost the capacity to handle their finances, additional tools like representative payee or guardianship should be considered. Although guardianship is the most restrictive measure (because it takes away the client's rights), it also provides the most protection with the court's oversight of the elder's affairs.

As seniors age and find it harder to handle their finances and even access their own funds, they risk financial abuse and institutionalization. DMM is becoming an essential component of any successful long-term-care system with the goal of helping seniors live safely in the community.

KAREN BASSUK

See also

Activities of Daily Living
Financial Abuse
Guardianship and Conservatorship
Naturally Occurring Retirement Communities (NORCs)
Substitute Decision Making

Internet Resources

AARP Daily Money Management Program
http://www.aarpmmp.org

Aging Parents and Adult Children Together (A/PACT)
http://www.ftc.gov.bcp/conline/pubs/services/apact/apact02.html

American Association of Daily Money Managers
http://www.aadmm.com

Federal Deposit Insurance Corporation, Financial Caregiving: A Survival Guide.
http://www.fdic.gov/consumers/consumer/news/cnsum9y/fincare.html

REFERENCES

Brookdale Center on Aging, Sadin Institute on Law (1993). The Money Management Assistance Program. Available at http://www.brookdale.org/dmm/

National Center on Elder Abuse (2003, June). *Daily Money Management programs: A protection against elder abuse*. Washington, DC. Available at http://www.elderabusecenter.org/pdf/publication/DailyMoneyManagement.pdf

Wilber, K. H., & Buturain, L. M. (1993). Developing a daily money management service model: Navigating the uncharted waters of liability and viability. *Gerontologist*, *33*(5), 687–691.

MORBIDITY COMPRESSION

The health of seniors is an increasingly important health and socioeconomic issue as populations age in developed nations. In the absence of a theoretical paradigm for health education and prevention, the health-promotion community has been criticized for mistaking association for causality or for promoting a world of disabled and demented individuals.

The compression-of-morbidity paradigm envisions a reduction in overall morbidity (and health care costs) by narrowing the period of morbidity between the onset of disability and death (Fries, 1980). The healthy life is seen as a life that is vigorous and vital until shortly before its natural end. Intuitively, the concept of delaying the onset of disability through the prevention of disease and the reduction of health risks seems natural. However, in the early and middle years of the 20th century, movement was away from this ideal, with a steady increase in the portion of life spent ill or infirm. Acute illnesses had given way to chronic diseases with longer periods of disability and morbidity. This phenomenon has been termed *the failure of success*.

It had been suggested that as people better cared for themselves and lived longer, they would live into those later years in which disability is greatest and would experience an increase in overall lifetime disability. Critics feared that good behavioral health habits would lead to an epidemic of Alzheimer's disease and a huge population of enfeebled, demented elders who would pose an immense strain on medical resources. Thus, the direct test of compression (or extension) of morbidity depends on the effects, studied prospectively and longitudinally, of reduced health risks on cumulative lifetime disability and on mortality. Will age-specific disability decline more rapidly than age-specific mortality, or vice versa?

New and emerging data document that early fears were unfounded. First, life expectancy from advanced ages has plateaued rather than increasing markedly, as predicted. In the United States, the life expectancy of women from age 65 increased only 0.6 year from 1980 to 1997. From age 85, female life expectancy in the United States has remained constant at about 6.4 years.

Second, recent longitudinal data document the ability to delay significantly the onset of disability with age. In 1985, researchers at the Stanford University School of Medicine began studying the effects of long-distance running and other vigorous exercise on patient outcomes in 537 members of a runners club, compared with 423 age-matched community controls; participants in both groups are at least 50 years old. The study was designed as a test of the compression-of-morbidity hypothesis. Appropriate controls for self-selection bias included longitudinal study; X-rays of hands, knees, and hips; intention-to-treat analyses; and statistical adjustment for other variables. Disability levels are assessed yearly, allowing the area under the disability curve to be assessed and approximating cumulative lifetime disability. When a person is disabled, it means that he or she has difficulty performing one or more activities of daily living (ADL). Runners, exercising vigorously for an average of 280 minutes per week, delayed the onset of disability by about 10 years compared with controls. Among both male and female runners, disability increased at a rate only one-third that of the controls, after adjusting for age, initial disability, educational level, smoking behavior, body mass index (BMI), history of arthritis, and the presence of co-morbid disease. As these subjects moved from age 58 toward age 70, the differences in physical function between the exercising and the control populations actually increased rather than decreased. The lifetime disability rate in exercisers is only one-third to one-half that in sedentary individuals (Fries, 2003).

In a University of Pennsylvania alumni study, 1,741 university attendees were surveyed in 1939 and 1940; again in 1962, at an average age of 43; and then annually since 1986. This unique data set contains more than 50 years of longitudinal data, including demographics, health care utilization, health risks, disability, and mortality. Health-risk strata were developed for persons at high, moderate, and low risk, based on the three risk factors of smoking, BMI, and lack of exercise. Cumulative disability from 1986 (at an average age of 67) to 1994 (at an average age of 75) or until death served as a surrogate for lifetime disability. Persons with high health risks in 1962 or in 1986 had approximately twice the cumulative disability than those with low health risks. Results were consistent across survivors, deceased subjects, males, females, and those without disability in 1986 and during the last 1 and 2 years of observation. Deceased low-risk subjects had only one-half the disability of high-risk subjects in their last 1 and 2 years of life. High-risk subjects, despite having increased mortality, had greatly increased lifetime disability. Onset of disability was postponed by approximately 7.75 years in the low-risk stratum as compared with the high-risk stratum. The 100% reduction in disability rates was balanced against only a 50% reduction in mortality rates, documenting compression of morbidity (Vita, Terry, Hubert, & Fries, 1998).

Many recent major studies by other groups confirm these findings definitively. Daviglus and colleagues, in a series of studies (Yan, et al., 2006) have shown substantial decreases in hospital costs for those with few risk factors in midlife. Freedman, Martin, & Schoeni (2002), in a meta-analysis of 16 longitudinal surveys of disability, reported disability declines of more than 2% per year; mortality decreases have been only 1% per year documenting compression of morbidity at the population level.

Breslow (2006), among others, has shown strong national trends at the population level, in the United States and a number of other developed nations, toward better senior health status over time.

Compression of morbidity is readily demonstrable in those who exercise vigorously compared with those who do not, in those with low behavioral health risks versus those with high risks, and in those with high educational attainment compared with low. Health-risk behaviors as determined in midlife and late adulthood strongly predict subsequent lifetime disability. Both cumulative morbidity and morbidity at the end of life are decreased in those with good health habits. Morbidity is postponed and compressed into fewer years in those with fewer health risks.

Further, randomized controlled trials demonstrate that health-improvement and risk-reduction programs can reduce risks, improve health status, and reduce the need and demand for medical services in senior populations. The Bank of America study of 4,700 retirees randomized into a health-improvement program or a control group reduced costs by 20% and improved health indices by 10% to 20% (Fries, Koop, Sokolov, Beadle, & Wright, 1998). The California Public Employees Retirement System study of 57,000 seniors yielded similar results (Fries et al., 1998). Chronic-disease self-management programs in arthritis and in Parkinson's disease documented the effectiveness of health-improvement interventions in persons with chronic illness. Self-management programs in healthy seniors have improved health and reduced costs (Fries et al.,1998).

Three components support a national health policy to improve senior health. First is the conceptual base, represented by the compression-of-morbidity paradigm, now proven. Second is the epidemiological data associating behaviors with health outcomes, comparing effects on morbidity with those on mortality, and providing proof of concept. Third are the randomized controlled trials, now available, that prove that effective behavioral interventions can decrease senior morbidity and medical care costs (Fries, 2003).

The paradigm of a long, healthy life with a relatively rapid terminal decline represents an attainable ideal. Health policies must be directed at modifying those health risks that precede and cause morbidity if this ideal is to be approached for a population.

James F. Fries

See also

Active Life Expectancy
Life Extension

Internet Resources

ARAMIS (the Arthritis, Rheumatism, and Aging Medical Information System)
http://aramis.stanford.edu

Health Project
http://healthproject.stanford.edu

National Institute on Aging
http://www.nia.nih.gov

REFERENCES

Breslow, L. (2006). Health Measurement in the Third Era of Health. *American Journal of Public Health*, *96*(1), 17–19.

Freedman, V. A., Martin, L. G., & Schoeni, R. F. (2002). Recent trends in disability and functioning older adults in the United States: A systematic review. *Journal of the American Medical Association*, *288*, 3137–3146.

Fries, J. F. (1980). Aging, natural death, and the compression of morbidity. *New England Journal of Medicine*, 303, 130–135.

Fries, J. F. (2003). Measuring and monitoring success in compressing morbidity. *Annals of Internal Medicine*, *139*(5), 455–459.

Fries, J. F., Koop, C. E., Sokolov, J., Beadle, C. E., & Wright, D. (1998). Beyond health promotion: Reducing need and demand for medical care. *Health Affairs*, *17*(2), 70–84.

Vita, A. J., Terry, R. B., Hubert, H. B., & Fries, J. F. (1998). Aging, health risks, and cumulative disability. *New England Journal of Medicine*, *338*(15), 1035–1041.

Yan, L. L., Daviglus, M. L., Liu, K., Stamler, J., Wang, R., Pirzada, A., et al. (2006). Midlife body mass index and hospitalization and mortality in older age. *Journal of the American Medical Association*, *295*(2), 190–198.

MULTIDIMENSIONAL FUNCTIONAL ASSESSMENT: INSTRUMENTS

Multidimensional function assessment was developed to facilitate comprehensive assessment and effective *resource allocation* among older people. A variety of methods and tools are available for those purposes: Older Americans Resources and Services (OARS), Multilevel Assessment Inventory (MAI), and Minimum Data Set (MDS).

OARS

The assessment form for OARS is called the OARS Multidimensional Functional Assessment Questionnaire, or OMFAQ. The OMFAQ has been updated to reflect changes in the aging population and has been used in hundreds of research studies and geriatric clinical settings across the country. Normative data sets on community elderly are based on data from Durham, North Carolina (minimum age 65, N = 998), Virginia (minimum age 65, N = 1,530), and Cleveland, Ohio (minimum age 65, N = 1,609). The Cleveland study includes longitudinal data.

The OMFAQ is best understood in the context of the OARS model, which consists of three elements: (1) population classification according to functional status, (2) classification of service utilization, and (3) development of a transition matrix of services and functional states.

The OMFAQ has two parts. Part A assesses overall personal functioning in five dimensions: social, economic, mental health, physical health, and self-care capacity. The social resource dimension consists of 14 items, including marital status, living arrangement, social supports, and interaction. The economic resource dimension has 16 items about employment, income, and insurance status. The mental health dimension has six items, including life satisfaction and depression. The physical health dimension has 19 items, including inpatient days, nursing home days, and medication in the last 6 months; current illness; other physical problems; and supportive devices. The self-care capacity dimension has 15 items consisting of both instrumental activities of daily living (IADL) and physical activities of daily living (PADL) sections.

The theoretical basis and practical relevance of the IADL section of the OMFAQ were based on the earlier works of Lawton and Brody (1969). IADL consist of seven items: telephone use, travel, shopping, meal preparation, housework, taking own medicine, and handling personal finances. Unlike the original Lawton and Brody scale, all items are asked of both men and women. The assessment of performance level is the same for all items: each is evaluated according to whether the activity in question can be performed unaided, whether some help is needed, or whether the activity cannot be performed at all. The PADL section of the OMFAQ consists of seven items: eating, dressing, grooming, walking, getting in and out of bed, bathing, and toileting. Part A includes a final summary rating that has been developed for each dimension. Possible scores range from excellent functioning (1) to totally impaired (6). These summary ratings provide a profile of individual functioning, highlighting particular areas of functioning that require further attention.

Part B of the OMFAQ assesses the extent of utilization in each of 24 generically defined service areas, including transportation, social and recreational services, employment services, educational services, mental health services, nursing care, physical therapy, continuous supervision, relocation and placement services, homemaker services, and systematic multidimensional evaluation. Service providers can be both formal and informal. For each service area, the elderly person is asked about actual use in the past 6 months and self-perception of the need for such services.

A trained interviewer, who has at least a high school education, typically fills in the OMFAQ, but the items can also be self-administered. By administering parts A and B to the same subjects at periodic intervals, the data can be used to develop a transition matrix that can assess the impact of generically defined service packages on a target population (Fillenbaum & Smyer, 1981).

MAI

The MAI was developed at the Polisher Research Institute, Madlyn and Leonard Abramson Center for Jewish Life (formerly the Philadelphia Geriatric Center) in 1982. It is based on a conceptual model of Lawton and colleagues (1982), who described human competence as a variety of tasks. The lowest task level, life maintenance, is followed by more complex levels of functional health, perception-cognition, physical self-maintenance, instrumental self-maintenance, effectance (i.e.,activity emanating from motivation to explore), and social behavior. The MAI systematically assesses human well-being in the domains of physical health (i.e., self-rated health, health behavior, health conditions), cognition (i.e., mental status, cognitive symptoms), ADL (i.e., PADL, IADL), time use, social interaction (i.e., friends, family), personal adjustment (i.e., morale, psychiatric symptoms), and perceived environment (i.e., housing quality, neighborhood quality, personal security). In recognition of different needs for depth of information and of differing capacities of subjects to tolerate interview, three forms of the MAI have been developed: full-, mid-, and short-length forms.

MDS

The MDS differs from other multidimensional functional assessment instruments, in that its purpose is to provide a basis for planning and delivering care to nursing-home residents. The MDS was developed by the Centers for Medicare and Medicaid (formerly the Health Care Financing Administration) contract, and its use is mandated in all nursing homes certified to participate in Medicare and Medicaid programs. The information collected primarily by nursing staff includes cognitive pattern, communication problems, vision problems, mood and behavior, psychosocial well-being, physical functioning, continence, disease, health conditions, oral and nutritional status, skin condition, activity pursuit patterns, medications, special treatments, and discharge potential (Morris et al., 1997).

The MDS's value in clinical and research settings has been internationally recognized, and it has been translated and validated in more than 15 countries. A home-care version of the MDS, the MDS-HC, developed by inter*RAI* (which is a collaborative network of researchers in more than 20 countries committed to improving health care for persons who are elderly, frail, or disabled), includes two-thirds of the nursing-home MDS items and has additional items in social functioning, informal support, IADL, and environment. Inter*RAI* has developed other multidimensional functional assessment instruments for various care settings, including acute care, palliative care, and community mental health. Each instrument has been translated into languages other than English. In addition, a variety of enhancements including eligibility algorithms, quality indicators, case mix classification systems, data integrity tools, or best practice protocols is available for some instruments.

YUKARI YAMADA

See also

Activities of Daily Living
Geriatric Evaluation and Management Units
Geriatric Interdisciplinary Team Training
Measuring Physical Function
Multidimensional Functional Assessment: Overview
Occupational Therapy Assessment and Evaluation

Internet Resources

MAI: Polisher Research Institute
http://www.pgc.org/

MDS: inter*RAI*
http://www.interrai.org/section/view/

OARS: Duke University Center for the Study of Aging & Human Development
http://www.geri.duke.edu/service/oars.htm

REFERENCES

Fillenbaum, G. G., & Smyer, M. A. (1981). The development, validity, and reliability of the OARS multidimensional functional assessment questionnaire. *Journal of Gerontology*, *36*(4), 428–434.

Lawton, M. P., & Brody, E. M. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist 9*, 179–186.

Lawton, M. P., Moss, M., Fulcomer, M., & Kleban, M. H. (1982). A research and service oriented multilevel assessment instrument. *Journal of Gerontology*, *37*(1), 91–99.

Morris, J. N., Nonemaker, S., Murphy, K., Hawes, C., Fries, B. E., Mor, V., et al. (1997). A commitment to change: Revision of HCFA's RAI. *Journal of the American Geriatrics Society*, *45*(8), 1011–1016.

MULTIDIMENSIONAL FUNCTIONAL ASSESSMENT: OVERVIEW

Comprehensive multidimensional functional assessment generates information on population and individual status and needs and provides a rational basis for allocating services and assessing service impact. Emphasis is on functional status rather than on diagnosis because level of personal independence, not morbidity, is the relevant issue. A comprehensive approach underlies geriatric evaluation, with its intent to uncover hitherto unrecognized but addressable problems (Rubenstein & Rubenstein, 1998).

Comprehensive, detailed evaluations have been developed for both population surveys and individual assessment of older persons. Brief measures for use in outpatient settings and as intake screens by service agencies are also available.

The major English-language multidimensional assessments share seven dimensions: (1) activities of daily living (ADL), (2) physical health, (3) mental health, (4) social resources, (5) economic resources, (6) environmental matters, and (7) level of strain on the caregiver. The first three dimensions relate to personal functioning; the other four dimensions reflect both broader societal concerns and external conditions influencing continued community residence. Some might add religiosity/spirituality, but this area remains underdeveloped.

Each of these core dimensions is itself multidimensional, and content may vary with the population to which it will be administered. For example, items assessing basic ADL, instrumental ADL (IADL), and mobility may vary depending on whether focus is on community-dwelling elderly or institutionalized persons. Physical health assessments are typically based on a combination of topics selected from self-assessments of health, presence of physical symptoms, diagnosed illnesses and conditions and the extent to which they interfere with usual activities, prescribed medications, and level of activity. Similarly, mental health assessments may include brief screens of cognitive functioning, depression and psychiatric disorder, and personal assessment of emotional well-being. Assessment of social resources generally focuses on the extent and adequacy of contact with family and friends, the anticipated availability and duration of help from these sources, and participation in social activities. Economic-resource assessment focuses on income adequacy and source and whether all eligible sources are being tapped.

Because environmental matters (e.g., physical accessibility, social milieu) can affect the feasibility of independent living, some multidimensional assessments inquire about the structural properties of the dwelling, access to services, and local ambiance.

Help from the family may determine the feasibility of home living, but such help often places considerable stress on the caregiver. As a result, assessment of caregiver strain and service needs has become a concern. Such measures, however, are not yet routinely included in multidimensional assessments.

Validity and reliability have been determined for only a few multidimensional assessment

TABLE M.1 Overview of Content, Samples, and Administration of Selected U.S. Multidimensional Functional Assessment Questionnaires

	CARE[a]	MAI	OARS	Pathfinder Profile
Activities of daily living				
Instrumental	++	++	++	++
Basic	++	++	++	++
Physical health				
Self-assessment	+	+	+	+
Symptoms	++	0	0	0
Diagnosis, medications	+	+	++	+
Medical services	+	+	+	+
Level of activity	+	++	++	0
Social impairment (bed days)	++	++	++	0
Mental health				
Cognitive functioning	++	++	++	+
Symptoms/diagnosis	++	+	+	0
Self-assessment	+	+	+	+
Excellence of functioning	+	0	+	0
Social resources				
Contacts with family, friends	++	++	++	+
Availability of help	++	+	++	0
Economic				
Income, source	+	+	++	+
Environmental				
Environmental matters	++	++	0	+
Caregiver				
Level of strain	++	0	0	0
Other areas examined				
Nutrition	++	+	+	0
Time use	0	++	0	0
Services	+	+	++	0
Summary scores	++	++	++	+

CARE: Comprehensive Assessment and Referral Evaluation
MAI: Multilevel Assessment Inventory
OARS: Older Americans Resources and Services Multidimensional Functional Assessment Questionnaire
0 = absent or essentially so, or not applicable
\+ = present, minimal; or type
++ = present, adequate
[a] Information applies to the original CARE instrument. For recent modified versions, consult references.

measures. Primary among these are the Comprehensive Assessment and Referral Evaluation (CARE), Iowa Self-Assessment Inventory (ISAI) (Morris et al., 1990), Multilevel Assessment Inventory (MAI) (Lawton, Moss, Fulcomer, & Kleban, 1982), Older Americans Resources and Service (OARS) (Fillenbaum, 1988), and a modification of it, the Functional Assessment Inventory (FAI) (Cairl, Pfeiffer, Keller, Burke, & Samis, 1983). Although typically administered by trained nonprofessionals, some measures can also be self-administered.

CARE was designed to be a clinical instrument to examine medical, psychiatric, and social problems of elderly persons in the community. Considerably refined since its introduction, CARE now affords users the unique opportunity of selecting from a variety of brief, statistically derived scales to tailor a purpose-specific questionnaire (Gurland

& Wilder, 1984). The MAI is based on Lawton's conceptual model of the well-being of older people. Medium- and short-length versions are available. The OARS questionnaire operationalizes a program-evaluation and resource-allocation model. Placing equal emphasis on determining service use and assessing all levels of functional status, it facilitates assessment of service impact. The comparability of CARE, ISAI, MAI, and OARS in assessing functional status remains to be determined. They represent, however, a set of valid and reliable instruments of proven value.

Briefer and typically less comprehensive multidimensional assessments include the 17-item Duke Health Profile (administration time less than 5 minutes) (Parkerson, 2002) and the Functional Status Questionnaire (FSQ) (administration time 15 minutes) (Jette et al., 1986). Each assesses physical and mental health, ADL, and social functioning. In addition, the FSQ is concerned with work performance and sexual relationships. Both measures are specifically designed for primary care use, an important consideration because current legislation decrees that within 6 months of enrollment, new Medicare beneficiaries are entitled to a "Welcome to Medicare" multidimensional examination that reviews physical health, basic ADL, diet, physical and social activities, adverse health behaviors, and depression. Unlike the United Kingdom, which in 2004 implemented a Single Assessment Process, no specific measures have been recommended.

Multidimensional measures have also been developed for special groups. The Functional Independence Measure (FIM) (Linacre et al., 1994), for use by trained professionals, has particular value in rehabilitation. Reforms introduced under the Omnibus Budget Reconciliation Act (OBRA-87) require nursing homes to implement the Minimum Data Set for Nursing Home Resident Assessment and Care Screening (MDS) on a regular basis and to develop care plans (Hawes et al., 1997). Versions of the MDS Resident Assessment Instrument (RAI) have been developed for home health care (MDS-HC, OASIS), and post-acute care (MDS-PAC). These instruments are lengthy and require specialized training. The RAI uses computerized data entry, which facilitates database development and analyses.

Whereas most multidimensional measures focus on the individual, the Pathfinder Profile (Maddox & Bratesman, 1997), links agency requirements for comprehensive information with a rapid multidimensional review of client status. In particular, it identifies the urgency with which intervention is needed. Like the FSQ, which is designed to print out a patient profile, the Pathfinder Profile provides printouts that describe patient status and fulfill mandated agency reporting requirements.

The value of multidimensional assessment at a population, individual, and agency level is well accepted, for it facilitates appropriate planning and service provision, which should result in improved outcomes based on rational expenditures.

GERDA G. FILLENBAUM

See also

Multidimensional Functional Assessment: Instruments

Internet Resources

Comprehensive Assessment and Referral Evaluation (CARE)
http://www.proqolid.org/public/CARE.html

Functional Independence Measure
http://www.udsmr.org/

Minimum Data Set (follow links for Resident Assessment Inventory, OASIS, etc.).
http://www.cms.hhs.gov/MinimumDataSets20/

Multilevel Assessment Instrument (MAI)
http://www.abramsoncenter.org/PRI/scales.htm

OARS Multidimensional Functional Assessment Questionnaire
http://www.geri.duke.edu/service/oars.htm

United Kingdom (2004) Single Assessment Process
http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/SocialCare/SingleAssessmentProcess/fs/en

World Health Organization
http://www.who.int/classification/icf

http://www.who.int/classification/icf/checklist/icf-checklist.pdf

REFERENCES

Cairl, R. E., Pfeiffer, E., Keller, D. M., Burke, H., & Samis, H. V. (1983). An evaluation of the reliability and validity of the Functional Assessment Inventory. *Journal of the American Geriatrics Society*, *31*, 607–612.

Fillenbaum, G. G. (1988). *Multidimensional functional assessment of older adults: The Duke older Americans resources and services procedures*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Gurland, B. J., & Wilder, D. E. (1984). The CARE interview revisited: Development of an efficient systematic clinical assessment. *Journal of Gerontology*, *39*, 129–137.

Hawes, C., Mor, V., Phillips, C.D., Fries, B. E., Morris, J. N., Steele-Friedlob, E., et al. (1997). The OBRA-87 nursing home regulations and implementation of the Resident Assessment Instrument: Effects on process quality. *Journal of the American Geriatrics Society*, *45*, 977–985.

Jette, A. M., Davies, A. R., Cleary, P. D., Calkins, D. R., Rubenstein, L. V., Fink, A., et al. (1986). The Functional Status Questionnaire: Reliability and validity when used in primary care. *Journal of General Internal Medicine*, *1*, 143–149.

Lawton, M. P., Moss, M., Fulcomer, M., & Kleban, M. H. (1982). A research and service-oriented multilevel assessment instrument. *Journal of Gerontology*, *37*, 91–99.

Linacre, J. M., Heinemann, A. W., Wright, B. D., Granger, C. V., & Hamilton, B. B. (1994). The structure and stability of the Functional Independence Measure. *Archives of Physical Medicine and Rehabilitation*, *75*, 127–132.

Maddox, G. L., & Bratesman, S., Jr. (1997). Preassessment screening: An essential building block in LTC information systems. Occasional LTC Policy Paper Series, no. 6. Durham, NC: Duke Long Term Care Resources Program, Duke University Medical Center.

Morris, W. W., Buckwalter, K. C., Cleary, T. A., Gilmer, J. S., Hatz, D. L., & Studer, M. (1990). Refinement of the Iowa Self-Assessment Inventory. *Gerontologist*, *30*, 243–247.

Parkerson, G. R., Jr. (2002). User's guide for Duke health measures: Duke health profile (DUKE), Duke severity of illness checklist (DUSOI), Duke case-mix system (DUMIX), Duke social support and stress scale (DUSOCS). Durham, NC: Duke University, Department of Community and Family Medicine.

Rubenstein, L.Z., & Rubenstein, L.V. (1998). Multidimensional geriatric assessment. *Geriatrics*, *53*, 76–78.

MUSCLE CRAMPS

Painful and prolonged involuntary muscle contractions, or cramps, are common among older individuals. More than 70% of elderly people (Man-Son-Hing & Wells, 1995) and between 35% and 95% of all adults have experienced muscle cramps at least once in their lives (Leclerc & Landry, 1996). This prevalence might be underestimated because muscle cramps are most likely reported to the physician only if they are experienced frequently.

Modern neurophysiological research strongly suggests that muscle cramps are caused by excitation of spinal motoneurons, mediated by changes in presynaptic input (Jansen, Lecluse, & Verbeek, 1999). Careful attention to signs and symptoms should differentiate between true muscle cramps and contracture, tetany, and dystonia (McGee, 1990).

True muscle cramps are related to electrical motoneuron hyperactivity that produces sustained muscle spasms. They often are preceded by repetitive contractions of isolated motor units, clinically visible by muscle twitches or fasciculations. True muscle cramps (see Table M.2) include ordinary or idiopathic cramps of benign origin, as well as muscle cramps associated with specific conditions.

A *contracture* is an electrically silent, involuntary muscle contraction related to missing muscle relaxation. Unlike ordinary cramps, contractures do not occur at rest but occur during exercise and in association with metabolic myopathies or thyroid disorders.

Tetany is a clinical syndrome of generalized nerve hyperexcitability producing muscle spasms, sensory hyperactivity, and paresthesias. It is usually caused by hypocalcemia, respiratory alkalosis, hypokalemia, or hypomagnesemia.

TABLE M.2 Etiologies of True Muscle Cramps

1. Ordinary (idiopathic) cramps
2. Muscle cramps associated with specific conditions
   - Altered fluid and electrolyte levels
     - Hypoglycemia
     - Severe hyponatremia with salt depletion
     - Hemodialysis
   - Drug-induced cramps
     - Diuretics
     - Nifedipine
     - Beta-agonists
     - Steroids
     - Morphine
     - Cimetidine
     - Penicillamin
     - Statins
     - Lithium
     - Alcohol
   - Lower motoneuron disease
     - Amyotrophyic lateral sclerosis
     - Polyneuropathies
     - Recovered poliomyelitis
     - Peripheral nerve injury
     - Nerve-root compression

Dystonia is characterized by sustained contraction of agonist and antagonist muscles. It may manifest as occupational cramps in patients who have spent years mastering fine hand motor control for a specific task (e.g., pianist, typist), or it may be induced by antipsychotic medications.

Ordinary (Idiopathic) Cramps

Ordinary cramps, the most common form of muscle cramps, are localized, involuntary, visible, and usually painful contractions of skeletal muscle. They occur preferentially and sporadically at night in the lower extremities (i.e., calf muscles) and usually last a few seconds to a few minutes. Ordinary cramps can be familial (Jacobsen, Rosenberg, Huttenlocher, & Spire, 1986) and are more frequent in individuals with well-developed muscles or cirrhosis (Abrams, Concato, & Fallon, 1996). The cramp begins with a voluntary contraction starting at a muscle's shortest position. This may explain the susceptibility to night cramps when, because of ankle plantar flexion (i.e., under heavy bedcovers), the calf muscles are most shortened and therefore in their most vulnerable position.

The most effective treatment for an acute muscle cramp is stretching the affected muscle (Leclerc & Landry, 1996). Calf-muscle cramps are relieved by placing the foot firmly in dorsiflexion, either by hand or by standing. The calves can be stretched by leaning forward against a wall from a distance of 2 feet, keeping the feet flat and heels on the floor. Simple mechanical prevention of benign nocturnal leg cramps includes stretching the calf muscles several times a day, using light bedclothes or a footboard during sleep, or lying prone with the feet dangling over the edge of the bed. Pharmacological prophylaxis of ordinary muscle cramps should be considered only if these simple mechanical measures fail and the patient's quality of life is affected significantly.

Quinine sulfate, commonly used at higher doses for malaria treatment, is effective but controversial for cramp prophylaxis. In a meta-analysis including 107 patients from six trials, quinine reduced the number of nocturnal leg cramps in elderly people by 27%, compared with placebo (Man-Son-Hing & Wells, 1995). The U.S. Food and Drug Administration bans quinine-based over-the-counter preparations for nocturnal leg cramps due to its potentially severe side effects. The typical dose for cramp prevention is 200 to 300 mg, taken regularly at bedtime as opposed to on an as-needed basis; 4 weeks of treatment may be necessary to show a beneficial effect (Man-Son-Hing & Wells, 1995). Drug interactions and serious side effects such as quinine-induced thrombocytopenia, potentially fatal hypersensitivity reactions, visual toxicity, cinchonism (i.e., nausea, vomiting, tinnitus, and deafness), and ventricular arrhythmia require close patient monitoring and careful consideration of risks versus benefits. Patients need to be educated realistically and advised of the potential efficacy and side effects of quinine (Leclerc & Landry, 1996). Other proposed pharmacological treatments include calcium blockers, vitamin E, carbamazepine, diphenhydramine, phenytoin, methocarbamol, and riboflavin. To date, no randomized controlled trials proving the efficacy of such pharmacological treatments have been reported.

Muscle Cramps Associated With Specific Conditions

Fluid and electrolyte disorders due to decreased fluid intake, drug side effects, or hypoglycemia can cause muscle cramps in older adults. *Hyponatremic cramps*, however, occur only when hyponatremia is accompanied by salt depletion (McGee, 1990), as induced by severe diarrhea, a salt-free diet, or hemodialysis treatment. Hyponatremic cramps are cured by fluid and saline substitution. No cramps occur in patients with hyponatremia and normal or expanded total body sodium, such as in the syndrome of inappropriate secretion of antidiuretic hormone or uremia. Commonly, prescribed drugs such as diuretics, selective serotonin reuptake inhibitors, or carbamazepine can induce hyponatremia in the elderly and have to be considered as a potential cause when cramps occur. Muscle cramps related to hypoglycemia are relieved by glucose substitution.

Hemodialysis leg cramps are a common complication during dialysis treatment. Cramps can occur toward the end of a dialysis session or under a high ultrafiltration rate, when large amounts of fluid must be drawn. Dialysis cramps are immediately relieved by intravenous injection of hypertonic dextrose or hypertonic saline and can be prevented by using a high-sodium dialysate.

Drug-induced cramps are associated with diuretics, nifedipine, beta agonists, steroids, morphine, cimetidine, penicillamine, statins, lithium, and alcohol (Butler, Mulkerrin, & O'Keeffe, 2002). The cramps usually reverse after drug cessation.

Lower motoneuron diseases such as amyotrophic lateral sclerosis, polyneuropathies, recovered poliomyelitis, peripheral nerve injury, and nerve-root compression are associated with muscle weakness, muscle hypotrophy, and other signs of muscle denervation. These cramps are particularly difficult to treat; the prognosis is closely linked to the underlying disease.

RETO W. KRESSIG

Internet Resources

American Academy of Orthopedic Surgeons
http://www.aaos.org

National Institutes of Health
http://clinicaltrials.gov

Mayo Clinic
http://www.mayoclinic.com

University of Maryland Medical Center
http://www.umm.edu

REFERENCES

Abrams, G. A., Concato, J., & Fallon, M. B. (1996). Muscle cramps in patients with cirrhosis. *American Journal of Gastroenterology*, *91*, 1363–1366.

Butler, J. V., Mulkerrin, E. C., & O'Keeffe, S. T. (2002). Nocturnal leg cramps in older people. *Postgraduate Medical Journal*, *78*, 596–598.

Jacobsen, J. H., Rosenberg, R. S., Huttenlocher, P. R., & Spire, J. P. (1986). Familial nocturnal cramping. *Sleep*, *9*, 54–60.

Jansen, P. H., Lecluse, R. G., & Verbeek, A. L. (1999). Past and current understanding of the pathophysiology of muscle cramps: Why treatment of varicose veins does not relieve leg cramps. *Journal of the European Academy of Dermatological Venereology*, *12*, 222–229.

Leclerc, K. M., & Landry, F. J. (1996). Benign nocturnal leg cramps. Current controversies over uses of quinine. *Postgraduate Medicine*, *99*, 181–184.

Man-Son-Hing, M., & Wells, G. (1995). Meta-analysis of efficacy of quinine for treatment of nocturnal leg cramps in elderly people. *British Medical Journal*, *5*, 310, 13–17.

McGee, S. R. (1990). Muscle cramps. *Archives of Internal Medicine*, *150*, 511–518.

MUSCULOSKELETAL SYSTEM

With advancing age degenerative changes in muscle content, nervous system, and the skeleton together produce reduction in physical strength and endurance. A good indicator of the rate of aging of the musculoskeletal system is a person's outward appearance. Changes in muscle associated with aging are numerous. Quantitatively, physiological, biochemical, anatomic, and histocytological measurements of muscle all exhibit decreased levels with age from about the third decade. Approximately 30% of the muscle mass is lost by age 80. This results from the loss of the number and size of muscle fibers. The number of red muscle fibers is greater than white muscle fibers. Sarcomeres are lost from the fibers, resulting in shortened length, thereby reducing the tensile strength and range of contraction. Loss in muscle mass correlates with decreased numbers of myofibrils. Furthermore, there is an associated increased negative nitrogen balance. Contractile units are replaced by fibrous tissue. Changes are also observed in the sarcolemma, while the T-tubule system proliferates. Some age-related loss in motor neurons is also encountered; therefore, one perceives an increased effort requirement for muscle to work against a particular load as an increased number of motor units must be activated. The neuromuscular Junction areas are reduced in size, while the membranes at the motor end plates unfold. Measurements of the ATP levels of muscle show significant reductions, as do ATP:ADP ratios and glycogen and creatinine phosphate levels. The rate of Ca^{2+} transport by the sacroplasmic reticulum is increased. At the periphery of muscle fibers, residual protein synthetic activity occurs, but the product is not organized into new muscle. With age there is a reduction in the frequency of end plate potentials and presumably neurotransmitter release; however, no change in resting membrane potentials is recorded.

Older persons typically show decrease in amplitude, prolongation of action potentials, and an increase in the number of polyphasic potentials, in addition to increased absolute and refractory periods in old muscle. While the latent, contraction, and relaxation periods are lengthened, the rate of peak tension development is lowered. Deterioration with age is also reflected in the specific measurements of isometric and isokinetic performance of muscle. About 20% to 40% of maximal muscle strength is lost by age 65 (Shock, 1967). A general loss of muscle strength is recorded after age 40 (Kohn, 1978).

A determining factor in physical and intellectual performance with age appears to be correlated with the early start of activity and its continued application in life. Studies of gerontologic populations, sports medicine, and epidemiologic occupational performance of individual groups reveal that, while physical exercise cannot reverse the aging process, functional capacity can be increased (Hagan, 1984). The human biological system apparently exhibits significant reserve capacity to maintain excellent function despite degenerative muscle changes (Jokl, 1984).

As with other biological systems, the skeleton, which serves as the structural framework for muscle anchorage, animal stature, locomotion, mineral reserve, organ protection, etc., also undergoes aging. However rugged and durable, the skeleton is subject to subtle changes with time involving both its cellular components and the matrix, making it less capable of sustaining stress. The skeleton is subject to three primary hazards, which include starvation, trauma, and microorganic destruction (Rogers, 1982). Senile atrophy of bone resulting from ongoing age changes produces mechanical weakness which, together with muscle changes, increases the susceptibility of the musculoskeletal system to trauma. Furthermore, the superimposed effects of degenerative joint disease, osteoporosis, and spinal stenosis in so many aging individuals create more imposing and serious medical problems.

Skeletal anatomical age changes can be noted in all bones of the body to one degree or another in which the architecture is changed. Such changes are concomitant with bone strength changes, as reflected in reduced tensile and compressive strength of bone, as well as tortional and bending strengths commencing at about 35 years of age. As a result, the breaking load of bones decreases together with bone hardness and density. The rate of decline of tissue associated with locomotion is highest in muscle, followed by cartilage, bone, and tendon.

Clinical and experimental records indicate that physical activity stimulates bone growth, while inactivity causes bone deterioration. Therefore, increased inactivity in aging individuals, for whatever reason, accelerates the deterioration process. It is understood, however, that the skeletal aging syndrome involves complex relationships between muscles, bones, joints, circulation, nerves, and endocrines.

Architectural and structural changes reflect profound, although subtle, modifications at the histo-logical, ultrastructural, and physiological and biochemical levels of organization, involving both cells and matrices. With increasing age, progenitive bone cells exhibit reduced proliferative activity and potential; following trauma, however, reactivation of cell proliferation occurs, even in the oldest of individuals. This residual activity appears sufficient to ensure adequate emergency bone repair throughout life (Tonna, 1977). Histological and ultrastructural studies reveal reduction in bone cell numbers and alteration of functional osteoblasts to inactive fibrogenicike cells, which show the appearance of lipofuscin granules and exhibit progressive degeneration. Osteoblast to osteocyte conversions cease as osteocytes undergo eventual degeneration and death (Tonna, 1981).

Equally significant to aging bone is the fact that the periosteum (outer surface tissue layer) and the endosteum (inner surface tissue layer) lose viable contact as the intervening osteocytes die and their cytoplasmic projections housed in canaliculi degenerate. Furthermore, the surface layer of bone covered by a continuous sheath of osteoblasts breaks down. The cells lose their cell-to-cell continuity and consequently lose control of positive cellular biofeedback necessary for bone apposition and mineral homeostasis (Tonna, 1978). Some degree of bone remodeling occurs throughout the life-span of the individual. Cells of the endosteal surface retain their functional activities longer than those of the periosteum. Consequently, age changes occur later in time. Changes that occur with age in the matrical compartments and biochemistry of the skeletal system are, as yet, little understood and represent areas for active research. Glycoproteins and sulfated mucopolysaccharides are known to become reduced with age, whereas keratin sulfate exhibits some increase.

For discussion of musculoskeletal research in contemporary literature, see Evans, Williams, Beattie, Michel, and Wilcock (2000), pp. 963–984.

Edgar A. Tonna

See also
Osteoporosis

REFERENCES

Evans, J. G., Williams, T., Beattie, B., Michel, J.-P., & Wilcock, G. (Eds.). (2000). *The Oxford textbook of geriatric medicine* (2nd ed.). Oxford: Oxford University Press.

Hagan, R. D. (1984). The kinematics of aging. In C. L. Nelson & A. P. Dwyer (Eds.), *The aging musculoskeletal system* (pp. 91–102). Lexington, MA: Collamore Press.

Jokl, P. (1984). The biology of aging muscle: Quantitative versus qualitative findings of performance capacity and age. In C. L. Nelson & A. P. Dwyer (Eds.), *The aging musculoskeletal system* (pp. 49–58). Lexington, MA: Collamore Press.

Kohn, R. R. (1978). *Principles of mammalian aging* (2nd ed., p. 170). Englewood Cliffs, NJ: Prentice-Hall.

Rogers, S. L. (1982). Bone strength and bone architecture. In *The aging skeleton* (pp. 17–37). Springfield, IL: Charles C. Thomas.

Shock, N. W. (1967). Physical activity and the "rate of aging." *Journal of the Canadian Medical Association*, *96*, 836–840.

Tonna, E. A. (1977). Aging of skeletal-dental systems and supporting tissues. In C. E. Finch & L. Hayflick (Eds.), *Handbook of the biology of aging* (pp. 470–495). New York: Van Nostrand-Reinhold.

Tonna, E. A. (1978). Electron microscopic study of bone surface changes during aging. The loss of cellular control and biofeedback. *Journal of Gerontology*, *33*, 163–177.

Tonna, E. A. (1981). Electron microscopy of skeletal aging. In J. E. Johnson, Jr. (Ed.), *Aging and cell structure* (Vol. 1, pp. 251–304). New York: Plenum Press.

MUSIC THERAPY

Music is pervasive in our lives, from commercial jingles to musical scores for the movies and television, not to mention the music that we choose to listen to each day. Music affects us in many ways. It can help us relax, reminisce, and generally feel better. The therapeutic benefits of music are well documented and the effects of music can be quite dramatic. This is because music affects the brain on many levels and can be used in therapy to alleviate or help improve certain physical, psychological, and cognitive conditions. Music is not processed in one specific region of the brain but rather is processed in many cerebral and subcortical areas. Rhythm, or the actual pulse or beat pattern of the music, can have a pronounced therapeutic affect. Rhythm can serve as an entrainment device driving cortical rhythms as a result of the auditory stimulation, and certain rhythmic patterns can drive or excite the motor cortex to coordinate movement. In diseases like Parkinson's or stroke, where the internal initiation or sequential patterning of movement may be damaged, cueing of specific patterns through an outside source can allow for such function to be initiated and executed (Thaut, McIntoch, & Rice, 1997).

Music has emotional components and can evoke strong images and associations. The auditory nerve has an almost immediate connection to the limbic area of the brain, including the thalamus, making it easy to induce an emotional response even before the title of the song is recognized or recalled (Tomaino, 1993). Because of the strong associations attributed to songs or particular harmonies, music can affect mood states. Listening to pleasing music can elevate levels of certain neurotransmitters resulting in enhanced mood and reduced discomfort or pain (Blood, Zatorre, Bermudez, & Evans, 1999). If music can stimulate, it can also relax by providing rhythmic patterns that can entrain brain waves to a slower pattern. However, music that is relaxing to one person may not be relaxing to another. Techniques similar to the relaxation exercises used in meditation and yoga can be facilitated with music by cuing slow breathing and entraining slower brain wave patterns. In general, music can be used therapeutically to promote movement, relaxation, self-awareness, learning, communication, self-expression, creativity, social interaction, and personal development.

The Field of Music Therapy

The therapeutic use of music is an ancient concept cited in early literature including the writings of Plato and Aristotle. The professional field of music therapy was established in the United States 56 years ago. In 1998, The American Music Therapy Association was founded as a union of the National Association for Music Therapy (established 1950) and the American Association for Music Therapy (established 1971).

A music therapist is a professional who has undergone rigorous education and training at an approved academic program and completed a 1,000-hour clinical internship under the supervision of a trained music therapist. Upon completion of training, individuals are eligible to sit for the national exam offered by the Certification Board for Music Therapists. Music therapists who successfully complete the independently administered examination hold the music therapist–board certified credential (MT-BC). The National Music Therapy Registry (NMTR) serves qualified music therapy professionals with the following designations: RMT, CMT, and ACMT. These individuals have also met accepted educational and clinical training standards and are qualified to practice music therapy. Many states require music therapists to be licensed; for example, in New York State, music therapists may also have the LCAT (Licensed Creative Arts Therapist) credential.

A growing number of health care facilities offer music therapy as one of their services. Insurance coverage for music-therapy services varies throughout the United States. At present, there are insurance companies that will reimburse for prescribed music therapy if the procedure or service is covered under standard Current Procedural Terminology (CPT) and the service provider has received prior approval by company's case manager to bill for music therapy services for the specific procedure or treatment. Some individuals, who are unable to receive insurance coverage, may choose to pay privately to participate in music therapy.

Music therapy is the systematic use of music within a developing relationship between a professional music therapist and client to restore, maintain, and/or improve physical, emotional, psychosocial, and neurological function. Not only songs are used but also the various components of music; a specific tone or frequency of sound, certain patterns of beat or rhythm, harmony, and melody can be used independently to provide a clinical effect. The music therapist works with a client to explore various types of music and/or actively engage the client in musical improvisations to best assess how music can be applied to maximize therapeutic outcomes.

Benefits of Music Therapy

Music therapy is used in many areas of medical, educational, and psychological treatments. It has been applied to help people with Alzheimer's disease and other types of cognitive impairments to improve memory (Haslam & Cook, 2002; Tomaino, 2000). Many of the songs we remember hold important associations to personal events in our lives. When a person listens to a song of personal importance, even if they cannot remember the name of the song, the feelings and associations connected with that piece of music are very strong. Even a person with dementia or cognitive loss will exhibit feelings to songs of personal importance. In music therapy, the use of familiar music can help improve attention, recognition memory, increase verbalizations, reduce anxiety, and offer other improvements in quality of life. Through interviews with clients and their caregivers, these specific songs are identified so they can be applied in music therapy sessions. Increased physical activity and attention can be encouraged through therapeutic drumming and rhythmic-based activities that allow for spontaneous responses in those with even limited function.

Music therapy may be used in conjunction with rehabilitation therapies to facilitate in the recovery and/or maintenance of physical function. For example, the use of rhythm (i.e., an auditory cue) can help improve walking in those with gait problems (Howe, Lovgreen, Cody, Ashton, & Oldham, 2003). Individuals with motor problems related to Parkinson's disease, stroke, traumatic brain injuries, and multiple sclerosis may find that rhythmic music helps them initiate movement when they get "frozen" or help coordinate the evenness of how they move. Many individuals with these movement disorders have problems with initiation and consecutive movement. Music, particularly rhythm, can become a template for organizing a series of movements. This process is not automatic. The rhythm must stimulate the impulse or will to move in the patient in order for the impulse to transfer into real movement. The music therapist explores various rhythmic patterns or musical styles with the patient to establish which patterns will help with walking, balance, and movement in general. Patients report that by focusing on the rhythm and trying to feel its pulse, they can better walk or perform consecutive tasks where previously they froze or had problems with coordination.

In addition to movement, patients with Parkinson's disease, traumatic brain injuries, or stroke may have problems with articulation in which their speech becomes slurred and unclear. Sometimes this is due to poor breath support and sometimes because of difficulties with the motor aspects of speech (i.e., moving the mouth and tongue to articulate a specific sound). Patients are encouraged to "sing" and sustain single syllables to promote greater breath support. They are also encouraged to tap their hands while they speak because this aids in the coordination and clarity of their speech.

Many individuals who have lost speech (i.e., nonfluent aphasia) due to a stroke may find that they can still sing familiar song lyrics. Music therapists incorporate the singing of words and phrases to facilitate communication. Research is being done to bring new understanding to the similarities between singing and speech in efforts to improve outcomes for persons with nonfluent aphasia.

Music therapy has proven beneficial in many psychological problems, including depression and anxiety. The music therapist encourages musical expression through improvised or composed music that focuses on a specific issue. The client may express verbally or nonverbally, in the music, an emotional response as part of the treatment. This allows the client to cope with feelings related to past issues or those in the present such as current injury, disease, and loss of function or independence. Likewise, it has been applied to help individuals express and deal with their fears, anxieties, mental blocks, and resistances so that they can gain more control over their personal health and quality of life. Participating in music therapy groups—including therapeutic drumming groups, dance and movement groups, and music therapy support groups—can provide an outlet for self-expression and a closer connection to others. Active music therapy can aid in promoting both physical and emotional health and well-being.

Research in both music therapy and in neuroscience show that music can affect function in very profound ways. By understanding the effects of music on emotional, physical, psychosocial, and neurologic function, music therapists are able to enhance function and quality of life for many individuals who can benefit from this innovative treatment.

CONCETTA M. TOMAINO

See also
Creativity

Internet Resources:

American Music Therapy Association
www.musictherapy.org

Certification Board for Music Therapists
www.cbmt.org

Institute for Music and Neurologic Function
www.imnf.org

The World Music Therapy Federation
www.musictherapyworld.de

REFERENCES

Blood, A. J., Zatorre, R. J., Bermudez, P., & Evans, A. C. (1999). Emotional responses to pleasant and unpleasant music correlate with activity in paralimbic brain regions. *Nature Neuroscience*, *2*(4), 382–387.

Haslam, C., & Cook, M. (2002). Striking a chord with amnesic patients: Evidence that song facilitates memory. *Neurocase*, *8*(6), 453–465.

Howe, T. E., Lovgreen, B., Cody, F. W., Ashton, V. J., & Oldham, J. A. (2003). Auditory cues can modify the gait of persons with early-stage Parkinson's disease: A method for enhancing Parkinsonian walking performance. *Clinical Rehabilitation*, *17*(4), 363–367.

Thaut, M. H., McIntoch, G. C., & Rice, R. R. (1997). Rhythmic facilitation of gait training in hemiparetic stroke rehabilitation. *Journal of the Neurological Sciences*, *151*(2), 207–212.

Tomaino, C. M. (1993). Music and the limbic system. In F. J. Bejjani (Ed.), *Current research in arts medicine*. Chicago, Illinois: A Cappella Books.

Tomaino, C. M. (2000). Working with images and recollection with elderly patients. In D. Aldridge (Ed.), *Music therapy in dementia*. London: Jessica Kingsley.

N

NATIONAL ASIAN PACIFIC CENTER ON AGING

The National Asian Pacific Center on Aging (NAPCA) is committed to the dignity, well-being, and quality of life of Asian Pacific Americans (APA) in their senior years. The goals of NAPCA are as follows:

- to advocate on behalf of the APA aging community
- to educate APA seniors and the general public on the needs of the APA aging community
- to empower APA seniors and the aging network to meet the increasing challenges facing the APA aging community

The organization operates employment programs for older workers and conducts policy and research projects among 10 geographic multiethnic and multilingual Asian and Pacific Islander American elder communities. They develop useful, accessible, and accurate information on health care access. Materials on the Medicare, Medicaid, and dual-eligible state buy-in programs and affordable health care for low-income elders and other information are available on its Web site.

EDITORIAL STAFF

Internet Resource

www.napca.org

NATIONAL CITIZENS' COALITION FOR NURSING HOME REFORM

The National Citizens' Coalition for Nursing Home Reform (NCCNHR) was formed to address public concerns about substandard care in nursing homes. NCCNHR is the outgrowth of work first achieved by advocates working for Ralph Nader and later for the National Gray Panthers. Elma Holder, NCCNHR Founder, was working with the Gray Panthers when she organized a group meeting of advocates from across the country to attend a nursing-home-industry conference in Washington, DC, in 1975. Representatives of 12 citizen action groups met and spoke collectively to the industry about the need for serious reform in nursing-home conditions. The consumer attendees were inspired to develop a platform of common concerns and formed a new organization to represent the consumer voice at the national level. Most of the original members had witnessed and endured personal experiences with substandard nursing-home conditions.

NCCNHR's current 20-member board, which includes residents of nursing homes, represents the grassroots membership of concerned advocates of quality long-term care nationwide. Consumer-controlled member groups elect the board and meets quarterly to establish policies and help direct financing and programming issues.

NCCNHR has 200 member groups with a growing individual membership of more than 1,000. NCCNHR's members and subscribers comprise a diverse and caring coalition of local citizen action groups, state and local long-term-care ombudsmen, legal services programs, religious organizations, professional groups, nursing-home employees' unions, concerned providers, national organizations, and growing numbers of family and resident councils.

NCCNHR provides information and leadership on federal and state regulatory and legislative policy development and models and strategies to improve care and life for residents of nursing homes and other long-term-care facilities. Ongoing work addresses issues such as the following:

- inadequate staffing in nursing homes, particularly all levels of nursing staff
- poor working conditions, salaries, and benefits for long-term-care workers
- maintenance of residents' rights and empowerment of residents
- support for family members and development of family councils
- development and support for the long-term-care ombudsman program
- minimizing the use of physical and chemical restraints
- the high cost of poor care, such as pressure sores, dehydration, incontinence, and contracture of residents' muscles
- accountability to taxpayers for nursing-home expenditures and failure to fulfill government contracts

EDITORIAL STAFF

Internet Resource

National Citizens' Coalition for Nursing Home Reform
http://www.nccnhr.org/default.cfm

NATIONAL CONFERENCE OF GERONTOLOGICAL NURSE PRACTITIONERS

The National Conference of Gerontological Nurse Practitioners (NCGNP) was founded in 1981 by a small group of GNPs with the intention of offering the first continuing-education conferences designed specifically to meet the needs of GNPs. Currently, NCGNP represents nearly 3,500 certified GNPs in the United States and a multitude of family and adult nurse practitioners (NPs) in geriatric practice. NCGNP has become the organization of choice for NPs who want to pursue continuing education in geriatric care and who seek peer support from experienced clinicians.

The goals of the NCGNP are as follows:

- advocate quality care for older adults
- promote the professional development of advanced practice nursing
- provide continuing gerontological education for advanced practice nurses
- promote communication and professional collaboration among health care providers
- support research related to the care of older adults

EDITORIAL STAFF

Internet Resource

National Conference of Gerontological Nurse Practitioners
http://www.ncgnp.org/index.cfm

NATIONAL COUNCIL ON THE AGING

The National Council on the Aging (NCOA) is the nation's first association of organizations and professionals dedicated to promoting the dignity, self-determination, well-being, and contributions of older persons. NCOA's 3,800 members include senior centers, area agencies on aging, adult day service centers, faith-based service organizations, senior-housing facilities, employment services, consumer groups, and leaders from academia, business, and labor.

Founded in 1950, NCOA helps community organizations enhance the lives of older adults; turns creative ideas into programs and services that help older people in hundreds of communities; and is a national voice and powerful advocate for public policies, societal attitudes, and business practices that promote vital aging. NCOA was instrumental in the development of Foster Grandparents, Meals On Wheels, Family Friends, and dozens of other innovative programs for older adults.

NCOA provides leadership, technical assistance, tools, and training to community-service organizations. NCOA conducts research and demonstration projects on the impact of promising innovations and supports the adaptation of proven interventions. NCOA also cosponsors community-service jobs for more than 8,400 low-income seniors each year in 19 states.

EDITORIAL STAFF

Internet Resource

www.ncoa.org

NATIONAL GERONTOLOGICAL NURSING ASSOCIATION

The National Gerontological Nurses Association (NGNA) was founded in 1984 and is dedicated to the clinical care of older adults across diverse care settings. Members include clinicians, educators, and researchers with vastly different educational preparation, clinical roles, and interest in practice issues. A striking feature is the substantial number of certified gerontological clinical nurse specialists who select NGNA for membership.

Members of the NGNA work in the following roles:

- staff nurse
- clinical nurse specialist
- manager
- administrator
- clinical educator
- academic educator
- nurse practitioner
- researcher

EDITORIAL STAFF

Internet Resource

National Gerontological Nursing Association
http://www.ngna.org/all.php?l=home&w=800

NATIONAL INDIAN COUNCIL ON AGING

The National Indian Council On Aging, Inc. (NICOA) was founded in 1976 by members of the National Tribal Chairmen's Association that called for a national organization to advocate for improved, comprehensive health and social services to American Indian and Alaska Native elders. NICOA provides leadership and advocacy for Indian aging issues and has been actively involved in public policy and research efforts on federal, state, and local levels. NICOA also acts as a National Sponsor of the federal Senior Community Service Employment Program (SCSEP) in 15 states through a grant from the U.S. Department of Labor.

NICOA's objectives are as follows:

- enhance communications and cooperation with organizations that represent and advocate for Native American elders
- provide information and technical assistance for Native American communities to improve health care for elders
- network to maximize resources and increase the efficiency and effectiveness of the service delivery systems for elders
- provide information, reports, and expert testimony
- provide a clearinghouse for information on issues affecting American Indian and Alaska Native Elders

EDITORIAL STAFF

Internet Resource

www.nicoa.org

NATIONAL INSTITUTE ON AGING

The National Institute on Aging (NIA), one of the 27 Institutes and Centers of the National Institutes of Health, leads a broad scientific effort to understand the nature of aging and to extend the healthy, active years of life. In 1974, Congress granted authority to form NIA to provide leadership in aging research, training, health-information dissemination, and other programs relevant to aging and older people. Subsequent amendments to this legislation designated the NIA as the primary federal agency on Alzheimer's disease research.

NIA's mission is to improve the health and well-being of older Americans through research and, specifically, to:

- support and conduct high-quality research on aging processes, age-related diseases, and special problems and needs of the aged
- train and develop highly skilled research scientists from all population groups
- develop and maintain state-of-the-art resources to accelerate research progress
- disseminate information and communicate with the public and interested groups on health and research advances and on new directions for research

NIA sponsors research on aging through extramural and intramural programs. The extramural program funds research and training at universities, hospitals, medical centers, and other public and private organizations nationwide. The intramural program conducts basic and clinical research in Baltimore, MD, and on the NIH campus in Bethesda, MD.

EDITORIAL STAFF

Internet Resource

The National Institute on Aging
http://www.nia.nih.gov/AboutNIA/

NATIONAL LONG-TERM-CARE OMBUDSMAN PROGRAM

Nursing-home residents and their families and friends often face situations that they would like to discuss with someone who could help them understand and resolve the issues. The long-term-care ombudsman is a trained advocate to protect the health, safety, welfare, and rights of residents of nursing homes, board and care facilities, and assisted-living facilities, many of whom are elderly, frail, and isolated from their communities. Ombudsmen work to promote residents' rights, quality of care, and quality of life and to facilitate change at local, state, and national levels to improve care. Thousands of volunteers and paid staff regularly visit long-term-care facilities to monitor care, observe staff–resident interactions and the physical environment, and voice the concerns of residents who lack family or are otherwise unable to speak and advocate for themselves.

The word *ombudsman* derives from the Swedish language and connotes a public official appointed to investigate citizens' complaints against local or national government agencies that may be infringing on individuals' rights. Ombudsmen are also described as liaisons, supporters, and friends who can provide information and guidance.

The Long-Term-Care Ombudsman Program (LTCOP) first appeared in 1972 as a five-state demonstration program in response to widespread reports of poor quality in nursing homes. The LTCOP operates in all 50 states, Washington, DC, and Puerto Rico. Under the aegis of the Older Americans Act (OAA) since 1978, the LTCOP is funded under Title VII (i.e., Vulnerable Elder Rights Protection Activities), with additional funding from state and local governments and community agencies. The Office of the State LTCOP is most often housed in the state unit on aging. Each state designates a long-term-care ombudsman who is responsible for developing a statewide program to identify, investigate, and submit complaints on behalf of residents. Local or regional ombudsmen are typically located in area agencies on aging; however, many are sponsored by private programs and legal services.

Ombudsmen are not regulators or surveyors. Their role is to identify and resolve problems on behalf of residents. Their responsibilities, described in Title VII of the OAA, include representing residents' interests before government agencies and seeking administrative, legal, and other means to redress those interests; consumer education and facilitation of public comment on laws, policies, and actions; technical support for new or ongoing resident and family councils; and analysis and comment on recommended changes in laws and regulations applicable to long-term-care residents.

Ombudsmen receive training on residents' rights and how these rights should be respected by long-term-care facilities. Additional training can include problem solving and conflict resolution, communication, administrative and clinical structure of nursing home care, and interviewing.

Each year, more than 1,000 paid ombudsmen and 8,400 certified volunteer ombudsmen visited facilities and address more than 250,000 complaints. These complaints were about meals; lost items; resident care (32% of all issues), including personal care, restraints, and rehabilitation; and residents' rights (31%), such as personal rights, admissions and evictions, and abuse and neglect. More than 70% of complaints are resolved to the satisfaction of the resident or complainant. If a problem is not resolved, the ombudsman can suggest alternatives, such as filing a complaint with the state's regulatory agency.

Ombudsmen meet with facility staff and residents to educate them about residents' rights. Ombudsmen can attend resident and family councils in the facility and encourage residents and families to do so as well.

A resident or family member's name cannot be used in the follow-up of a complaint unless permitted by the resident or person acting on the resident's behalf. Ombudsman records are also confidential and cannot be read by facility staff.

Ombudsmen encourage residents and families to use the care-planning process to ensure that residents receive individualized care. Care-planning sessions are held quarterly or when changes in the resident's condition warrant and should include facility staff (including nursing assistants), family, and the resident. The ombudsman can suggest how to make these sessions more productive and how to use the sessions to address problems. At the resident's request, the ombudsman may attend the care-planning session to advocate for and assist the resident. In addition, ombudsmen work to address systemic issues to improve quality of care.

Families use the LTCOP for assistance in finding facilities for their loved ones. Among other things, families are advised to examine the most recent survey (i.e., inspection) results, which must be posted in a visible, accessible location in every nursing home and can also be found on the Nursing Home Compare Web site. Families are encouraged to visit facilities at different times of the day to observe the care being given and to ask specific questions about staff availability and training, activities, and meals. Many ombudsman programs have directories of facilities in the area that are made available to prospective residents and families. They provide explanations of the differences between nursing homes and assisted-living facilities and information about community alternatives such as adult day care and home care.

Program effectiveness varies from program to program, often due to the limited number of ombudsmen. Long-Term-Care-Ombudsman efforts are summarized in the National Ombudsman Reporting System (see the Administration on Aging Web site) data to include the number of facilities visited, the types of complaints handled, and the kinds of complaints filed with ombudsmen. Data have been collected since 1996 and give a good picture of the extent of ombudsman activities nationally and in every state. A 2001 report compares national data from FY 1996–2001. Additional research is needed on the association between ombudsman efforts at the individual and system levels and specific quality-of-care and quality-of-life outcomes.

The Ombudsman Resource Center, housed at the National Citizens' Coalition for Nursing Home Reform in Washington, DC, provides technical assistance, training, and referrals. To find an ombudsman, contact the center at 202-332-2275, or visit its Web site.

EDITORIAL STAFF

Internet Resource

Administration on Aging LTC Ombudsman National and State Data
http://www.aoa.gov/prof/aoaprog/elder_rights/LTCombudsman/National_and_State_Data/2004nors/2004nors.asp

National Long-Term-Care Ombudsman Resource Centervhttp://www.ltcombudsman.org/

Consumer Coalition on Assisted Living
http://www.ccal.org

Eldercare Locator
http://www.eldercare.gov/Eldercare/Public/Home.asp

National Citizens' Coalition for Nursing Home Reformvhttp://www.nccnhr.org

Nursing Home Compare, Health Care Financing Administration
http://www.medicare.gov/NHCompare/

NATURALLY OCCURRING RETIREMENT COMMUNITIES (NORCs)

The term *Naturally Occurring Retirement Community* (NORC) was first coined in 1984 by Michael E. Hunt and describes age-integrated housing developments, buildings, and neighborhoods that were not planned or designed for older people but have evolved to house large heterogeneous concentrations of people 60 years of age or older who are aging in place (Hunt & Hunt, 1985). Such concentrations of older people have made possible a new model—the NORC Supportive Service Program (NORC-SSP)—to redesign service delivery systems and transform these communities into good places to grow old.

The NORC Phenomenon

As far back as 1989, a survey by the American Association of Retired Persons (AARP) found that 27% of all older Americans live in NORCs, compared with 6% in planned senior-housing or retirement communities (AARP, 1992). Unlike purpose-built senior-housing or retirement communities, which have their own entrance (and, often, exit) criteria, physical design elements, services, and supports, NORCs cannot be built or developed. They evolve over time and can emerge as a result of in-migration when people at or near retirement relocate. NORCs can evolve in communities that have experienced a large out-migration of younger people, leaving behind older residents, who cannot leave their homes of many years However, the predominant evolution of NORCs results from long-time residents of a community aging in place in their homes of long-standing. Repeated studies by AARP have confirmed that older people, including today's baby boomers, expect to remain in their own homes as they age (AARP, 1992).

As the number of people older than the age of 65 increases, NORCs will be a fact of life throughout the United States as increasing numbers of people age in place, significantly changing the composition of many American communities. Many of these communities are or will become NORCs as the proportion of older residents living in them increases. In 1994, Lanspery & Callahan identified nearly 4,500 census block groups across the United States as potential NORCs using data from the 1990 census data.

Recognizing that sufficient age-related density provides an opportunity to redesign service delivery to achieve economies of scale, Lanspery & Callahan (1994) defined density both as a numeric count (i.e., minimum of 200 heads of household 65 years of age or older) and a percentage of the population (40% or more of households where the head of household was 65 years of age or older).

The NORC Supportive Service Program Model (NORC-SSP)

The NORC-SSP is a partnership between housing entities or neighborhoods, the residents, health and social service providers, government, and philanthropy to organize and locate a range of coordinated health, social services, and group and community-building activities on-site with the goal of promoting "healthy" and "successful" aging and providing calibrated supports as individual needs change. It builds on the critical role that communities play in how well people age and the important resources that must be marshaled to support people of all functional abilities. "Community and neighborhood are important. So is the level of positive integration, neighborliness, looking out for others . . . which is . . . associated with higher life expectancy and better health" (Suzman, 2003). Staffed by teams of social workers and nurses, with the older residents having multiple volunteer roles, residents are eligible for participation on the basis of age (i.e., 60 years and older) and residence (i.e., live in the NORC). The NORC-SSP provides a full range of the following services.

Social work services utilize the ecological systems theoretical framework to provide information and referral; benefits and entitlements advocacy; biopsychosocial assessment and casework support; service coordination; counseling; monitoring for changing status of clinically complex or fragile individuals; assistance negotiating the systems and services available under the public programs; and education and support for clients, family members, and paid and unpaid caregivers.

Health-care-related services utilize both population-based community health principles and individual-care-management protocols. Services include individual care management to help individuals live with and manage chronic conditions and address acute situations, nonreimbursable but necessary monitoring; care coordination; support to maintain frail individuals at home; physical assessments, regular blood pressure monitoring, and individual instruction; advocacy in negotiating the myriad health care systems; coordination with primary care physicians and on-site social workers; and health promotion, prevention, and wellness programs.

Diverse educational and recreational opportunities are designed to engage a broad mix of the older residents. Lectures on many topics, an array of classes, discussion and support groups, health chats with health care professionals–the list is limitless and is often defined by the residents themselves. Many of these activities are identified and led by residents.

Community engagement through volunteer opportunities makes it possible for older people to take on new community roles as program ambassadors, leaders, and program extenders in addition to that of consumers of service. Their knowledge and understanding of their communities are essential to informing the planning process during a program's formative stages; setting priorities as programs evolve; and identifying the resources, talents, and skills within each community that can be harnessed.

Ancillary services are often developed in response to the unique needs or local conditions of the NORC. Programs have the flexibility to develop additional supports and services that draw on the social capital found within the NORC as well as leverage the resources found in the larger surrounding community it. Younger residents volunteer transportation services; residents who are retired accountants and bookkeepers provide program-supervised daily money management assistance in communities in which residents have little or no family close by; on-site geropsychiatry services are leveraged from a local hospital in a significantly aged-in community; and local fund-raising efforts help subsidize emergency home care in a community with limited resources or access to in-home services.

The success of a NORC-SSP depends on a thorough understanding of the community (i.e., demographics, physical, and topographical characteristics; resources and services; history; culture; leadership; communication patterns; and the level of social integration) and the organization of a strategic, programmatic, and financial partnership that has a clear vision. The social service agency partner provides social work staff and often has the key leadership role in managing the partnership and the on-site services. The health care partner provides the on-site nurse and often brings other resources to the program (including health educators, specific medical or health services, and analytic resources). In New York, which has the largest complement of programs in the nation, the health partner is typically a hospital system, nursing home, or home care agency.

Funding for NORC programs is through a public-private partnership that includes government grants (between $75,000 and $250,000 in New York), local matching funding from the housing entity or community, philanthropic support, a mix of user fees for group services, local fund-raising efforts, and leveraging in-kind contributions. Operating budgets for New York's programs (based on available 2005 data) range from $181,000 for a program in a single-building NORC; more than $350,000 in a neighborhood of almost 1,900 homes; to more than $700,000 in a mature and multidimensional program in a large housing development with more than 4,500 older residents (Vladeck, 2004).

Current Efforts

The prototype of the NORC-SSP housing-based model was developed in 1986 in a moderate-income high-rise housing development in New York City (Vladeck, 2004). Based on successful replication in two other housing developments, in 1995, New York State enacted the legislation and funding to establish the first public policy to encourage the development of NORC-SSPs in housing developments that met state-specific older-population density requirements. New York City government followed suit in 1999. In 2005, New York State modified legislation to add the neighborhood-based model to its public policy approach in order to address the need for NORC-SSPs in suburban-like, low-rise, or single-family homeowner neighborhoods in which there is no common ownership.

Today, more than 80 programs across the country have received public support. The majority of the NORC-SSPs (i.e., 45) are in New York. NORC-SSP legislation has been enacted and ongoing funding has been established by both state government ($4.4 million) and New York City's government ($6.5 million) to support both housing- and neighborhood-based NORC-SSPs. An equal amount of private support (i.e., cash and in-kind resources) rounds out the budgets of these programs. Other states are considering similar approaches.

Interest in this model has also taken hold at the federal level. Recognizing that aging in place is occurring in many communities across the country, since 2002, Congressional grants have been awarded to nonprofit agencies in 42 different localities (located in 25 states) for NORC program development. Administered through the USDHHS Administration on Aging (AoA), these efforts are underway in many housing developments and neighborhoods.

Based on the experiences and the imperative to redesign our delivery systems, legislative language has been introduced to amend the Older Americans Act (OAA) to create a national demonstration project for NORC-SSPs. In anticipation of action at the federal level, the Aging in Place Initiative at the United Hospital Fund (i.e., a research, philanthropic, and policy organization in New York) is developing the NORC Action *Blueprint*, drawing on the experiences of program developers, leaders, and experts representing efforts in seven states to help guide the development of successful NORC-SSPs in the future (Vladeck, 2004).

FREDDA VLADECK

See also
Retirement

Internet Resources

American Journal of Public Health
http://www.ajph.org/cgi/content/abstract/AJPH.2005.068262v1?ct=ct

American Medical Directors Association
http://www.amda.com/publications/caring/october2002/norcs.cfm

Brookings Institution
http://www.brookings.edu/metro/pubs/20060215_FirstSuburbs.pdf

Joint Center for Housing Studies of Harvard University
http://www.jchs.harvard.edu/publications/seniors/lawler_w01-13.pdf

United Hospital Fund of NYC
http://www.uhfnyc.org/pubs-stories3220/pubs-stories_show.htm?doc_id=203833

U.S. Department of Health and Human Services
http://aspe.hhs.gov/daltcp/reports/NORCssp.htm

REFERENCES

AARP (1992). *Understanding senior housing for the 1990s: Survey of consumer preferences, concerns, and needs*. Washington, DC: AARP.

Hunt, M. E., & Hunt, G. (1985). Naturally occurring retirement communities. *Journal of Housing for the Elderly*, *3*(3/4), 3–21.

Lanspery, S., & Callahan, J. (1994). *Naturally occurring retirement communities: A report for the Pew Charitable Trust*. Boston, MA: Policy Center on Aging, Heller School, Brandeis University.

Suzman, R. (July 31, 2003). North Dakota town's payoff for hard lives is long life. *New York Times*, A22.

Vladeck, F. (2004). *A good place to grow old: New York's model for NORC-supportive service programs*. New York: United Hospital Fund.

NEUROLOGICAL CHANGES IN THE ELDERLY

Aging is a gradual process and is associated with predictable changes of the nervous system in most elderly individuals. These age-related changes are part of the aging process and should not be considered disease states. Neurological diseases in the elderly are common but can only be properly diagnosed and assessed if normal age-related changes are understood. These usual changes in neurological function frequently raise concern among older adults about the development of a disease. After a proper evaluation, they should be reassured that they are progressing through a natural process and no disease is present.

The nervous system consists of cognitive, sensory, motor, and autonomic subsystems whose functions are integrated in the brain. Expected age-related changes occur in all of these subsystems, and it is the sum of these changes that is perceived by the older adult and family members. One outcome of these cumulative changes is falls, which are common in healthy elderly individuals (Victor & Ropper, 2001). Falls are caused by the cumulative effect of subtle changes in sensory, motor, autonomic, and cognitive subsystems of the nervous system.

Cognitive Changes

Expected changes in the cognitive system are mild to moderate and do not impair the ability to independently participate as a fully contributing member of society. Terms such as *senility* and *senile dementia* are no longer considered appropriate. Normal aging does not include the development of dementia or significant cognitive changes. Instead, a series of minor changes occur, which have a minimal effect on functioning. However, perceptive older adults do notice these cognitive changes and frequently seek out evaluations, which should be thorough before simple reassurance is provided. Formal neuropsychological evaluation is a valuable tool and should be performed when feasible to compare individuals to age-matched controls. Depression in the elderly, a treatable disorder, can frequently cause these cognitive changes to seem more severe and disabling.

Memory impairment is the most common cognitive change reported by elderly individuals. Reduced ability to register new information into memory is a usual change of aging (Barclay, 1993). The process of registering new memories is termed *encoding*. Although encoding ability is generally reduced with advancing age, elderly individuals can still encode well if the information is presented at a slower pace with rehearsal (Sirven & Malamut, 2002). In addition, recall of previously encoded memories is only mildly reduced in most individuals. The use of memory cues is very beneficial in improving recall of stored memories.

Language is a complex cognitive function that involves multiple circuits in the brain. Language functions include naming, fluency, reading, writing, repetition, and comprehension. To a large extent, language function is preserved with aging. However, many older adults do experience mild difficulty naming, called the "tip-of-the-tongue" phenomenon. Research studies have demonstrated that when elderly individuals are confronted with items to name, their naming ability does decrease with advancing age (LaBarge, Edwards, & Knesevich, 1986). However, this does not interfere with daily functioning.

Attention is a cognitive function responsible for maintaining focus during a task. The ability to selectively attend to a task and filter out distractions decreases to a mild degree with aging. Other cognitive functions that have been demonstrated to diminish with aging include abstract reasoning and working memory.

Sensory Changes

Sensory changes are common in the elderly and involve most sensory systems to some extent. The sensory systems typically affected include vision, hearing, vibratory sense, vestibular sense, taste, and smell. Usual changes to the visual system include progressive smallness of the pupils, decreased pupillary reaction to light and accommodation, farsightedness, poor convergence, limited upward gaze, and increased sensitivity to glare (Victor & Ropper, 2001). Changes in ability to see objects (i.e., visual acuity) are not part of the aging process and, if present, suggest an underlying disease state of the eye, such as macular degeneration or cataracts. Hearing loss, especially to higher pitched tones, is progressive throughout aging and is caused by loss of receptors in the sound-detection apparatus of the inner ear. Vibratory sense predictably diminishes with aging, and isolated impaired vibratory sense in an older adult should not be assumed to be due to a disease of peripheral nerves. Of note, joint position sense does not typically diminish with aging. Vestibular sensation is responsible for determining head position and movement and typically deteriorates with aging, occasionally triggering a low-grade sense of feeling off-balance. The senses of smell and taste (to a lesser extent) both diminish with normal aging.

Motor Changes

The motor system is responsible for the initiation, programming, coordination and performance of movements, including gait. The motor changes of aging are usually noticeable to the independent observer and include diminished reaction time, reduced muscle bulk and strength, impaired coordination, and a characteristic change in gait. The number of motor nerve cells decreases with age, likely explaining progressive thinning of muscles. The decrease in strength typically affects proximal muscles, especially in the legs. A decrease in agility usually occurs and may be explained by increased tone in the muscles of older adults. Due to these motor changes, common functions like dressing, rising from a chair, and climbing stairs may take more time with advancing age, but can still be performed independently by most older individuals.

Gait changes in the elderly are common and progress very gradually. This is in distinction to most diseases affecting the gait in which the deterioration is less gradual. Typical changes of the gait include general slowing, shortening of the steps, slight stooping of the posture, and a slightly reduced arm swing. Some use the term *cautious gait* to describe the slight hesitation and inelasticity of the gait in the elderly. Shuffling gait and extreme slowness are not typical and may represent an underlying disease of the motor control system (i.e., Parkinson's disease). Frank ataxia (i.e., lack of coordination) of gait is not a usual feature of aging, but elderly adults may demonstrate some isolated degree of difficulty performing tandem gait, or heel-to-toe walking.

Autonomic Changes

The autonomic nervous system is responsible for regulation of visceral functions. In the elderly, autonomic function is somewhat impaired. This may lead to decreased ability of blood vessels to react to changes in posture, known as *poor vascular tone*. One result of poor vascular tone is a drop in the blood pressure when the elderly individual stands up. This phenomenon is known as *orthostatic hypotension* and accounts for a minority of falls in the elderly (Victor & Ropper, 2001).

Neurological changes in the elderly invariably develop with advancing age, but the age of onset and the rate of deterioration in function vary among individuals. Research is ongoing to determine genetic and environmental factors that may explain these differences between individuals. One major theory explaining the changes of aging in the brain and the rest of the body is the oxidative stress theory.

Oxidative stress is caused by cellular damage induced by free radicals (Beal, 2005). These free radicals are the by-products of cellular energy systems and are neutralized by antioxidants. Experiments in mice have shown that over-expression of a certain antioxidant does increase life span (Schriner et al., 2005). Understanding these and other factors could potentially allow for the development of novel therapies to slow the aging process in humans.

JOSEPH E. SAFDIEH

See also
Neuropsychological Assessment

Internet Resources

National Institutes of Health Senior Health Guide
http://www.nihseniorhealth.gov/

Strong Health Aging Successfully
www.stronghealth.com/services/seniors/aging/preventinginjury.cfm

UCSF Memory and Aging Center
www.memory.ucsf.edu/Education/Topics/normalaging.html

Wayne State University Institute of Gerontology
http://www.iog.wayne.edu/

REFERENCES

Barclay, L. (1993). *Clinical Geriatric Neurology*. Philadelphia: Lea & Febiger.

Beal, M. F. (2005). Less stress, longer life. *Nature Medicine*, *11*(6), 598–599.

LaBarge, E., Edwards, D., & Knesevich, J. W. (1986). Performance of normal elderly on the Boston Naming Test. *Brain and Language*, *27*(2), 380–384.

Schriner, S. E., Linford, N. J., Martin, G. M., Treuting, P., Ogburn, C. E., Emond, M., et al. (2005). Extension of murine life span by overexpression of catalase targeted to mitochondria. *Science*, *308*(5730), 1909–1911.

Sirven, J. I., & Malamut, B. L. (2002). *Clinical Neurology of the Older Adult*. Philadelphia: Lippincott Williams & Wilkins.

Victor, M., & Ropper, A. H. (2001). *Adams and Victor's principles of neurology*. New York: Medical Publications Division, McGraw-Hill.

NEUROPSYCHOLOGICAL ASSESSMENT

Neuropsychological assessments provide neuropsychologists, neurologists, and psychiatrists with important information about the sensory, motor, and cognitive status of patients suffering from a variety of psychiatric and neurological disorders. These tests, which allow neuroscientists to study possible brain–behavior relationships, are often standardized through the establishment of norms based on administration of the assessments to a large number of individuals. Neuropsychological tests should demonstrate high levels of reliability (i.e., generate results that are reproducible) and show good validity (i.e., measure reasonably well whatever the test is intending to measure). Some of these assessments are manually administered whereas others are computerized. One of the most frequently consulted compendia of neuropsychological assessment (Lezak, Howieson, & Loring, 2004) catalogues many hundreds of these test instruments.

Historical Trends

Many of the same events that help shaped the history of neuropsychology also influenced the development of neuropsychological assessment methodology. Additionally, the fields of educational and clinical psychology, with their emphasis on studying mental processes from the "normative" perspective, greatly contributed to the approach currently used in neuropsychological assessment. Namely, by defining the age-adjusted range of performance among normal individuals, statistically defined criteria for establishing abnormal performance were developed for a wide variety of cognitive domains. Another influence came from the experimental studies of cognitive function in animals, normal humans, and patients with localized brain lesions. Through the 20th century, scientists and clinicians evolved tests that were sensitive to neuropsychological change, particularly following brain damage due to head trauma and stroke. For example, many soldiers returning home after both World Wars had received penetrating missile wounds to the head, producing brain lesions limited to specific regions. It was imperative to have tests to document neuropsychological deficits associated with these lesions, determine which functions remained intact, and allow for the development of rational plans of treatment and rehabilitation (Lezak et al., 2004).

Many neuropsychological tests require that the subject has a basic mastery of English. This requirement presents significant challenges for the assessment of people from varying ethnic backgrounds. Recent efforts have produced a number of translations of important neuropsychological tests into several languages, especially into Spanish. The great cultural diversity that is such an integral part of our society today mandates that accelerated efforts be expended in translating and obtaining appropriate norms on many more neuropsychological assessments in the future.

Goals of Neuropsychological Assessment

Neuropsychological tests serve a variety of purposes (Lezak et al., 2004). These assessments are often used in clinical settings to help diagnose psychiatric and neurological disorders or to assist in prognosis. For example, neuropsychological testing is an essential part of the clinical evaluation of Alzheimer's disease and other dementias, documenting that a sufficient amount of cognitive decline has occurred to warrant the diagnosis. Results from these assessments are also useful in making differential diagnoses and predicting outcome.

To the extent that neuropsychological assessments provide an estimate of the patient's cognitive status, these tests have become an integral part of patient care and planning, including treatment planning and remediation. Neuropsychological tests are routinely used to assess treatment efficacy of rehabilitation programs and pharmacological treatment trials. For instance, neuropsychological tests of memory and other cognitive functions are an integral part of most assessments of antidementia drugs; patients on the active compound must evidence more improvement (or less decline) in cognition compared to those on placebo.

Neuropsychological testing has become a significant part of forensic science. These evaluations are used in legal proceedings to document loss of neuropsychological function due to accidents or other causes of brain damage. Similarly, because adequate levels of cognition are required for a defendant to stand trial, neuropsychological evaluations are often vital in establishing whether the case will be dismissed. Finally, cognitive neuroscientists frequently use neuropsychological assessments for basic research in brain–behavior relationships. This application has greatly accelerated since the widespread availability of structural and functional neuroimaging scans, providing accurate measurements of brain anatomy and activity for correlation with neuropsychological test performance.

Organization of Assessments

Neuropsychological tests are often classified by the cognitive domain they are designed to assess. Table N.1 provides a brief outline of such an organization scheme. This scheme is not meant to be exhaustive but rather indicates a representative classification of selected domains, subdomains, and associated tests.

Neuropsychological assessments are often organized into test batteries. This refers to combining a group of individual tests together for one of several goals: (1) to measure a particular cognitive domain (e.g., attention, memory, language, reasoning) or behavioral function (e.g., sensory or motor); (2) to evaluate behaviors presumed to be mediated by a specific brain region (e.g., frontal lobe, parietal lobe); or (3) for other purposes such as a screening for a suspected disorder or syndrome (e.g., dementia, aphasia). Some batteries are designed to be quite brief (i.e., 10 to 30 minutes) such as those often given to patients undergoing pharmacological treatment trials during an extended observation interval of months to years. For example, in elderly patients who are being treated with antidementia drugs, targeted domains such as attention, memory, and language function may be assessed

TABLE N.1 Classification of Selected Cognitive Domains and Examples of Neuropsychological Assessments Designed to Evaluate the Domain

Cognitive Domain	Subdomain	Neuropsychological Test[1]	Description of Task
Attention	• Vigilance (sustained attention) • Complex Attention	Continuous Performance Test (CPT) Digit Symbol Substitution Test (DSST)	Letters of the alphabet appear randomly on a computer screen, and subjects are asked to respond each time the letter "X" appears. Requires rapid drawing of appropriate symbols below randomly arranged numbers while referencing a number-symbol code.
Psychomotor	• Gross Motor Speed • Fine Motor Function • Complex Motor Function and Praxis	Finger-Tapping Speed Grooved Pegboard Test Assembly Test of the Purdue Pegboard	Requires the subject to tap a lever arm with the index finger as rapidly as possible for 10 seconds. Requires the speeded placement of slotted pegs into slotted holes with each hand. Requires asymmetric hand movements to rapidly assemble simple 3-D constructions.
Memory	• Short-Term • Long-Term	Digit Span Logical Memory	Requires the subject to repeat a series of numbers, in precise order, immediately after they are verbally delivered. Requires the subject to repeat the contents of a verbally delivered paragraph, immediately and after a 30-minute delay.
Language	• Vocabulary • Confrontation Naming • Verbal Fluency	Wechsler Vocabulary Test Boston Naming Test (BNT) Controlled Oral Word Association (COWA) Test	Requires the subject to define words, arranged in order of difficulty. Subjects are shown large ink drawings of items, ranging from common to rarely seen. Subject must name the item. Subjects are given a letter of the alphabet and have 1 minute to say as many words that they can think of that begin with the given letter.
Executive Function	• Flexible Thinking/Set Breaking	Trail Making–Part B	Subjects must draw lines connecting a series of numbers and letters by alternating between ascending number and letter sequences.

[1] Descriptions and references for these tests are in Lezak et al. (2004) and Kolb & Whishaw (2003).

briefly on each visit. On the other hand, some batteries probe deeply into one or more domains of function. Thus, a comprehensive memory battery could contain tests that evaluate verbal versus spatial memory, short-term versus long-term memory, or declarative versus nondeclarative memory. Several well-known test batteries, such as the Halstead-Reitan and Lauria-Nebraska, contain many subtests, require multiple hours to administer, and attempt to provide a detailed summary of functioning in a number of important sensory, motor, and cognitive domains (Banich, 1997).

Geriatric Neuropsychological Assessment

Neuropsychological assessment has helped to establish the range of neuropsychological functioning in normal aging, mild cognitive impairment (MCI), and dementia. Studies have found that tests of memory, language, and psychomotor function are useful in discriminating normal from MCI/dementia cases (Kluger et al., 1997) as well as accurately predicting which nondemented individuals will decline to dementia several years later (Kluger et al., 1999).

Future Directions

Advancement in neuro-imaging technology as well as the refinement of neuropsychological assessments capable of being administered concurrently with the acquisition of the images are already providing a wealth of new information about brain–behavior relationships in normal and pathologic function. These approaches will likely lead to new knowledge about how brain regions interact in a network fashion while mediating neuropsychological challenges.

Although the majority of neuropsychological assessments are currently conducted in private-practice offices, hospitals, and research centers, other assessment venues are under development. These include expansion of the use of portable computerized testing devices for rapid assessment following athletic injury or natural disaster; increase in the availability of mobile units that would allow neuropsychologists to visit community centers and nursing homes (e.g., to screen for dementia); and progress in designing neuropsychological test procedures for assessment over the Internet, permitting large groups of individuals undergoing drug-treatment trials to receive brief evaluations between regular visits to the clinic.

Alan Kluger
James Golomb

See also

Dementia: Overview
Mild Cognitive Impairment: Controversy in Nomenclature and Treatment
Neuropsychologists
Vascular and Lewy Body Dementias

Internet Resources

American Psychological Association Division 40
http://www.div40.org/

Neuropsychology Central.
http://www.neuropsychologycentral.com/

REFERENCES

Banich, M. T. (1997). *Neuropsychology: The neural bases of mental function*. Boston: Houghton Mifflin Co.

Kluger, A., Ferris, S. H., Golomb, J., Mittelman, M. S., & Reisberg, B. (1999). Neuropsychological prediction of decline to dementia in nondemented elderly. *Journal of Geriatric Psychiatry and Neurology*, *12*, 168–179.

Kluger, A., Gianutsos, J. G., Golomb, J., Ferris, S. H., George, A. E., Franssen, E., & Reisberg, B. (1997). Patterns of motor impairment in normal aging, mild cognitive decline and early Alzheimer's disease. *Journal of Gerontology: Psychological Sciences*, *52B*, 28–39.

Kolb, B., & Whishaw, I. Q. (2003). *Fundamentals of Human Neuropsychology* (5th Ed.). New York: Worth.

Lezak, M. D., Howieson, D. B., & Loring, D. W. (2004). *Neuropsychological Assessment* (4th Ed.). New York: Oxford University Press.

NEUROPSYCHOLOGISTS

Broadly defined, neuropsychology is the study of the relation between brain function and behavior. Neuropsychologists work within this area of study, endeavoring to describe, explain, predict, and change behavior (Elias & Saucier, 2006). Typically, neuropsychologists are trained in psychology, but the designation is sometimes extended to behavioral neurologists, psychiatrists, and other professionals engaged in examining brain–behavior relationships. Distinctions are often drawn between experimental and clinical neuropsychologists. Whereas experimental neuropsychologists occupy themselves with explaining how patterns of behavioral impairments can be understood in terms of disruptions to regions of the nervous system, clinical neuropsychologists focus more on using psychological tests to characterize a variety of psychiatric and neurological disorders and are often involved in management and rehabilitation issues (Elias & Saucier, 2006). In reality, this distinction is frequently difficult to justify because many neuropsychologists routinely employ experimental techniques to address clinical questions.

Historical Trends

Crude neuropsychological interventions, including the surgical opening of human skulls for presumably therapeutic reasons, have been observed in skeletal remains dating back more than 7,000 years. Neuropsychological inquiry can be traced back to Greeks such as Hippocrates (circa 400 BC), who believed that the brain was responsible for intelligence. During the past 2,000 years, a variety of philosophers and scientists have contributed speculations as well as direct scientific evidence that the brain is crucially important in controlling cognitive, sensory, and motor behaviors. More recent pioneers of modern neuropsychology include scientists of the 18th and 19th centuries who debated the degree to which the brain, especially the cortex, functioned as a whole (a notion subsequently referred to as *equipotentiality*) as opposed to views advocating that the brain has specific regions, mediating distinct behavioral functions (e.g., sensory, motor, and speech cortical areas). This latter view has become known as the *localization hypothesis of brain function*. These scientists developed the lesion technique (i.e., observing behavioral changes, before and after the imposition of tissue damage to the brain) and the electrical stimulation technique (i.e., observing the effects of electrically stimulating brain tissue to simulate the normal activity of the targeted brain regions) to more systematically study functions of the brain. The mid-20th century witnessed attempts to develop neuropsychological tests and test batteries that would be useful in helping neurologists and neurosurgeons in locating a variety of brain lesions. With the advent of modern neuro-imaging techniques such as computerized axial tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET), the focus of interest has shifted to include assessing normal cognitive function as well as evaluating changes in cognition related to a variety of treatment modalities (Elias & Saucier, 2006).

In the past 3 decades, neuropsychology has matured from a relatively arcane offshoot of clinical and experimental psychology to a full-fledged academic discipline (Groth-Marnat, 2000). The growing interest in issues addressed by neuropsychologists can be appreciated by the recent dramatic increase in scientific publications containing the terms *neuropsychology* and *neuropsychological assessment*. From the 5-year period of 1976–1980 to the period of 2001–2005, there has been a 17-fold increase in articles that include neuropsychology and a 36-fold increase in articles that include neuropsychological assessment.

Training Opportunities

Although the majority of doctoral training programs in neuropsychology are embedded in clinical psychology programs, a number of graduate programs now specialize in doctoral training in neuropsychology. The *American Psychological Association* (APA), Division 40, lists roughly 40 doctoral programs offering training in neuropsychology in the United States and Canada. A number of other organizations, including the American Board of Professional Neuropsychology, American Board of Clinical Neuropsychology, American Academy of Clinical Neuropsychology, National Academy of Neuropsychology, and International Neuropsychological Association, provide useful information about the profession.

Clinical Assessment

The use of standardized tests that determine limits of normal function for appropriate reference groups (e.g., test performance that is adjusted for age, gender, level of education) has enabled neuropsychologists to gauge the presence and magnitude of abnormal function. As with other psychological test instruments, neuropsychological assessments should demonstrate acceptable levels of test reliability and validity, and provide adequate descriptions of test administration and scoring procedures. Furthermore, neuropsychologists strive to optimize each subject's test performance by creating a comfortable and nonthreatening test environment and ensuring that findings of complex cognitive dysfunction are not the result of more rudimentary sensory or motor disabilities.

Geriatric Neuropsychologists

Neuropsychologists often gain expertise and specialize in studying specific disease processes (e.g., affective disorder, schizophrenia, Alzheimer's disease) or developmental periods, from earliest childhood through advanced age. Recent work in early development has placed emphasis on the assessment of children with learning disorders. A large number of neuropsychologists are engaged in the study of normal and pathological aging. Their work often examines normal cognitive and behavioral change across the decades as well as impairments from disorders common in geriatric populations, including dementia, delirium, and depression. Both cross-sectional and longitudinal designs are employed in these investigations. For example, neuropsychologists working with neurologists and other scientists have found that modest declines in performance on neuropsychological tests assessing delayed recall correlate well with mild degrees of atrophy in the medial temporal lobe (i.e., an area implicated in the mediation of memory), as assessed on MRI scans, among cognitively normal functioning healthy elderly (Golomb et al., 1994). The degree of atrophy in this region also predicts subsequent decline in memory (Golomb et al., 1996). Geriatric neuropsychologists have contributed significantly to the classification of mild cognitive impairment (MCI), the probable harbinger of Alzheimer's disease, and other dementias (Golomb, Kluger, & Ferris, 2004). Neuropsychologists often design and assess tests of cognitive function that are sensitive to the possible effects of novel pharmacologic agents in clinical treatment trials of MCI, dementia, and depression.

As the field of geriatric neuropsychology continues to evolve, significant advances will be made in understanding brain changes related to normal and abnormal aging. One interesting trend is combining neuropsychological test scores with neuro-imaging, biochemical, and genetic measures to improve the early detection of dementia and the prediction of future decline to dementia among nondemented elderly.

Alan Kluger
James Golomb

See also
Neuropsychological Assessment

Internet Resources
American Academy of Clinical Neuropsychology
http://www.theaacn.org/

American Psychological Association Division 40
http://www.div40.org/

American Psychological Society
http://www.psychology.org.au/psych/special_areas/2.4_2.asp

Neuropsychology Central
http://www.neuropsychologycentral.com/

REFERENCES

Elias, J. E., & Saucier, D. M. (2006). *Neuropsychology: Clinical and experimental foundations*. Boston: Allyn and Bacon.

Golomb, J., Kluger, A., de Leon, M., Ferris, S., Convit, A., Mittelman, M., et al. (1994). Hippocampal formation size in normal human aging: A correlate of delayed secondary memory performance. *Learning and Memory*, *1*, 45–54.

Golomb, J., Kluger, A., de Leon, M. J., Ferris, S. H., Mittelman, M., Cohen, J., et al. (1996). Hippocampal formation size predicts declining memory performance in normal aging. *Neurology*, *47*, 810–813.

Golomb, J., Kluger, A., & Ferris, S. H. (2004). Mild cognitive impairment: Historical development and summary of research. *Dialogues in Clinical Neuroscience*, *6*, 351–367.

Groth-Marnat, G. (2000). Introduction to neuropsychological assessment. In G. Groth-Marnat (Ed.). *Neuropsychological Assessment in Clinical Practice* (pp. 3–25). New York: John Wiley & Sons.

NURSE COMPETENCE IN AGING

Nurse Competence in Aging (NCA) is improving the quality of health care older adults receive by enhancing the geriatric competence—the knowledge, skills, and attitudes—of 400,000 nurses who are members of approximately 57 specialty nursing associations. Nurse Competence in Aging is:

- Enhancing geriatric activities of national specialty nursing associations that apply for grant funding and receive technical assistance to move forward with geriatric best practice initiatives. Funded associations are designated American Nurses Association—Specialty Nursing Association Partners in Geriatrics (ANA-SNAPGs)
- Promoting Gerontological Nursing Certification to encourage specialty nurses to obtain dual certification and validate their geriatric competence along with their specialty expertise. Scholarships available!
- Providing a Web-based Comprehensive Geriatric Nursing Resource Center. GeroNurse*Online*.org is a comprehensive Web site providing current best practice information on care of older adults.

Nurse Competence in Aging is a 5-year initiative funded by The Atlantic Philanthropies (USA), Inc., and represents a strategic alliance among ANA, the American Nurses Credentialing Center (ANCC), and the John A. Hartford Foundation Institute for Geriatric Nursing, New York University College of Nursing.

EDITORIAL STAFF

Internet Resource

Nurse Competence in Aging
http://www.hartfordign.org/

NURSING HOME ADMISSION

The ageing of the population across the world is increasing and longer life expectancy means that the number of people aged 80 years and older will double during the next 2 decades and triple during the next 50 years (Aiden, 2003; Pearson & Nay, 2004). These “frail aged,” although mostly wishing to continue living in their own homes, face increased risks and impose considerable burdens on caregivers, families, and communities, prompting the need for admission to nursing homes and other forms of residential accommodation (Graham, Anderson, & Newcomer, 2005).

In advanced economies, admission to a nursing home is a significant event in the lives of older people. Placement of a relative in a nursing home is generally frowned on by society; home care is viewed as best and nursing home care as a last resort (Gaugler, Pearlin, Leitsch, & Davey, 2001). The decision to place a relative in a nursing home often occurs after a long and stressful period of home care. For many older people with declining health, nursing homes are equipped to offer better care than the home environment (Aiden, 2003; Pearson et al., 1998). To qualify for nursing home admission, a person must require continuous nursing care or be chronically ill but not so sick as to require hospital care. It is of some concern, therefore, that cultural perceptions undermine the critical social value of nursing homes (Davies, 2005).

An extensive body of literature describes the prevalence of caregiver stress in the community; a growing amount of literature is specifically concerned with caregiver stress as it relates to nursing homes. Increasingly, caregivers are themselves elderly. Several studies indicate that caring has different meanings and results in different responses in elderly caregivers, especially spouses, as compared with younger ones. Wenger (1990) suggests that for a spouse, caring is associated with intimacy, companionship, and reciprocity. When relationships are seen to be enduring and rewarding, attitudes toward care are more positive. Elderly people were found to be less inclined to complain or to seek help and more likely to sustain a caring role despite the severe incapacity of the care recipient and greater physical stress for the caregiver (Wenger, 1990). In cases in which the caregiver was younger, such as an adult child, caring intruded more into the caregiver's primary relationships and was viewed as more stressful, isolating, and constraining.

Relocation and Its Effect on Caregivers

It is generally assumed that nursing-home admission, by eliminating the need for 24-hour care, would result in reduced caregiver stress. Evidence to date does not support this expectation. Most studies suggest that the transition and postplacement period is a major life stressor associated with guilt, anger, despair, resentment, and general psychological distress.

The transition from home to nursing home can be made less traumatic by promoting an understanding of relocation as just another phase in the normal lifecycle of the family. Nursing-home entry can then be reconceptualized as a process rather than as a single life event (Davies, 2005). Participation in simple rituals that say good-bye to old contexts and assist in the acceptance of the new living environment can prepare families for the relocation.

Nursing-Home Staff and Relatives

Nursing-home staff have to be aware of relatives' needs so that they can work together to reduce the stress of nursing-home admission. The admission process usually focuses entirely on the needs of the resident, to the extent that nursing-home staff largely ignore the difficulties and stress that relatives experience. Caregivers often become the "hidden clients" of nursing homes (Duncan & Morgan, 1994).

Relatives' guilt and grief are often manifested as anger directed at nursing-home staff. Other attitudinal barriers can obstruct good communication between relatives and nursing-home staff. One such barrier is the commonly held view that families cease to be interested in their relatives once they are placed in nursing-home care. Yet, studies consistently show that, in most instances, relatives continue to care for the nursing-home resident, and although their role as caregiver is transformed, many relatives emphasize the importance of their contribution in the nursing-home context. Preadmission meetings can mark the beginning of an ongoing relationship not only with the resident but also with the family and can help alleviate such communication and perception barriers.

In general, relatives' involvement with nursing-home residents can have positive outcomes for both relatives and residents. When caring is divided into technical and nontechnical tasks—with relatives being relegated the nontechnical tasks—studies show that relatives' competence in delivering nontechnical care is generally high and that this is an acceptable approach for nursing-home administrators who are concerned about avoiding litigation. Other studies suggest that a more useful approach is to explore the purpose of tasks and emphasize collaboration between staff and relatives rather than task division.

Understanding the Needs of Caregivers

An extensive study of the nursing-home admission process from the perspective of relatives and significant others by Pearson and colleagues (1998, 2004) observed that nursing-home admission generates complex reactions and that society's general view of nursing homes shapes these reactions. Their data showed that relatives and significant others experienced a range of responses and emotions, including feeling bewildered, left out, guilty, or alone, or they experienced a sense of panic, failure, sorrow, powerlessness, or remorse. Intervention in the early stages of admission can improve the outcomes for relatives, significant others, and the new resident.

Pearson and colleagues (1998) also examined societal views and "rules" about nursing-home admission identified in public discourses from diverse sources. Themes identified in the professional literature include the idea that "home is best" and that society has a filial responsibility to provide care for the elderly; women are generally the primary caregivers; caregiver stress must be reduced to prevent premature nursing-home admission; and nursing-home entry results in guilt and continued stress for caregivers. Themes identified in the general media include the following: the costs of a graying society must be curbed; filial responsibility is expected and must be encouraged by government support; those who can afford to pay their own way should be required to do so; the family home is highly valued and should not be taken from old people to pay for care; nursing homes are to be feared and avoided; and the frail aged must be cared for "at home." Themes in government publications include that the cost of aging must be curbed, managed, and privatized. Although the research identified few differences in the dominant rules among the three texts, the voices of informal caregivers, the recipients of care, and professional caregivers were missing from the dialogue.

Studies suggest that nursing-home admission, in many instances, shifts rather than eliminates the terms of caring and the reasons for continued stress. Categories of inquiry used to analyze caregiver stress are in most instances predetermined and, therefore, tend to prescribe and impose a rigid and fixed understanding of caregiver roles. Nursing-home admission requires a support program for relatives and significant others if the transition from home care to nursing-home care is to be successful.

ALAN PEARSON

See also

Caregiver Burden
Caregiving Relationships
Nursing Homes
Relocation Stress

Internet Resources

Joanna Briggs Institute, University of Adelaide
http://www.joannabriggs.edu.au

National Long-Term-Care Ombudsman Resource Center
http://www.ltcombudsman.org/ombpublic/251_1339_11934.cfm

Patient UK
http://www.patient.co.uk/showdoc/

REFERENCES

Aiden, L. (2003). Helping patients and families transition to nursing home care: Home care nurses are a valuable resource. *Home-Healthcare-Nurse*, *21*(8), 568.

Davies, S. (2005). Meleis's theory of nursing transitions and relatives' experiences of nursing home entry. *Journal of Advanced Nursing*, *52*(6), 658–671.

Duncan, M. T., & Morgan, D. L. (1994). Sharing the caring: Family caregivers' views of their relationships with nursing home staff. *The Gerontologist*, *34*(2), 235–244.

Gaugler, J. E., Pearlin, L. I., Leitsch, S. A., & Davey, A. (2001). Relinquishing in-home dementia care: Difficulties and perceived helpfulness during the nursing home transition. *American Journal of Alzheimer's Disease and Other Dementias*, *16*(1), 32–42.

Graham, C., Anderson, L., & Newcomer, R. (2005). Nursing home transition: Providing assistance to caregivers in transition programs. *Lippincott's-Case-Management*, *10*(2), 93–101.

Pearson, A., & Nay, R. (2004). Relatives' experience of nursing home admissions: Preliminary study. *Australasian Journal on Ageing*, *23*(2), 86–90.

Pearson, A., Nay, R., Taylor, B., Tucker, C., Angus, J., Griffith, V., et al. (1998). Relatives' experience of nursing home entry: Meaning, practice and discourse. Second Interim Report. Adelaide, Australia: The University of Adelaide Department of Clinical Nursing.

Wenger, G. C. (1990). Elderly carers: The need for appropriate intervention. *Ageing and Society*, *10*, 197–219.

NURSING-HOME MANAGED CARE

Background

In the early 1900s, managed care emerged in various settings across the country as prepaid medical care in which, for a set monthly premium, subscribers' health care needs were met by participating providers. These early managed-care programs were typically started by physicians who collected a monthly premium in exchange for care, but as the concept developed, so did the organizations' corporate structures (Tufts, 2006). The monthly premium arrangement proved cost-effective for the subscribers and alleviated the stress of financial burden resulting from illness. The financial risk of providing care shifted to the individual or Managed Care Organizations (MCOs) operating the program.

Throughout the 20th century, managed care became known by employers as a less expensive yet comprehensive and quality form of insurance to offer their employees. While managed care grew in this private environment, the publicly funded Medicare and Medicaid programs insured the indigent, frail, and elderly population in a traditional fee-for-service environment. These two public programs account for 40% of all health care spending (Mednonca, Riefberg, & Tanio, 2005). With increasing financial pressure on the Medicare and Medicaid programs beginning in the 1970s, the state and federal governments also looked to the privately operated managed-care system as a way to control the escalating health care costs. The success of MCOs in the private insurance market is now being tested in the public sector.

Nursing-Home Revenue

Nursing homes provide residents with services including medical care, room and board, and social activities. Some of these services are skilled, such as rehabilitation, and others are long-term, or custodial care. The reimbursement structure for these services is primarily two-pronged, as follows:

- Reimbursement for skilled services comes from Medicare, Medicare MCOs, and commercial insurances when specific eligibility criteria are met. Medicare reimburses nursing homes for these services at federally established Medicare reimbursement rates. Medicare MCOs and commercial insurances reimburse at negotiated rates established through a contractual agreement between the insurer and provider.
- Custodial services, such as room and board, are covered through Medicaid, Medicaid MCOs, and private payments. Medicaid and Medicaid MCOs typically reimburse at a state-defined daily rate. For private pay, the nursing homes typically charge what the market will bear.

The Medicare and Medicaid programs remain the dominant funding sources for nursing home care. In terms of overall payments, Medicare covers 10% to 15% of nursing-home residents, accounting for 16% of nursing-home revenue, and Medicaid covers 65% to 70% of nursing-home residents, accounting for 48% of nursing home revenue (CMS, 2003; Holz-Eakin, 2005). Estimated total Medicare expenditures for nursing-home care are estimated to be $15.72 billion, or 5.4% of the overall Medicare budget (Holz-Eakin, 2005). Estimated total Medicaid expenditures for nursing-home care are estimated to be $46.86 billion, or 15% of the Medicaid budget (American Health Care Association, 2005). Private payments and commercial insurance plans account for the remainder of nursing-home reimbursement.

Nursing-Home Managed Care

Nursing-home costs under both Medicare and Medicaid programs have increased significantly in recent decades. Overall, national nursing-home expenditures grew from $17.7 billion in 1980 to $85.1 billion in 1997, an average annual increase of 9.7%. With this increasing fiscal pressure, state and federal governments turned to managed-care programs to control the cost escalation related to nursing-home care.

Under managed care, the federal and state governments pay a monthly capitation to private MCOs, who in turn accept the financial risk for the health care services used by the consumers covered under the plans. The MCOs are then responsible for managing those services, within defined benefits. Under these arrangements, MCOs offer the federal and state governments a level of cost predictability.

Medicare Managed Care

Medicare managed care has been in existence since the 1970s and was expanded as a voluntary

Medicare option, called Medicare + Choice, with the Balanced Budget Act in 1997. The Medicare Modernization Act (2003) further expanded the Medicare managed care options, now called Medicare Advantage (MA) plans, and created Special Needs Plans (SNPs) for certain groups, including the institutionalized nursing-home population. These plans are a voluntary alternative to traditional Medicare fee-for-service and provide all of the traditional Medicare Parts A & B covered services. Most MA plans also offer a Part D drug benefit and additional supplemental benefits. The CMS oversees the MA plans. Of the 42 million individuals who receive their health benefits through the Medicare program, 12% are covered by private MCOs (Kaiser Family Foundation, 2005).

SNP plans are "intended to encourage more choices for certain populations by allowing organizations that specialize in the treatment of beneficiaries with particular needs to have MA contracts" (National Health Policy Forum Issue Brief, 2005). The concept is that the market will drive participating organizations to develop expertise and efficiencies in caring for special groups such as institutionalized elderly. SNPs can, for example, put greater emphasis on preventative and primary care services, thus reducing the expected rate of more costly hospitalizations. CMS approved 37 institutional SNPs in 2006 (National Health Policy Forum Issue Brief, 2005).

The SNPs, like other MA plans, receive a monthly, fully capitated, risk-adjusted premium that covers all contractually covered health care services. The risk-adjustment reimbursement formula results in higher payments for those with the most costly conditions. There is an additional allowance for the institutionalized status. Nursing homes must enter into a contractual relationship with the SNPs and other MA plans in order to be network providers and serve plan members.

Medicaid Managed Care

Medicaid Managed Care programs, like traditional Medicaid, are designed and maintained by states, with a combination of state and federal funding. The states oversee the programs. Medicaid MCOs receive an actuarially determined monthly payment to cover Medicaid services such as custodial nursing-home care. Nearly 69% of Medicaid beneficiaries receive services through Medicaid MCOs; however, the majority of those who receive long-term-care services are still funded through traditional fee-for-service programs (Saucier & Fox-Grage, 2005).

With the estimated annual cost of custodial nursing home care exceeding $64,240 for a semi-private room, (Thomas, 2005) more states are now planning and starting new managed care programs that specifically target the nursing home-eligible population. Current Medicaid Managed Long Term Care programs operate in Arizona, Florida, Massachusetts, Minnesota, New York, Texas, and Wisconsin. California, Hawaii, Maryland and Washington are also planning programs (Saucier & Fox-Grage, 2005). Current programs are either mandatory or voluntary. Mandatory programs direct that all eligible Medicaid beneficiaries join a managed care plan, whereas voluntary programs give it only as an option. In the states where the programs are mandatory, the MCOs achieve significant negotiating leverage with providers because they control such a significant portion of the potential Medicaid revenue. In mandatory and voluntary states, the providers have incentives to contract with MCOs based on market share. Government-cost predictability appears to be the main driver for program expansion.

Consumer Impact of Nursing-Home Managed Care

Nursing-home managed-care plans characteristically provide a richer selection of covered benefits for nursing-home residents when compared to traditional public plans. Managed-care plans also offer consumers reduced premiums and other out-of-pocket costs. In exchange for this, the enrollee must go through the MCOs provider network and preauthorization requirements to receive the benefits. Opponents of the privatization of public nursing-home funding programs believe that the closed networks of managed-care programs will result in restriction of provider choice and access to care. It is important that consumers understand any in- or out-of-network restrictions prior to joining a plan.

Evidence suggests that both Medicare and Medicaid managed-care plans improve quality outcomes for nursing-home residents (National Health Policy Forum Issue Brief, 2005). The federal government and state licensing authorities monitor quality, cost effectiveness, and enrollee satisfaction of MCOs through their contractual agreements. These organizations ensure that enrollees covered by Medicaid and Medicare MCOs are able to receive professional care that meets the set standards. In addition, MCOs may participate in a voluntary national accreditation program that requires them to meet certain standards.

Elizabeth M. Miller

See also

Medicaid
Medicare
Nursing Homes

Internet Resources

AARP
http://www.aarp.org

American Health Care Association
http://www.ahca.org/

Centers for Medicare and Medicaid Services
http://www.cms.hhs.gov/SpecialNeedsPlans/

http://www.cms.hhs.gov/MedicaidDataSourcesGenInfo/01_Overview.asp

The Kaiser Family Foundation
http://www.kff.org

National Health Policy Forum
http://www.nhpf.org

Tufts Managed Care Institute
http:// www.thci.org

U.S. House of Representatives
http://www.cbo.gov/

REFERENCES

American Health Care Association (2005). Available at: http://www.ahca.org/research/index.html

CMS (2003, May 20). Health care industry market update: Nursing facilities. Available at http://www.cms.hhs.gov

DeLaGarza, V. W., Andersen, R. E., Mach, J., & Bennett, R. G. (2001). Improving rates of advance directive discussions among managed care nursing home enrollees. *Journal of the American Medical Directors Association*, *2*(3), 105–109.

Holtz-Eakin, Douglas (2005). The cost and financing of long-term care services. Statement for the Subcommitttee on Health, Committee on Energy and Commerce, U.S. House of Representatives. Congressional Budget Office. Available at http://www.cbo.gov/ftpdocs/63xx/doc6316/04-27-LongTermCare_testimony.pdf

Hurley, R. E., & Retchin, S. M. (2006). Medicare and Medicaid managed care: A tale of two trajectories. *The American Journal of Managed Care*, *12*, 58–64.

Kaiser Family Foundation (2005). Available at http://www.kff.org/medicaid/managedcare.cfm

Kane, R. L., Flood, S., Bershadsky, B., & Keckhafer, G. (2004). Effect of an innovative medicare managed care program on the quality of care for nursing home residents. *Gerontologist*, *44*, 95–103.

Kane, R. L., Flood, S., Keckhafer, G., Bershadsky, B., & Lum, Y. S. (2002). Nursing home residents covered by Medicare risk contracts: Early findings from the EverCare evaluation project. *Journal of the American Geriatrics Society*, *50*(4), 19–27.

Mednonca, L., Riefberg, V., & Tanio, C. (2005). Intensive Care for Medicaid. *The McKinsey Quarterly.* Available at http://www.mckinseyquarterly.com/article_abstract_visitor.aspx?ar=1562.

National Health Policy Forum Issue Brief (2005). Available at http://www.nhpf.org/pdfs_ib/IB808_SNP_11-11-05.pdf

Saucier, P., & Fox-Grage, W. (2005, November). Medicaid managed long-term care. (Issue Brief Number 79). Washington, DC: AARP Public Policy Institute. Available at http://www.aarp.org/research/assistance/medicaid/inb108_mmltc.html

Schnelle, J. F., Ouslander, J. G., Buchanan, J., Zellman, G., Farley, D., Hirsch, S. H., et al. (1999). Objective and subjective measures of the quality of managed care in nursing homes. *Medical Care*, *37*(4), 375–383.

Thomas, T. (2005). The National Underwriter Company National Underwriter, Life & Health/Financial Services Edition. *MetLife's Mature Market Institute*, 10.

Tufts (2006). Available at http:// www.thci.org/downloads/BriefHist.pdf

NURSING HOME REFORM ACT

As part of the Omnibus Budget Reconciliation Act (OBRA) of 1987, Public Law No.100-203, Congress enacted the Nursing Home Quality Reform Act (codified at 42 United States Code §§ 1395i-3(a)-(h) and 1396r(a)-(h)). This Act contains many of the recommendations made in a 1986 Institute of Medicine report (Institute of Medicine, 1986) that Congress had directed the Department of Health and Human Services (DHHS) to commission. OBRA 87 amended the Social Security Act, Titles XVIII (Medicare) and XIX (Medicaid), to require substantial upgrading in nursing-home quality and enforcement. Passage of this act demonstrated the impatience of Congress and the courts with what they, and the public, perceived as ineffectual regulation of nursing homes by DHHS' Health Care Financing Administration (now the Centers for Medicare and Medicaid Services [CMS]).

Under the Nursing Home Reform Act, each nursing facility is required to "care for its residents in such a manner and in such an environment as will promote maintenance or enhancement of the quality of life of each resident" and to "provide services and activities to attain or maintain, for each resident, the highest practicable physical, mental and psychological well-being." For each admitted resident, a facility must collect information according to a defined Minimum Data Set (MDS), using a Resident Assessment Instrument (RAI), about an individual's physical, mental, and emotional condition. Using this information, facilities must develop and implement an individualized plan of care for each resident.

To implement this legislation, DHHS published a series of regulations that has been codified at 42 Code of Federal Regulations Part 483. Nursing homes must comply with very specific mandates set forth in these Requirements for Participation. These federal requirements for which nursing homes are surveyed concern (1) resident rights; (2) admission, transfer, and discharge rights; (3) resident behavior and facility practices; (4) quality of life; (5) resident assessment; (6) quality of care; (7) nursing services; (8) dietary services; (9) physician services; (10) rehabilitation services; (11) dental services; (12) pharmacy services; (13) infection control; (14) physical environment; (15) administration; (16) laboratory; and (17) other. There are more than 185 individual survey items within those 17 categories.

The federal government contracts with the states to assess, through its survey agencies (usually the state health department), whether nursing homes meet these standards through annual surveys and complaint investigations. The annual standard survey, which must be conducted on average every 12 months and no less than once every 15 months at each facility, entails teams of state surveyors arriving without prior notice and spending several days in a facility. Their purpose is to determine whether care and services meet the assessed needs of residents and whether a facility is in compliance with other regulatory requirements. Through its State Operations Manual (SOM) (containing Interpretive Guidelines and survey protocols), CMS establishes specific protocols, or investigative procedures, for state surveyors to use in conducting the surveys. In contrast, complaint investigations, also conducted by state surveyors but following the individual state's procedures (within certain federal guidelines and time frames), usually target a single alleged problem in response to a complaint filed against a facility by a resident, a resident's family or friends, or nursing-home employees. Quality-of-care problems identified during either standard surveys or complaint investigations are classified into 1 of 12 categories according to their scope (i.e., the number of residents potentially or actually affected) and their severity (i.e., extent of possible harm).

Addressing documented deficiencies is a shared federal–state responsibility. CMS is responsible for enforcement actions involving nursing homes with Medicare certification. The scope and severity of a deficiency determines the applicable enforcement action and whether it is optional or mandatory. Enforcement sanctions can involve, among other options: compelling corrective action plans; levying civil monetary fines; denying a facility new Medicare and Medicaid payments; mandating directed staff training on particular aspects of care; imposing a receivership arrangement to manage a facility; forcing the transfer of residents out of an offending facility; and, ultimately, decertifying a facility from (in other words, kicking it out of) participation in the Medicare and Medicaid programs altogether. Sanctions may be applied retroactively for the period since the last standard survey. CMS ordinarily accepts a state's recommendation for sanctions or other corrective actions but has the authority to modify those recommendations.

In addition to the Nursing Home Reform Act, there are other federal laws that regulate nursing homes in the United States, including the False Claims Act, 31 United States Code §§ 3729-3732; the Mail and Wire Fraud Acts, 18 United States Code §§ 1341 and 1343; the Americans With Disabilities Act (ADA), 42 United States Code §§ 12101-12213; and the Rehabilitation Act, 29 United States Code ß 794. In addition, the quality of care delivered to nursing-home residents is governed by state professional and institutional licensure statutes and regulations; standards of private accrediting bodies such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO); state elder abuse and neglect laws; private civil litigation for malpractice; and state legislative counterparts to the False Claims Act, ADA, and Rehabilitation Act.

Marshall B. Kapp

See also

Nursing Homes

Internet Resources

American Association of Homes and Services for the Aging
http://www.aahsa.org

American Health Care Association
http://www.ahca.org

American Health Lawyers Association
http://www.ahla.org

American Medical Directors Association
http://www.amda.com

Centers for Medicare and Medicaid Services, USDHHS
http://www.cms.hhs.gov/center/snf.asp

REFERENCES

Institute of Medicine (1986). *Improving the quality of care in nursing homes*. Washington, DC: National Academy Press.

NURSING HOMES

Nursing homes (NHs) care for an old, frail population and are devoting more resources to the care and treatment of persons needing short-term rehabilitation, continuous medical monitoring, persons with profound dementia/cognitively impaired and functional disabilities, and the terminally ill. Resident acuity has increased since the 1990s, with many nursing homes providing services and care previously provided only in acute care.

Facility Characteristics

In 1999, there were approximately 18,000 NHs with almost 1.9 million Medicare and/or Medicaid certified beds (NNHS, 2002). Almost 82% of all NHs are dually certified for both Medicare and Medicaid. NHs average 100 beds; 67% are for-profit, 27%, nonprofit; 6%, government and other. Approximately 70% of for-profit homes are group- or chain-affiliated,compared to 30% of nonprofit homes.

Despite a reduced bed supply relative to the aging population (e.g., 1991: 141 beds/1,000 75-year-olds; 1996: 117 beds/1,000 75-year-olds), occupancy rates continued to fall from 90% to 98% occupancy in 1993 to 85% to 89% occupancy in 1999 (NNHS, 2002). The decline is attributed to options involving home-care options and less restrictive environments such as assisted-living residences (Waidmann & Thomas, 2003). The increase from 6% of all older adults in NHs (1992–1996) to 7.7% in 1997–1998 might be explained by the fact that people are living longer; 45% of NH residents are 85 and older.

Risk Factors for Admission and Services Provided

Approximately 1.56 million people (slightly less than 6% of the elderly cohort) are in a NH on any given day, with 46% admitted from a hospital. Risk factors for admission are advanced age, medical diagnosis, living alone, loss of self-care ability, mental status, race, lack of informal supports, poverty, hospital admission, bed immobility, and female gender. Mentally ill, developmentally disabled, or mentally retarded individuals cannot be admitted to a NH unless the type or intensity of services needed can be provided.

Overall goals of care are to maintain or improve physical and mental function, eliminate or reduce pain and discomfort, offer social involvement and recreational activities in a safe environment, reduce unnecessary hospitalizations and emergency room use, and assure a dignified death. NHs must provide dental, podiatric, and medical-specialty consultation services; social services; and mental health and nutrition services. Some homes have fully equipped dental, podiatric, and X-ray suites, laboratory facilities, and pharmacies.

All NHs provide care at the end of life. Approximately 75% of NHs provide hospice care although this can vary from a consultative relationship with a certified hospice agency to one in which the resident's care is planned, managed, and monitored by the hospice agency in the NH. Residents receiving hospice services have better pain management, fewer hospitalizations, and less use of feeding tubes than residents receiving standard end-of-life care (Miller, Gozalo, & Mor., 2001).

Virtually all homes provide rehabilitative services (i.e., physical therapy, occupational therapy, speech, and hearing), but the intensity of the service varies with the home's program operation and Medicare participation.

Slightly more than 19% of NHs have formally designated Special Care Units (SCUs), constituting approximately 7% of all NH beds. These units care for residents with dementias and ventilator-dependent residents and provide skilled rehabilitation.

Resident Characteristics

Most NH residents are White (86%) and female (62%); 12% are under 65 years of age. The most frequent admission diagnoses are heart disease, hypertension, post-cerebral vascular event, and senile dementia. Of residents, 21% are hearing impaired and 27% are visually impaired. At least 60% of residents have some kind of communication problem. The number of residents needing assistance with activities of daily living (ADL) increased from 72% in 1987 to 95% in 1999 (NNHS, 2002). Almost 50% of residents are bowel and bladder incontinent.

Approximately 65% of NH residents have some degree of dementia; 20% of all residents have at least one symptom of clinical depression, particularly those age 65 to 84 years. The percentage of residents receiving psychoactive medication increased from 48% in 1998 to 63% in 2004 (Harrington, Carrillo, & Mercado-Scott, 2005). One-third of residents have inappropriate or dangerous behavior. The use of physical restraints decreased from 12.5% of residents in 1998 to 7.5% in 2004 and is attributed to increased regulatory oversight and staff education (Harrington et al., 2005).

One-quarter to one-half of NH residents are hospitalized annually, some as many as 4 times in 1 year. Influences on hospitalization decisions include physician practice pattern in the NH and local area, hospital vacancy rate, Medicare eligibility, staff and family pressure, NH resources (e.g., diagnostic services, IV therapy, insufficient RNs, systemic infectious processes, cost of antibiotic therapy, pulmonary disease, payment source, and advanced age). There appears to be a relationship between low NH Medicaid reimbursement rates and the greater likelihood of hospitalization.

Of all NH residents, 51% have some form of advance directive (including Do Not Rescusitate [DNR]); 66% of all residents die in the NH. An anticipated increase in Do-Not-Hospitalize (DNH) requests (currently, 4% to 6% of NH residents) and refusal of life-sustaining interventions will likely result in fewer hospitalizations and more "planned deaths" in nursing homes.

The average length of stay (LOS) for long-term residents is 2.5 years. Justification of continued-stay review, intensive rehabilitation, and aggressive outplacement to cheaper, lesser levels of care, such as assisted-living or home care, are resulting in shorter NHLOS. Increasingly, more residents are being discharged back to the community, "recovered or stabilized."

Staffing

Of the 1.5 million full-time equivalent (FTE) employees in NHs in 1999, almost two-thirds were nursing staff (i.e., RN, LPN, Certified Nurse Assistant [CNA]). Nursing staff turnover is pervasive, costly, and impacts negatively on quality of care. In some states, CNA turnover exceeds 100% annually. Turnover is associated with staffing levels lower than in comparable NHs, poor quality of care, larger facilities, and for-profit ownership (Castle & Engberg, 2006). The "interdisciplinary team" consisting of nursing and social services, activities, a dietitian, rehab therapist, and physician, are accountable for resident care and outcomes.

An RN must be on duty for at least 8 consecutive hours a day with licensed personnel (e.g., LPN) on duty to provide care 24/7. Total nursing-care hours per resident day increased from 3.1 hours in 1991 to 3.7 hours in 2004 (Harrington et al., 2005). On average, current staffing per resident day is RNs, 0.6 hour; LPNs, 0.7 hour; CNAs, 2.3 hours. Several studies found a positive relationship between RN staffing and quality outcomes.

Every resident must have a physician who is legally responsible for the plan of care. Few NH physicians are certified geriatricians. A full-time NH physician can have 60 to 80 residents. Every NH is required to have a medical director, on-site a minimum of 20 hours per week, with responsibilities that include quality improvement, patient services, resident rights, and administration (Office of Inspector General, 2003).

Twelve percent of NHs have no physical therapists; 20% have no occupational therapist; 26% have no speech/language therapist. The number of social workers, activity therapists, and nutritionists varies with facility size. Nursing-home administrators must be licensed and, in most states, have a bachelor's degree in long-term-care administration or a related (health) field.

Costs and Reimbursement

Approximately 62% of NH residents are dually eligible (Medicare/Medicaid) beneficiaries; 29.7% have Medicare only, and less than 5% have Medicaid only. The combined cost of NH care for Medicaid and Medicare was $86 billion in 1999 (Health Care Financing Review, 2001). The Medicare portion increased from $2 billion in 1990 to $18 billion in 1999. Medicaid is the primary payer for approximately 60% of NH residents. Private pay accounted for 44% of NH revenue in 1985 but only 28% in 1996 (25% of residents); private insurance, 3% to 4%; public/charity, 3%. Whereas at time of admission a dual-beneficiary resident is likely to be Medicare-covered, Medicaid is likely to cover the extended-stay non-Medicare portion of NH residence. The Medicare component of the NH program remains essentially restricted to 100 days of only post-hospital skilled nursing and/or skilled rehabilitation.

Implementation of a prospective payment system (PPS) for Medicare reimbursement in 1997 (Balanced Budget Act [BBA] P.L.105-33) placed NHs under increasing pressure to maximize revenue and reduce costs. Medicare no longer reimburses on a cost-based system but rather on a resident classification PPS that reflects the resource utilization of different patient types. At least 17 states are using some kind of case-mix reimbursement system that classifies residents into homogeneous resource utilization groups (RUGs) and links reimbursement to residents' characteristics and resource use. Almost two-thirds of Medicare-covered NH stays in 1999 were provided to residents in three of the five Rehab RUG-III groups and in the Extensive Care RUG-III Group (HCFR, 2001).

Quality of Care Monitoring

In 1987, nursing homes were subject to sweeping reforms contained in the Omnibus Budget Reconciliation Act of 1987 (OBRA '87) or Nursing Home Reform Law. Nursing homes have an unannounced survey every 9 to 15 months by a state's health department acting as agents for the Center for Medicare and Medicaid Services (CMS). There can be a "look-behind" survey by federal Medicare surveyors. The CMS Web site, NHCompare, provides NH-specific data that include 12 long-term and 3 short-stay quality measures and compare NHs within states and with national benchmarks. Review and accreditation by the Joint Commission on Accreditation of Healthcare Organizations is optional for all NHs but mandatory for hospital-based NHs and those seeking managed-care contracts or affiliations.

Quality-of-care and quality-of-life deficiencies are characterized by their scope (i.e., number of residents potentially or actually affected) and severity. The two most frequently cited deficiencies in 2004 were failure to ensure proper food sanitation (32% of all NHs) and failure to provide quality of care (26%). The top 10 deficiencies concerned accidents, resident dignity, pressure sores, and comprehensive care planning (Harrington et al., 2005). Pain management has improved significantly. Reduction in problems with quality, since 1999, might be attributable to inconsistencies in how states conduct surveys and understatement of serious deficiencies (Government Accountability Office, 2005).

Future Trends

At least 46% of the elderly population of the United States will spend some time in a NH. The potential for technology to improve quality of care and quality of life in NHs includes falls prevention (e.g., chair alarms, rehab equipment to improve strength), wandering management (i.e., low- or high-tech), incontinence care (e.g., voiding reminders), and passive call systems. Barriers to implementation include NHs lack of experience and skill in application of advanced technologies; absence of industry standards and applicable regulations regarding use of the technologies; and insufficient financing.

The notion of culture change, articulated by the Pioneer Movement in the late 1990s, has captured the attention of the NH industry as well as those who regulate it, set policy, and seek to improve quality of care and quality of life. Nursing homes are reinventing themselves so that resident dependency, in part a product of the institutional model, is less likely to occur and a model that supports resident growth and creativity—through person-centered care and staff empowerment—is created. Emerging best practices in nursing homes include mentoring programs, staff involvement (i.e., empowerment) in decision making, flexible work schedules, data-driven plan of care, family involvement, and a home-like environment that includes resident choices and input into facility operations (OIG, 2005).

ETHEL L. MITTY

See also

Advance Directives
Assisted Living
Dementia: Special Care Units
Nursing Home Admission
Nursing Home Managed Care
Nursing Home Reform Act

Internet Resources

American Association of Homes and Services for Aging
http://www.aahsa.org

American Health Care Association
http://www.ahca.org

National Center for Health Statistics
http://www.cdc.gov/nchs

NH Compare Web site
http://www.medicare.gov/NHCompare

Pioneer Network (Culture Change)
http://www.pioneernetwork.org

REFERENCES

Castle, N. G., & Engberg, J. (2006). Organizational characteristics associated with staff turnover in nursing homes. *Gerontologist*, *46*(1), 62–73.

Government Accountability Office (2005). Available at http://www.gao.gov/new.items/d07794t.pdf

Harrington, C., Carrillo, M. S., & Mercado-Scott, C. (2005). Nursing facilities, staffing, residents, and facility deficiencies, 1998 through 2004. Department of Social and Behavioral Sciences. San Francisco: University of California.

Health Care Financing Review (HCFR) (2001). *Medicare and Medicaid Statistical Supplement*. Baltimore, MD: U.S. Department of Health and Human Services, Health Care Financing Administration.

Miller, S. C., Gozalo, P., & Mor, V. (2001). Outcomes and utilization for hospice and non-hospice nursing facility residents. Available at http://www.aspe.hhs.gov/daltcp/reports/oututil.htm

Office of the Inspector General (OIG) (2003). National Medical Director Survey. USDHHS: OEI-06-99-00300.

Office of the Inspector General (OIG) (2005). Emerging Practices in Nursing Homes. USDHHS: OEI-01-04-00070.

National Nursing Home Survey (NNHS) (HCFR). 1999 Summary. National Center for Health Statistics. Hyattsville, MD: Centers for Disease Control and Prevention, USDHHS.

Waidmann, T. A., & Thomas, S. (2003). *Estimates of the risk of long-term care: Assisted living and nursing home facilities*. Report prepared for Office of Disability, Aging, and Long-Term-Care Policy, ASPE. Washington, DC: The Urban Institute.

NURSES IMPROVING CARE TO HEALTH SYSTEM ELDERS (NICHE)

Nurses Improving Care to Health System Elders (NICHE) is the only national nursing-led initiative focused on care of the hospitalized older adult. NICHE provides initial and ongoing resources to assist hospitals develop and strengthen both individual nurse's geriatric expertise and a hospital's capacity to develop, use, and evaluate best-practice nursing care for older adults (Fulmer et al., 2002). The NICHE "tool kit" includes nursing organizational models, a geriatric nursing core curriculum and other educational resources, a national listserv, evidence-based protocols, and program evaluation tools (Fulmer, et al., 2002; Mezey et al., 2004).

History of NICHE

NICHE is a program of the John A. Hartford Foundation Institute for Geriatric Nursing at New York University College of Nursing and was founded by Terry Fulmer and Mathy Mezey in 1992. NICHE is an outgrowth of the Hospital Outcomes Project (HOPE), funded by the John A. Hartford Foundation, which yielded models of nursing care designed to improve geriatric hospital care. The models were field-tested in four pilot hospitals that demonstrated an increase in nurses' perceptions of knowledge, positive attitudes, and improved practice environment around care of older adult patients (Fulmer et al., 2002; Mezey et al., 2004).

NICHE hospitals now comprise a national network of almost 200 members that are linked through a listserv, ongoing conferences, and task forces that inform policy and resource development at the New York University College of Nursing. The NICHE program includes the following:

- tools to implement geriatric evidence-based nursing practice in the hospital setting
- A leadership conference to provide education on adapting and implementing NICHE tools
- ongoing technical assistance for NICHE implementation, evaluation, and expansion

The Geriatric Institutional Assessment Profile

The Geriatric Institutional Assessment Profile (GIAP) is an instrument that helps NICHE-participating hospitals assess their institutional readiness to provide quality care to older adults prior to implementing NICHE (Abraham et al., 1999). The GIAP is meant to be used as a proxy measure for the overall quality of care provided to elderly patients and thus serve as a benchmarking tool to assist hospitals in identifying gaps in knowledge about geriatric care, attitudes and perceptions that influence how staff work with older patients, specific practice issues and concerns, and organizational attributes of the hospital relevant to geriatric care.

Organizational Models

The NICHE program provides hospitals with organizational planning tools and action plans, promotional supports, staff development resources, clinical practice protocols, and evaluation methods to develop one or more of following models.

Geriatric Resource Nurse Model

Unit-based geriatric resource nurses (GRNs) are functioning in 63% of NICHE hospitals, providing consultation to other staff on geriatric care issues (Mezey et al., 2004). After receiving specialized education in nursing care of the older adult, the GRNs receive ongoing mentorship and clinical support from advance practice nurses (Fulmer, 2001).

The ACE Unit Model

NICHE hospitals have implemented the Acute Care for Elders (ACE) model that was formally developed at University Hospitals of Cleveland in conjunction with the Frances Payne Bolton School of Nursing at Case Western Reserve University. ACE units provide centralized and focused expertise in a prepared environment. The program components include interdisciplinary protocols, patient- centered nursing care, early discharge planning, and geriatric medical care (Siegler, Glick, & Lee, 2002). ACE units also provide furniture, sitting areas, low beds, sensory aids (e.g., hearing amplifiers), equipment to support functional performance, and environmental design that is specialized to the needs of older adults (Fulmer et al., 2002; Mezey et al., 2004).

An advanced practice nurse provides consultation and education to improve nurses' accuracy and efficiency in detecting and managing delirium in hospitalized older adults.

Quality Cost Model of Transitional Care

This model targets older adults at high risk for poor postdischarge outcomes. Advanced practice nurses provide direct care and coordination of services to at-risk patients.

The NICHE Leadership Conference

The New York University College of Nursing (NYUCON) sponsors a 2-day NICHE Leadership Conference that provides hospital administrators and staff with the practical information and skills needed to implement and maintain a NICHE program that is customized to their unique hospital setting. The goal of the conference is to assist hospitals to effectively use the toolkit. Additionally, conference participants have the opportunity to share ideas and learn from mature hospital NICHE providers about how to improve geriatric practice.

Ongoing Technical Assistance From NICHE

NYUCON provides ongoing technical assistance for NICHE hospitals, including an annual Clinical Update Conference and User Conference that provide, respectively, the most current information on geriatric best practices and techniques to sustain and extend geriatric initiatives. NYUCON also offers NICHE sites the following:

- daily telephone availability to field questions from hospital staff
- the NICHE and John A. Hartford Institute for Geriatric Nursing Web site for information and resource sharing on geriatric issues

- analysis, benchmarking, and reporting of GIAP data
- the NICHE listserv that connects providers across North America
- regular conference calls to facilitate strengthening and expanding NICHE programs

NICHE Outcomes

Hospitals have reported improved clinical outcomes, enhanced nurse knowledge, increased compliance with protocol application, and decreased length of stay upon implementing the NICHE program (Fulmer et al., 2002; Mezey et al., 2004). Also, NICHE programs are associated with improved Joint Commission performance and magnet initiatives. NICHE sites describe the following key factors as instrumental in successfully implementing NICHE:

- A clear vision of geriatric care: NICHE requires internal evaluation of current geriatric practice and the institutional milieu and a vision for improvement
- Administrative and management support: NICHE requires leaders with expertise in geriatric care, strong leadership skills, and support to leverage resources
- Data-driven decision-making: NICHE requires measurement of initial, baseline data, and ongoing evaluation of clinical, financial, and organizational measures as well as patient/staff satisfaction
- Critical mass of support: NICHE requires the critical mass of support of both bedside nurses and middle- and high-level nurse managers
- Team education: interdisciplinary collaboration is essential to geriatric practice; thus, NICHE sites provide education on team principles and practice
- Attention to staff concerns: NICHE sites understand the need to include staff in relevant decision making and address staff needs for education, equipment, and other geriatric-specific resources
- Attention to external resources: NICHE sites integrate the political, economic, and social needs of their communities with their planning for the institution
- Dedicated time and resources: NICHE sites start with pilot programs and plan to implement incremental change

NICHE requires an organizational commitment. Ongoing designation as a NICHE hospital requires demonstration of an active geriatric model and ongoing evaluation of its effectiveness.

Marie Boltz

See also
Geriatric Resource Nurse
Hospital-Based Services

Internet Resources
John A. Hartford Foundation Institute for Geriatric Nursing
www.hartfordign.org

NICHE
www.hartfordign.org/programs/niche

Nurse Competence in Aging
www.geronurseonline.org

REFERENCES

Abraham, I. L., Bottrell, M. M., Dash, K. R., Fulmer, T., Mezey, M., O'Donnell, L., et al. (1999). Profiling care and benchmarking best practice in care of hospitalized elderly: The Geriatric Institutional Assessment Profile. *Nursing Clinics of North America*, *34*(1), 237–255.

Fulmer, T. (2001). The geriatric resource nurse: A model of caring for older patients. *American Journal of Nursing*, *102*, 62.

Fulmer, T., Mezey, M., Bottrell, M., Abraham, I., Sazant, J., Grossman, C., et al. (2002). Nurses Improving Care for Healthsystem Elders (NICHE): Nursing outcomes and benchmarks for evidence-based practice. *Geriatric Nursing*, *23* (3), 121–127.

Mezey, M., Kobayashi, M., Grossman, S., Firpo, A., Fulmer, T., & Mitty, E. (2004). Nurses Improving Care to Healthsystem Elders (NICHE): Implementation of Best Practice Models. *Journal of Nursing Administration*, *34* (10), 451–457.

Siegler, E., Glick, D., & Lee, J. (2002). Optimal staffing for acute care of the elderly (ACE) units. *Geriatric Nursing*, *23* (3), 152–155.

NUTRITIONISTS

A registered dietitian (RD) is the most common nutrition professional and is a designated member of the health care team responsible for nutrition care as defined by the Health Care Financing Administration's Joint Commission on Accreditation of Health Care Organizations. In 2006, there were 63,029 members of the American Dietetic Association (ADA), the primary organization for dietetic professionals (Moen, 2006).

Academic and Clinical Preparation of the RD

The Commission on Dietetic Registration (CDR) of the ADA confers the RD credential on an individual who meets specific academic and clinical requirements and passes a national registration examination.

An RD must have a minimum of a bachelor's degree from a university or college in the United States that is regionally accredited. The university's coursework must be accredited by the Commission on Accreditation for Dietetics Education (CADE) of the ADA. In 2005–2006, there were 229 academic programs accredited by CADE in the United States and Puerto Rico. Academic requirements include coursework in physiology, anatomy, biochemistry, the psychosocial sciences, management, and nutrition and food science. Courses must include information about assessment of nutritional status of the elderly; the age-related effects on metabolism, nutrition needs, and food choices; adaptive feeding techniques and alternative feeding modalities; nutrition counseling; and the effects of socioeconomic, cultural, and psychological factors on food and nutrition behavior. Courses are also required in economics, organizational management, large-volume feeding, and food-service management.

In addition to academic education, a minimum of 900 hours of supervised clinical practice in a CADE–accredited practice program must be completed. There are 312 of these programs in the United States and Puerto Rico. Experiences are planned to develop basic skills in nutritional assessment and management of food and nutritional needs for people across the life span. Supervised practice programs may include food and nutrition experiences in acute and ambulatory care settings, skilled nursing facilities, home-care programs, congregate feeding and home-delivered meal programs for the elderly, and other community programs. Following successful completion of the supervised clinical practice, the person is eligible to take the national registration examination and obtain the RD certification. In addition to national registration, 31 states have licensure statutes.

Other Nutrition Providers

A certified nutrition specialist (CNS) has a graduate degree in nutrition, has completed either 1,000 hours of supervised practice or 4,000 hours of unsupervised practice, and has passed a certification examination administered by the Certification Board for Nutrition Specialists. Requirements for academic and clinical preparation for this credential are not as specific, nor are the requirements for clinical preparation as rigorous, as those for a dietitian.

A dietetic technician, registered (DTR), provides support to the dietitian in all health care settings. The DTR credential is conferred by the CDR on a person who has successfully completed an associate of science degree or a bachelor's degree in dietetics, has specific clinical experience in a program accredited by CADE, and has passed a national registration examination. There are 57 DTR programs in the United States. The DTR works under the supervision of the RD and may provide the following services: screening for nutrition risk, intervention for patients with less complex nutrition problems, and preventive nutrition services.

A certified dietary manager (CDM) most commonly works in a skilled-nursing or long-term-care facility, under the supervision of an RD. In the absence of an RD, the CDM directs food and nutrition services. The CDM is trained in a certificate program, usually in a community college.

Advanced-Level Practice

In addition to establishing and enforcing standards for entry-level dietetic education, the CDR oversees the continuing professional education (CPE) of RDs. RDs must complete 75 hours of CPE every 5 years. Requirements for continuing education include a periodic self-assessment of learning needs and a plan to update needed knowledge and skills. The process includes professional self-reflection, learning needs assessment, and establishing a learning plan to meet one's professional goals. This continuing-education process stimulates dietitians to seek CPE that meets their specific professional goals. For example, a dietitian working with the geriatric population would establish a CPE goal related to geriatric nutrition and seek CPE opportunities that address this topic. Although almost 50% of the members of the ADA have master's or doctoral degrees, there is no specific advanced-level degree or credential in geriatric nutrition. There is, however, a dietetic practice group for gerontological nutritionists in ADA that has developed standards of practice for nutritionists working with older people (Shoaf, Bishirjian, & Schenkler, 1999). The standards relate to the provision of services, application of research, communication and application of knowledge, utilization and management of resources, and maintenance of competence in the area of geriatric nutrition. A newsletter that focuses on food and nutrition needs of the elderly is published by the practice group. The ADA has been an active advocate for the role of nutrition in maintaining health and good functional status in older people. Examples of position papers and educational resources can be found on the ADA Web site. In 2003, ADA identified aging as one of the organization's top two emerging issues. The Task Force on Aging published an extensive report in January 2004 describing ADA's program of work in aging, outlining a wide range of goals and activities related to dietitian education, alliances and advocacy, and existing and needed professional resources.

Role of Nutritionist in Health Care

The ADA maintains a database of its members (RDs and DTRs). Responses from a survey of 9,873 employed members (i.e., 89% RD, 11% DTR) indicated that 33% of RDs worked in acute-care hospitals, 11% in ambulatory settings, 11% in extended-care facilities, 9% in community and public health programs (including congregate feeding and home-delivered meals for the elderly), and 10% as consultants or in private practice (Rogers, 2006).

Older people are more likely to have chronic conditions and functional impairments that interfere with the maintenance of good nutritional status. Lack of attention to dietary intake and poor nutritional status can have a negative impact on many chronic diseases and contribute to declining health. There is consistent evidence that interventions for malnutrition or as therapy for chronic disease, particularly cardiovascular diseases, obesity, diabetes, renal failure, and osteoporosis, have positive effects on outcome and are cost-effective (Sheils, Rubin, & Stapleton, 1999).

The geriatric population is considered to be at high nutritional risk in most health care settings. There is concern that the incidence of malnutrition in the geriatric population is underreported (Sullivan & Lipschitz, 1997). The dietitian's role is to assess this nutritional risk, work with the health care team to plan interventions, and evaluate the outcome of care. Interventions may include individual or group counseling to prevent disease or reduce the effects and progression of disease, addressing food insecurity, recommending and providing modified diets, supplementing energy and nutrient intake, and recommending and monitoring nutrition support (enteral and parenteral). In some settings, particularly home care, the dietitian may develop nutrition education materials and educate other health professionals, such as nurses, and informal caregivers who provide direct care to patients.

There is little direct reimbursement by third-party payers for nutrition services at the present time. In the acute-care setting and in skilled-nursing facilities, dietitians' services are part of the daily patient costs, which also include other basic services such as nursing and food service. In home care, dietitians' services are required for patients at high nutrition risk, but there is no additional reimbursement for this service. In the ambulatory setting, few nutrition services are reimbursed and must be covered as part of administrative overhead. One exception is that beginning in 2002, Medicare Part B coverage was modified to include reimbursement for medical nutrition therapy for diabetes and renal disease (nondialysis) when the services are provided by an RD. Medicare reimbursement is also available for diabetes self-management and requires that an RD be part of the teaching team.

PATRICIA BOOTH

See also

Caloric Intake
Eating and Feeding Behaviors
Oral Health Assessment

Internet Resources

American Dietetic Association
http://www.eatright.org

American Society for Parenteral and Enteral Nutrition
http://www.nutritioncare.org

Consultant Dietitian in Health Care Facilities Practice Group
http://www.cdhcf.org

Dietary Managers Association
http://www.dmaonline.org/

Gerontological Nutritionists Practice Group
http://www.gndpg.org

National Resource Center on Nutrition, Physical Activity, and Aging
http://nutritionand aging.fiu.edu

Society for Nutrition Education
http://www.sne.org

REFERENCES

American Dietetic Association (2004). Improving nutrition for American seniors: A new look at the Older Americans Act. *Journal of the American Dietetic Association*, *105* (4), 527–529.

Moen, R. (2006). American Dietetic Association. *CEO Digest*, *5*.

Rogers, D. (2006). Dietetics Salaries on the Rise. *Journal of the American Dietetic Association*, *106*(2), 296–305.

Shiels, J. F., Rubin, R., & Stapleton, D. C. (1999). The estimated costs and savings of medical nutrition therapy: The medicare population. *Journal of the American Dietetic Association*, *99*(4), 428–435.

Shoaf, L.R., Bishirjian, K.O., & Schlenker, E.D. (1999). The Gerontological Nutritionists Standards of Professional Practice for dietetics professionals working with older adults. *Journal of the American Dietetic Association*, *99*(7), 863–867.

Sullivan, D., & Lipschitz, D. (1997). Evaluation and treatment of nutrition problems in older patients. *Clinics in Geriatric Medicine*, 13, 753–768.

O

OBESITY

Obesity, overweight, and their consequences have become major public health concerns in the United States, Canada, Europe, and most developed and a few developing countries (Expert Panel on the Identification, Evaluation and Treatment of Overweight in Adults [Expert Panel], 1998; Department of Health and Human Services, 2001; World Health Organization, 1998). *Prevalence rates of overweight and obesity* have escalated over the past 15 years worldwide and have reached epidemic proportions in the United States (Manson, Skerrett, Greenland, & VanItallie, 2004) The fundamental causes of the obesity epidemic are sedentary lifestyles and high-fat, energy-dense diets (Department of Health and Human Services, 2001; World Health Organization, 1998). In 2001, using self-reported height and weight, an estimated 58.4% of the U.S. adult population was overweight and 21.7% were obese, up from 45.7% and 12.7%, respectively in 1991 (MMWR). Rates of *obesity increase with age* from 36.5% in persons aged 18 to 24 years up to 65.4% in persons aged 55 to 64, declining to 50.6% in persons aged 75 and older (MMWR). Studies using measured height and weight provide higher *estimates of overweight*—64% overall, and 70% in persons aged 55 to 70 years (National Center of Health Statistics, 2004). Similarly, obesity rates increase with age, from 12.3% in young adults up to 25.5% in late middle-age, and down to 14.2% in the very old. Both overweight and obesity are most prevalent in non-Hispanic blacks and persons with lower income and less education.

Historically, criteria defining undesirable or unhealthy weight—overweight and obesity—were derived from studies on health risks and excess mortality conducted by the Metropolitan Life Insurance Company. The studies set a body mass index (BMI), calculated as weight in kilograms divided by height in meters squared (kg/m^2), as undesirable if greater than 27.2 for men and 26.9 for women. Current standards adopted by the World Health Organization (World Health Organization, 1998) and the U.S. Surgeon General and Public Health Service (Expert Panel, 1998; Department of Health and Human Services, 2001), define *healthy weight as a BMI* of 18.5 to 24.9, overweight as BMI 25.0 or greater, and obesity as BMI 30.0 or above, with extreme or class III obesity constituting a BMI of at least 40.0. Recognizing that relative weight does not reflect fat distribution, particularly in the abdominal region, *waist circumference* also has been utilized as an indicator of *excess adiposity*, with cut points of 102 cm (40 inches) for men and 88 cm (35 inches) for women used to define high-risk status (Expert Panel, 1998).

With growing prevalence, there has been increased recognition of *obesity-related health risks*, which include hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea and respiratory problems, and endometrial, breast, prostate, and colon cancers (Inelmen, Sergi, Coin, Miotto, Peruzza, & Enzi, 2003; Patterson, Frank, Kristal, & White, 2004; Department of Health and Human Services, 2001). Higher body weight is also associated with substantial limitations in physical functioning and increased disability in older persons (Ferraro, Ya-Ping, Gretebeck, Black, & Badylak, 2002; Inelmen, Sergi, Coin, Miotto, Peruzza, & Enzi, 2003) and greater all-cause mortality across the age spectrum (Expert Panel, 1998; Manson, Skerrett, Greenland, & VanItallie, 2004). Evidence linking *obesity to cognitive impairment* and dementia independent of associated vascular disease risk factors (e.g., hypertension, type 2 diabetes) has begun to emerge as well (Elias, Elias, Sullivan, Wolf, & D'Agostino, 2003; Gustafson, Rothenberg, Blennow, Steen, & Skoog, 2003).

The relationship between *overweight and obesity and health outcomes*, including mortality in older adults and particularly the oldest old, is complex. Two age-associated factors account for much of the difficulty in understanding the impact of excess weight and adiposity in old age. First, since weight loss frequently occurs in response to disease processes, weight in old age may not accurately reflect lifelong obesity status. That is, persons with low to normal weight in old age comprise those who have maintained a healthful weight throughout their lives and those who have lost weight from severe debilitating illness. Second, older adults typically experience loss of *appendicular lean mass*, or *sarcopenia*, and increased deposition of *fat in the abdominal region*. This alteration in body composition, which has known weight-related health consequences, may not be apparent from measures of relative weight (Department of Health and Human Services, 2001). In other words, normal-weight older persons may have unhealthy levels of adiposity and an undesirable weight distribution. For this reason, some suggest further consideration of appropriate measures of obesity in older adults (Kennedy, Chokkalingham, & Srinivasan, 2004).

In general, older persons who remain weight-stable—that is, who do not experience illness-related weight loss—exhibit the best health profile. Nevertheless, within weight-stable older adults, overweight and obesity confer similar risks of cardiovascular disease and associated conditions as observed in the general population.

Although the need to develop effective preventative and treatment programs for overweight and obesity for both children and adults has been promoted worldwide (Expert Panel, 1998; World Health Organization, 1998) and the efficacy of weight loss has been established for key cardiovascular disease risk factors, including hypertension, hyperlipidemia, and type 2 diabetes (Department of Health and Human Services, 2001; Manson et al., 2004), the issues of whether and how to treat *obesity in older adults* remain controversial. Many studies have found increased mortality associated with weight loss in older adults, thus the merits and safety of weight reduction has been questioned. In consideration of the potential hazards of weight loss in the elderly, the *Expert Panel* (1998) issued the following statement regarding weight loss in older adults:

> A clinical decision to forego obesity treatment in older adults should be guided by an evaluation of the potential benefits of weight reduction for day-to-day functioning and reduction of the risk of future cardiovascular events, as well as the patient's motivation for weight reduction. Care must be taken to ensure that any weight reduction program minimizes the likelihood of adverse effects on bone health or other aspects of nutritional status.

Alternatively, a recent review of obesity in older adults focused attention on energy use and recommends increased physical activity, particularly progressive resistance training as an effective approach to combat excess adiposity and preserve muscle mass and strength (Kennedy, Chokkalingham, & Srinivasan, 2004).

Overweight and obesity constitute a major and growing threat to the health and functioning of older persons worldwide, as many manifestations of excess energy intake and inadequate energy expenditure begin to emerge in early to late old age. Improved identification of older persons at risk and the development of safe and effective treatments that combine dietary modification and activity promotion appear to be key antidotes to the obesity epidemic.

ELEANOR M. SIMONSICK

See also

Diabetes

REFERENCES

Elias, M. F., Elias, P. K., Sullivan, L. M., Wolf, P. A., & D'Agostino, R. B. (2003). Lower cognitive function in the presence of obesity and hypertension: The Framingham heart study. *International Journal of Obesity*, *27*, 260–268.

Expert Panel on the Identification, Evaluation and Treatment of Overweight in Adults. (1998). *Clinical guidelines on the identification, evaluation, and* *treatment of overweight and obesity in adults.* Bethesda, MD: National Heart, Lung, and Blood Institute.

Ferraro, K. F., Ya-Ping, S., Gretebeck, R. J., Black, D. R., & Badylak, S. F. (2002). Body mass index and disability in adulthood: A 20-year panel study. *American Journal of Public Health*, *92*, 834–840.

Gustafson, D., Rothenberg, E., Blennow, K., Steen, B., & Skoog, I. (2003). An 18-year follow-up of overweight and risk of Alzheimer disease. *Archives of Internal Medicine*, *163*, 1524–1528.

Inelmen, E. M., Sergi, G., Coin, A., Miotto, F., Peruzza, S., & Enzi, G. (2003). Can obesity be a risk factor in elderly people? Obesity Reviews, *4*, 147–155.

Kennedy, R. L., Chokkalingham, K., & Srinivasan, R. (2004). Obesity in the elderly: Who should be treating and why, and how? *Current Opinion in Clinical Nutrition and Metabolic Care*, *7*, 3–9.

Manson, J. E., Skerrett, P. J., Greenland, P., & VanItallie, T. B. (2004). The escalating pandemics of obesity and sedentary lifestyle. *Archives of Internal Medicine*, *164*, 249–258.

National Center of Health Statistics. (2004). *Prevalence of overweight and obesity among adults: United States, 1999–2000.* Centers for Disease Control and Prevention.

Patterson, R. E., Frank, L. L., Kristal, A. R., & White, E. A. (2004). Comprehensive examination of health conditions associated with obesity in older adults. *American Journal of Preventative Medicine*, *27*, 385–390.

U.S. Department of Health and Human Services. (2001). *The Surgeon General's call to action to prevent and decrease overweight and obesity*. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General.

World Health Organization. (1998). *Report of a WHO consultation on obesity. Obesity: Preventing and managing the global epidemic*. Geneva: World Health Organization.

OCCUPATIONAL THERAPISTS

Occupational therapists (OTs)provide skilled services to facilitate engagement in meaningful occupations and return to maximal level of functional independence. Occupations are defined as "everything people do to occupy themselves including looking after themselves . . . enjoying lives . . . and contributing to the social and economic fabric of their communities" (Law, Polatajko, Baptiste, & Townsend, 1997, p. 32). Participation in occupation supports health. Research has demonstrated that older adults who participate in occupation-based programs, as compared to simply social programs or no activity, have fewer hospital visits, less pain, higher life satisfaction, and better general health and physical function (Clark et al., 1997).

Domain of Practice

The focus of occupational-herapy intervention is the "engagement in occupation to support participation in context" (American Occupational Therapy Association [AOTA], 2002, p. 611). Context includes not only the physical environment but also the cultural and social , personal, spiritual, temporal, and virtual contexts. OTs address performance areas of activities of daily living (ADL), instrumental activities of daily living (IADL), education, work, play, leisure, and social participation (AOTA, 2002). To assist older adults to return to their preferred *performance areas,* OTs may address motor skills, process skills, or communication/interaction skills while embedding these skills in the return or development of functional habits, routines, and roles. Performance areas include ADL (e.g., bathing, dressing, eating), IADL (e.g., meal preparation, medication management, community mobility), education, work/retirement, leisure, and social participation. For full participation, the client may need to work on motor skills such as posture, coordination, or strength; process skills such as problem solving, organization, adaptation, or attention; and communication/interaction skills such as orientation or verbal expression.

Intervention Approaches

OTs focus their interventions using different approaches designed to meet the needs of the client. The four primary approaches include (1) remediation or restoration of previously acquired skill or one that is developmentally appropriate; (2) compensation or adaptation to either compensate for loss or adapt the environment for participation; (3) disability prevention to address risks for loss of function; and (4) health promotion to provide enriched occupational experiences in context (AOTA, 2002).

Restoration of skills may follow a cerebral vascular accident (CVA). As a result of a CVA, a client may have physical limitations in upper-extremity strength and sensation. The client may also have cognitive impairments that affect problem solving and may experience situational depression due to the impact of the CVA on his or her abilities. The OT addresses range of motion, strength, and coordination in preparation for the functional performance needed to engage in everyday tasks. As part of therapy, the OT identifies the client's cognitive deficits and identify compensatory strategies needed for safety in the home and community. For example, an OT may use a cooking task as a modality to address the client's strength and problem-solving ability, with the end goal being return to independence in meal preparation. Engagement in occupation is both the means and the ends of therapy.

An important concern for many older adults is to remain living in their own homes. OTs engage the homeowner in an assessment that evaluates how the person(s) lives in his or her home and make recommendations on home modifications based on the person's current and predicted functional performance. Examples of home modifications include changing faucets to levers, doorknobs to lever handles, adding grab bars and shower chairs, adding ramps, moving the washer/dryer to main level of home, changing lighting in the home, and adding nonskid stair treads. Programs run by OTs address prevention by addressing risk factors that could lead to impairment. For example, falls can lead to significant loss of function, independence, or life. OTs address balance, flexibility, vision, and personal efficacy through individualized or group treatment such as the *Range of Motion Dance* (Harlowe & Yu, 1997) or *Matter of Balance* programs (Tennstedt, Peterson, Howland, & Lachman, 1998).

A foundation of occupational therapy is activity analysis. In analyzing tasks and activities, OTs address the person–environment–occupation fit. OTs break down the tasks to determine the required motor, process, and interaction skills required for successful completion of the task. Additionally, the OT addresses the skills and abilities of the person engaged in the task. How do the activity demands meet the abilities of the person? How does the environment and context support the task performance? These questions lead the OT to modify either the task or the environment or address remediation of skill in the client. Goals are collaborative in nature and are driven by the client's desire to return to or acquire skill in occupations.

Conditions and Disabilities Served by Occupational Therapists in Varied Settings

OTs work with clients throughout the life span. With older adults, OTs are aware of the co-morbidities that often accompany any new illness or disability. OTs may work with older adults in institutional settings such as hospitals, skilled-nursing facilities, hospice programs, and community-based programs such as day care programs, home care, and wellness centers. In institutional settings, OTs work with clients with neurological, cardiac, and orthopedic impairments or other medical conditions, such as brain injuries, CVAs, cancer, cardiac conditions, joint replacements, arthritis, dementias, and depression. Special areas of practice include falls prevention, home modification, low vision, driver assessment and rehabilitation, and retirement transition. Because OTs are trained in the physical, biological, and psychological sciences, they are well suited to meeting the holistic needs of an aging population.

Education and Training

OTs may have a bachelor's, master's, or doctoral (i.e., OTD) degree to practice. To practice in the United States, OTs must graduate from a school accredited by the American Council on Occupational Therapy Education (ACOTE) and receive initial certification from the National Board for Certification in Occupational Therapy (NBCOT). As of 2007, all entering practioners need a master's degree to be eligible for the national certification. Most states also require additional state licensure or certification to demonstrate continuing competence.

NORALYN DAVEL PICKENS

See also

Driving
Occupational Therapy Assessment and Evaluation
Physical Therapists
Rehabilitation
Speech-Language Pathologists

Internet Resources

The American Occupational Therapy Association (AOTA)
www.aota.org

The American Occupational Therapy Foundation (AOTF)
www.aotf.org

The Canadian Association of Occupational Therapists
www.caot.ca

REFERENCES

American Occupational Therapy Association (2002). Occupational therapy practice framework: Domain and process. *American Journal of Occupational Therapy*, *56*, 609–639.

Clark, F., Azen, S., Zemke, R., Jackson, J., Carlson, M., Mandel D., et al. (1997). Occupational therapy for independent-living older adults: A randomized controlled trial. *Journal of the American Medical Association*, *278*(16), 1321–1326.

Harlowe, D., & Yu, P. B. (1997). *ROM dance: A range of motion exercise and relaxation program.* Madison, WI: Uncharted Country Publishing.

Law, M., Polatajko, H., Baptiste, W., & Townsend, E. (1997). Core concepts of occupational therapy. In E. Townsend (Ed.), *Enabling occupation: An occupational therapy perspective* (pp. 29–56). Ottawa, ON: Canadian Association of Occupational Therapists.

Tennstedt, S., Peterson, E., Howland, J., & Lachman, M. (1998). *A matter of balance: Managing concerns about falls.* Boston University Royal Center Consortium.

OCCUPATIONAL THERAPY ASSESSMENT AND EVALUATION

Occupational therapists (OTs) have a distinct role in determining a client's functional diagnosis, including the causes of dysfunction and dependency. An essential component of the evaluation, the functional diagnosis, ascertains the individual's capacity to perform required and valued activities of everyday living (i.e., self-care, instrumental activities of daily living [IADL], work, leisure, education, and social) that support participation at home and in the community. The desired outcome of occupational therapy is to enable clients to engage meaningfully and effectively in their life roles and associated tasks, described by the profession as occupations. When feasible, OTs assist older adults to "age in place." If supportive living environments such as assisted-living or skilled-nursing facilities are required, then OTs work to enhance individuals' dignity and function by identifying their needs, interests, capacities, and limitations and foster coping strategies that promote adjustment and optimal participation.

In occupational therapy, clinical assessment uses specific measures or instruments to measure domains of function. Evaluation is the process of obtaining and interpreting data necessary for intervention. The OT's contribution to the plan of care is to clarify the client's performance strengths and deficits. Identifying the interrelationship of five domains of practice—(1) performance skills (e.g., mobility, coordination, effort tolerance, adaptive capacities), (2) performance patterns (e.g., roles, habits, routines), (3) contexts (e.g., physical environment, social supports), (4) demands of the activity (e.g., objects needed, time and movement required, social expectations), and (5) client factors (e.g., mental functions, physical abilities, sensory capacities)—can determine where and how an OT and other members of the health care team can competently intervene to maximize safe, satisfying participation at home and in the community.

The OT often begins the evaluation with the "Occupational Profile" (AOTA Commission on

Practice, 2002). This process involves ascertaining the client's occupational history, interests, values, and patterns of daily living before and after sustaining an illness, injury, or disability and current concerns about resuming meaningful roles and activities. While observing tasks of everyday living, OTs work with clients to restore, remediate, or compensate for barriers to participation.

Repeat assessments of actual performance are valuable for (1) verifying differential diagnoses, (2) monitoring progress, and (3) identifying the effects of multidisciplinary interventions on function. Three examples follow:

(1) Observing actual performance, such as in a "Kitchen Task Assessment" (KTA), can demonstrate discrepancies in concentration, motor planning, sequencing, and task completion. These differences, along with other supporting data, differentiate between cognitive impairment that stems from depression (i.e., depressive pseudodementa) or an early degenerative dementia Frequently, older adults with a mild-moderate dementia repeat the same mistakes when given a task to perform, whereas those individuals with depression and accompanying cognitive symptoms are more likely to make different mistakes. Team goals and interventions vary greatly with this diagnostic distinction.

(2) OTs notify physicians if they suspect that deterioration of daily function connotes the need to taper or change a medication that is causing adverse side effects.

(3) When the OT discovers that a client's fear of falling and subsequent social isolation are caused, in part, by the client's daughter communicating to her mother that it is too dangerous outside, the OT assesses the real and perceived fall risk with the client and then problem-solves with the interdisciplinary team, including the client and family.

Dysfunction and barriers to participation in the roles and tasks of daily living in older adults have many causes; thus, a comprehensive evaluation of relevant biopsychosocial factors is indicated. The following case study illustrates an evaluation performed by an OT.

Case Study: Mr. Frank

This 73-year-old male client sustained a left cerebrovascular accident (CVA) with a residual right hemiparesis 3 weeks ago; 5 years ago, he had a myocardial infarction. Transfer from a neurology service to a skilled-nursing facility and referral for occupational therapy occurred within the last week.

Functional Status

Mr. Frank walks independently without assistive devices, demonstrating a slow, unsteady gait and a stooped posture. He is unshaven and his hair is uncombed. His right dominant affected upper extremity has one-quarter to one-half active range of motion throughout the limb, and he is presently unable to perform bilateral motor tasks effectively. He needs minimal to moderate physical assistance with most self-care activities.

Clinical Complaints

Mr. Frank states that he has no appetite and that he knows that OT can't help him. "I built my own house, and look at me," he states. He complains of right shoulder pain and was observed pounding his fist when he unsuccessfully tried to use the telephone. "I couldn't even remember my own number and, to make things worse, I fell out of bed last night," he exclaimed.

Social History

Mr. Frank has a 64-year-old woman but no children. They have stated that their greatest pleasure is taking weekend trips to a country home that Mr. Frank built 12 years ago. He retired 5 years ago from a successful contracting business. Until this recent CVA, Mr. Frank did some consulting for his previous business, met retired friends for lunch and golf, and spent a lot of his time making and fixing things.

Initial Occupational Therapy Interview and Examination of Mr. Frank

After an initial conversation about Mr. Frank's feelings and concerns about the barriers to engaging in his needed and desired occupations, Mr. Frank reveals that he has pain in his right shoulder. The OT assessment reveals that the right shoulder is painful because of a subluxation (i.e., a partial dislocation). The OT then demonstrates to Mr. Frank how to reduce pain while walking and sitting. As part of the cognitive assessment, the OT asks Mr. Frank to sit and walk using the new methods demonstrated. Can he retain instructions? Do instructions need to be broken down into one or two steps? How often do the instructions need to be repeated before Mr. Frank can follow through with the treatment regimen? Prognosis for recovery will be based in part on his cognitive performance skills. (A referral to physical therapy for ambulation training with a cane is essential.)

Next, the OT, with input from Mr. Frank, assesses the occupations—or daily tasks related to work, play, and leisure (performance patterns)—that will both increase his functional abilities and be most important to him. He will participate in his rehabilitation only if he finds basic ADL and instrumental ADL meaningful (i.e., cultural and social contexts). Selecting activities that are a priority for Mr. Frank, with or without the use of adaptive devices (i.e., activity demands), will reduce his depression, increase the strength in his affected arm, and reduce his shoulder pain (i.e., client factors). (Specific dynamic or static positioning will be recommended for each activity.)

The OT also discusses with Mr. Frank how he fell out of bed and asks him how he thinks it happened. A basic ADL assessment that focuses on transfers in and out of the hospital bed is a priority. Is the bed higher than the one he has at home? A new environment increases fall risk and must be assessed immediately. Motivation to accept transfer training should increase if Mr. Frank can recognize the difference it could make to his safety and therefore his well-being. Mr. Frank's awareness or lack thereof of safety issues may indicate cognitive perceptual-sensory deficits or clinical depression. Further assessments to differentiate these conditions, if not already conducted by members of the team, are critical before effective treatment can be planned and implemented. Correct transfer techniques will be demonstrated to nursing staff when the cause of the problem is determined. The occupational therapist also considers whether antihypertensive medication may have caused postural hypotension or whether other medications may be contributing to confusion or dizziness—all risk factors for falls. After hearing Mr. Frank's response and reviewing his medical chart, consultation with other team members may be initiated.

Conversation with Mr. Frank reveals that he was upset about not being able to remember his telephone number. This will be addressed by The Arnadottir OT-ADL Neurobehavioral Evaluation (A-One) performed by OTs trained in its use. The assessment provides an analysis of functional activities to identify cognitive-skill deficit areas. The OT will administer a cognitive and psychological screen, such as the Folstein Mental Status Examination (MMSE) and the Geriatric Depression Scale (GDS), if not conducted by other team members in this setting. The differential diagnosis between a cognitive impairment and depressive pseudodementia is a challenge and is the responsibility of the team. The client's strong expressions of distress and unkempt appearance and the location of the vascular lesion may signal depression as a co-morbid condition.

After evaluating Mr. Frank's immediate needs, the OT discusses future needs and develops OT interventions aimed at reducing performance deficits in ADL and enhancing the abilities and roles that are important to Mr. Frank.

Summary

OTs frame function in occupation, or the ability to perform meaningful daily tasks related to performing self-care; being productive; and engaging in leisure, educational, and social activities. Functional assessment instruments in OT, standardized and nonstandardized, address multiple domains of function to determine causes of limitations and present or potential strengths. They include the "Occupational Profile," which involves history-taking and ascertaining what is important to clients, as well as their needs and hopes. Interviews, self-reports, and observation (e.g., basic self-care, IADL, work, leisure, and social participation) are critical components of the evaluation process. Periodic reassessments determine whether treatment and goals need to be modified or have been attained.

Referral to OT is indicated when older adults are demonstrating early functional decline and are at risk for increased morbidity and dependency, or after they have sustained an illness or injury that impedes function. An OT evaluation is beneficial to older adults, as well as their caregivers, in determining how much assistance in basic ADL and instrumental ADL is required and how much improvement is possible. Through remediation or compensatory strategies, OTs assist older adults to remain as independent as possible, preventing or reducing premature functional decline and dependency.

Patricia A. Miller

See also

Activities of Daily Living
Falls Prevention
Measuring Physical Function
Multidimensional Functional Assessment: Instruments
Multidimensional Functional Assessment: Overview Rehabilitation

Internet Resources

American Occupational Therapy Association
http://www.aota.org

Canadian Occupational Performance Measure (COPM)
http://www.aota.org

The Contextual Memory Test, J. P. Toglia: Therapy Skill Builders
http://www.tpcweb.com

U.S. Government (2005). Summary Report for 29-1122.00: Occupational Therapists. Available at
http://online.onetcenter.org/link/summary/29-1122.00

REFERENCES

Arnadottir, G. (1990). *The brain and behavior: Assessing cortical dysfunction through activities of daily living.* St. Louis, MO: CV Mosby.

Baum, C., & Edward, D. F. (1993). Cognitive performance in senile dementia of the Alzheimer's type: The Kitchen Task Assessment. *American Journal of Occupational Therapy*, *47*, 431–435.

American Occupational Therapy Association, Inc., Commission on Practice (2002). *Occupational therapy practice framework domain and process.* Bethesda, MD.

Seibert, C., & AOTA Commission on Practice (2005). *Occupational therapy practice guidelines for home modification.* Bethesda, MD: American Occupational Therapy Press.

OLDER AMERICANS ACT

In 1965, the U.S. Congress enacted proposals that established three major federal programs to address the needs of older Americans. In signing these laws, President Lyndon B. Johnson created the nation's Medicare and Medicaid programs and the programs funded under the Older Americans Act (OAA).

The federally administered Medicare health insurance program provides qualified Americans with access to and coverage for health care delivered in hospitals, clinics, private physicians' offices, and, to a limited degree, the home. Medicare services are entitlements. A person need only qualify under the age and or disability requirements to be eligible for these services. Conversely, the state-administered federal Medicaid program is needs-based and covers the costs of institutional long-term care, including skilled-nursing facilities and limited home care. To be eligible for Medicaid benefits, the recipient must meet asset and income limitations.

In sharp contrast, the OAA was given a broader agenda but has received more modest appropriations from Congress to fund grants for State and Community Programs on Aging (Title III)—specifically, Supportive Services and Senior Centers (Title IIIB). It also authorizes and funds Congregate Nutrition Services (Title IIIC1) and Home Delivered

Nutrition Services (Title IIIC2); Training, Research, and Discretionary Projects and Programs (Title IV); Grants for Native Americans (Title VI); and Allotments for Vulnerable Elder Rights Protection Activities (Title VII). These programs are administered through a partnership of the federal Administration on Aging, State Units on Aging (SUAs), and Area Agencies on Aging.

The OAA provides a broad set of 10 core national values and objectives that attempt to accommodate the needs of America's aging population (42 USCS § 3001). Although the OAA does not base its benefits on socioeconomic status, it does direct specific attention to persons who are in greatest need, with particular attention to low-income minority individuals. To that end, the OAA established the Administration on Aging, as an operating division within the U.S. Department of Health and Human Services, and the Aging Network of State and Area Agencies on Aging.

The latter has the responsibility to assess the needs of older individuals, at the state and local levels. Thereafter, in response to that assessment, it is then empowered with the development and implementation of new or improved programs and comprehensive and coordinated systems to serve older individuals. The purpose of the OAA is to utilize federal funds to stimulate greater investments of state, local, and private dollars to meet the identified needs of older persons.

Aims of the OAA

The 10 objectives detailed in Title I of the OAA attempt to specify requisites for an adequate quality of life for older persons. They include a recognition of the need for an "adequate income in retirement in accordance with the American standard of living," "the best possible physical and mental health," and the importance of "a comprehensive array of community-based, long-term care services . . . to appropriately sustain older people . . . [and] support . . . family members and other persons providing voluntary care." Title I also calls for opportunities for employment; meaningful civic, cultural, educational, training, and recreational activities; and other desirable opportunities and conditions.

Some have criticized the aims of the OAA as being too broad and too multidimensional in scope. Others have objected to the act's singular focus on older persons. For still others, the act articulates a set of aspirations and commitments that serve as a societal benchmark for a segment of the population that might otherwise be overlooked.

Because explicit implementation programs are not identified, the Administration on Aging and the Aging Network have considerable latitude in their advocacy for and pursuit of implementation activities. Since enactment of the OAA in 1965, a number of initiatives have been launched by the Administration on Aging and the Aging Network. The most recent examples are the National Family Caregiver Support Program and National Life Course Planning Program.

Structure and Roles of the Aging Network

The Aging Network, established by the OAA and led by the Administration on Aging, includes 57 SUAs and approximately 650 Area Agencies on Aging—all administrative units that were authorized by the 1973 amendments. More than 220 tribal organizations representing some 300 Native American tribes and about 27,000 service providers are also part of the Aging Network. In addition, more than 40 national organizations represent service provider, advocacy, minority elderly American, retiree labor, and other aging groups. Many of these organizations receive OAA funds through Titles III, IV, V, VI, and VII.

The responsibilities borne by state and area agencies on aging have expanded during the last 2 decades, with one-third of all state units administering programs for disabled adults, including Medicaid waiver and large state-funded home- and community-based service programs, as well as OAA programs and services. Such an evolution in the role of state units is in keeping with the OAA's aim of systems development.

Reauthorization and Funding of the OAA

Although OAA programs and services continue to receive support through Congressional appropriations, these expenditures are among the more thorny issues considered by Congress. Unfortunately, these appropriations continue to be advocated along partisan lines. To enable states to modernize service-delivery systems, the Administration on Aging continues to propose initiatives and strive for its due share of federal funding to implement its stated objectives.

From the individual's standpoint, unlike Medicare and Medicaid, there are no direct benefits available to persons under the OAA. Individuals must look to the availability of services, indirectly funded by the OAA through their state and local agencies. The OAA is the legislation that attempts to identify the broad demographic needs of an entire segment of the population, as opposed to the welfare of individual persons or groups.

The efficacy of this type of legislative policy is directly proportional to the genuine desire of legislators to appropriate funds for the common good of this segment of the population. The nature of the legislation is such that individual members of Congress will not receive the type of benefit, from the recognition of their constituents, that would result from more direct-funding projects and other so called pork projects. The best realistic hope for genuine bipartisan funding is through the lobbying efforts of groups such as the American Association of Retired Persons and similar groups. However, the same indirect nature of the funding that affects legislators also diminishes the direct impact of a decision to expend lobbying dollars to influence additional funding of the OAA.

The Future

Demographic projections for 21st-century America indicate that ours will be a nation with more older adults than younger persons. Between 2011 and 2030, the baby boom generation, comprising some 76 million individuals, will become older Americans. Thus, as many policy makers have observed, the aging of the population will be one of the major challenges facing them in the immediate future and for the long term.

The Aging Network had demonstrated through everyday practice and through its addressing of emerging concerns that it is interested in evolving its service-delivery models by using new technologies and evidence-based interventions. In addition to obtaining adequate funding, the future of OAA services and programs will depend on how proactively and creatively the executive and legislative branches of federal, state, and local governments utilize the flexibility inherent in the law. The future welfare of our aging population will be shaped in the next 10 years. Difficult decisions await us because the necessary changes may include cuts in entitlement. It remains to be seen whether our elected leaders will take up this challenge and ensure the foundation for the future of all Americans.

William T. Lawson

See also

Aging Agencies: City and County Level
Aging Agencies: Federal Level
Aging Agencies: State Level
Long-Term-Care Financing: International Perspective
Retirement
Senior Centers

Internet Resources

Administration on Aging
http://www.aoa.gov

Center for Social Gerontology: Reauthorization of the Older Americans Act
http://www.tcsg.org/law/oaa/reauth.htm

The National Association of State Units on Aging (NASUA)
http://www.nasua.org/2006%20OAA%20Policy%20Recommendations.pdf

National Family Caregiver Support Program
http://www.aoa.gov/prof/aoaprog/caregiver/caregiver.asp

National Center of Elder Abuse
http://www.elderabusecenter.org/default.cfm?p=lawslegislation.cfm

National Life Course Planning Program.
http://www.aoa.gov/prof/aoaprog/caregiver/caregiver.asp

ORAL HEALTH ASSESSMENT

Despite increasing awareness of the need for dental care, many older people have poor oral health, inadequate oral hygiene, carious teeth, are edentulous (i.e., loss of all teeth), and lack or have poorly fitting dentures. Oral health problems often affect an individual's well-being, self-esteem, and quality of life (Kayser-Jones, Bird, Paul, Long, & Schell, 1995). Maintaining oral health in old age is important because untreated dental problems can cause pain and discomfort that may interfere with eating and swallowing, resulting in inadequate nutritional intake. Poor oral health can also lead to life-threatening conditions including, for example, brain abscesses, vascular heart disease, and respiratory infections.

Oral carcinoma is a concern. According to a report of the U.S. Surgeon General, about 30,000 cases of oral and pharyngeal cancer are diagnosed yearly, resulting in 8,000 deaths annually (U.S. Department of Health and Human Services, 2000). Most of these cases occurred in older people. Early detection and treatment are the most important factors in reducing oral-cancer morbidity and mortality (Shiboski, Shiboski, & Silverman, 2000).

Although edentulism has declined since the 1970s, about 30% of people 65 years and older are edentulous (U.S. Department of Health and Human Services, 2000). Lower socioeconomic status, geographic region, cultural factors, and education influence oral health care. Among older Americans, 63.7% of those with 12 or more years of education have retained most of their natural teeth, compared with 30.5% of those with fewer than 12 years of education (Centers for Disease Control and Prevention, 2003).

Numerous studies document the high prevalence of oral disease among nursing-home residents and the need for evaluation and treatment (Jablonski, Munro, Grap, & Elswick, 2005). Barriers to obtaining oral health care in nursing homes include a shortage of skilled geriatric dentists, lack of private dental insurance, low reimbursement rates to treat Medicaid patients, and no Medicare coverage for dental care.

Federal regulations state that nursing facilities must provide routine and emergency dental services (including an annual oral health examination), cleaning, repair, inspection for signs of dental disease, and radiographs or other procedures as needed (Centers for Medicare & Medicaid Services, 2001). How dental care is provided may vary from state to state. In California, for example, many nursing homes do not have dentists on staff; dental services are provided by contract, usually during monthly visits. If emergency dental care is needed, it is provided only if the family, resident, or nurse requests care. Although nursing staff—registered nurses (RNs), licensed vocational nurses (LVNs), and certified nursing assistants (CNAs)—are responsible for providing oral hygiene and are therefore in a position to identify oral health problems, most nursing staff have limited or no preparation in assessing oral health.

Kayser-Jones Brief Oral Health Status Examination

The Kayser-Jones Brief Oral Health Status Examination (BOHSE) was designed to provide nursing-home staff with a tool that could be used to assess oral health. It was developed based on recommendations from the American Dental Association, a review of available oral assessment guides, and consultation with dental-school faculty. Ten items reflect the status of oral health and function: lymph nodes, lips, tongue, tissue inside cheek, floor and roof of mouth, gums between teeth or under artificial teeth, saliva, condition of natural teeth, condition of artificial teeth, pairs of teeth in chewing position, and oral cleanliness. Each item has three descriptors and is rated on a 3-point scale (0, 1, 2)—0 indicating the healthy end and 2 the unhealthy end of the scale (see Figure O.1). The final score is the sum of the scores from the 10 categories and can range from 0 (very healthy) to 20 (very unhealthy) (Kayser-Jones, Bird, Paul, Long, & Schell, 1995). It must be emphasized that the Kayser-Jones BOHSE is for screening purposes only; it is not a diagnostic tool and it does not replace the need for an annual examination by a professional dentist.

In doing the assessment when this instrument was being developed, several residents were referred for immediate dental care for conditions discovered during data collection, including an infected root tip, a moderately severe case of lichen planus, a gum abscess, gingivitis, several cases of candidiasis, and poorly fitting or broken dentures. The residents with these conditions had not complained to the staff; these problems were discovered only through participation in the research project (Kayser-Jones et al., 1995). In a study using the Kayser-Jones BOHSE with residents with Alzheimer's disease, the investigators found that the nursing staff was unaware that two of their residents wore dentures. The residents' dentures had never been removed although they had lived in the facility for several months (Lin et al., 1999).

Since the initial publication of this tool, the original or modified versions have been used in numerous countries around the world, including Australia, Taiwan, Sweden, Germany, Turkey, and Japan. It is also being used to assess oral health in hundreds of facilities in the United States and abroad, and it can be used in a variety of settings, including residential and acute care and in the community. It has also been found to be useful with residents who are cognitively impaired and are unable to request dental services (Chalmers & Pearson, 2005; Lin et al., 1999).

Advantages of Oral Health Examinations by Nursing Staff

Nurses are in an excellent position to conduct an oral health examination. They are well acquainted with residents and are familiar with their habits, behaviors, likes, and dislikes. A resident who refuses to be examined one day can be examined the following day. Nurses can examine residents on a regular basis, which is especially important for people with cognitive impairment and non–English-speaking residents who may be unable to report pain or discomfort. Moreover, if there is a change in a resident's behavior, such as refusal to eat, the nurse can do an examination to rule out oral disease. Involving the nursing staff leads to earlier recognition of problems and may prevent systemic infections or other situations such as weight loss. Further, teaching nursing staff to do an oral health assessment increases their awareness of the importance of dental health and oral hygiene.

Given the high level of unmet dental needs in nursing homes and the relationship among oral health status, physical health, and well-being, nurses, dentists, and physicians should collaborate in addressing this important problem.

JEANIE KAYSER-JONES
TARA SHARPP

See also

Dental Implants
Dentures
Geriatric Dentistry: Clinical Aspects
Oral Health Assessment
Xerostomia

Internet Resources

American Dental Association
http://www.ada.org/

International Association for Dental Research
http://www.iadr.com/start.html

National Institute of Dental and Craniofacial Research
http://www.nidcr.nih.gov/

Resident's Name _______________________ Date ____________________

Examiner's Name ______________________ **TOTAL SCORE** ___________

CATEGORY	MEASUREMENT	0	1	2
LYMPH NODES	Observe and feel nodes	No enlargement	Enlarged, not tender	Enlarged and tender*
LIPS	Observe, feel tissue and ask resident, family or staff (e.g., primary caregiver)	Smooth, pink moist	Dry, chapped, or red at corners*	White or red patch, bleeding or ulcer for 2 weeks*
TONGUE	Observe, feel tissue and ask resident, family or staff (e.g., primary caregiver)	Normal roughness, pink and moist	Coated, smooth, patchy, severely fissured or some redness	Red, smooth, white or red patch; ulcer for 2 weeks*
TISSUE INSIDE CHEEK, FLOOR AND ROOF OF MOUTH	Observe, feel tissue and ask resident, family or staff (e.g., primary care giver)	Pink and moist	Dry, shiny, rough red, or swollen*	White or red patch, bleeding, hardness; ulcer for 2 weeks*
GUMS BETWEEN TEETH AND/OR UNDER ARTIFICIAL TEETH	Gently press gums with tip of tongue blade	Pink, small indentations; firm, smooth and pink under artificial teeth	Redness at border around 1-6 teeth; one red area or sore spot under artificial teeth*	Swollen or bleeding gums, redness at border around 7 or more teeth, loose teeth; generalized redness or sores under artificial teeth*
SALIVA (EFFECT ON TISSUE)	Touch tongue blade to center of tongue and floor of mouth	Tissues moist, saliva free flowing and watery	Tissues dry and sticky	Tissues parched and red, no saliva*
CONDITION OF NATURAL TEETH	Observe and count number of decayed or broken teeth	No decayed or broken teeth/roots	1-3 decayed or broken teeth/roots*	4 or more decayed or broken teeth/roots; fewer than 4 teeth in either jaw*
CONDITION OF ARTIFICIAL TEETH	Observe and ask patient, family or staff (e.g., primary caregiver)	Unbroken teeth, worn most of the time	1 broken/missing tooth, or worn for eating or cosmetics only	More than 1 broken or missing tooth, or either denture missing or never worn*
PAIRS OF TEETH IN CHEWING POSITION (NATURAL OR ARTIFICIAL)	Observe and count pairs of teeth in chewing position	12 or more pairs of teeth in chewing position	8-11 pairs of teeth in chewing position	0-7 pairs of teeth in chewing position*
ORAL CLEANLINESS	Observe appearance of teeth or dentures	Clean, no food particles/tartar in the mouth or on artificial teeth	Food particles/tartar in one of two places in the mouth or on artificial teeth	Food particles/tartar in most places in the mouth or on artificial teeth

Upper dentures labeled: Yes ☐ No ☐ None ☐ Lower dentures labeled: Yes ☐ No ☐ None ☐

Is your mouth comfortable? Yes ☐ No ☐ If No, explain:

***Underlined = refer to dentist immediately**

____

Additional comments: ____

____

FIGURE O.1 Kayser-Jones Brief Oral Health Status Examination. © 1995, Regents of the University of California, San Francisco. All rights reserved. Used with permission. The author acknowledges the assistance of William F. Bird, D.D.S., Dr.P.H., in the development of this instrument.

Oral Health America
http://www.oralhealthamerica.org/home.html

REFERENCES

Centers for Disease Control and Prevention (2003). *Public health and aging: Retention of natural teeth among older adults—United States, 2002*. U.S. Department of Health and Human Resources, Centers for Disease Control and Prevention.

Centers for Medicare & Medicaid Services (2001). Surveyor's Guideline to Title 42 Code of Federal Regulations, Section 483.55, Appendix PP to CMS State Operation Manual: Centers for Medicare & Medicaid Services, U.S. Department of Health and Human Services.

Chalmers, J., & Pearson, A. (2005). Oral hygiene care for residents with dementia: A literature review. *Journal of Advanced Nursing*, *52*(4), 410–419.

Jablonski, R. A., Munro, C. L., Grap, M. J., & Elswick, R. K. (2005). The role of biobehavioral, environmental, and social forces on oral health disparities in frail and functionally dependent nursing home elders. *Biological Research for Nursing*, *7*(1), 75–82.

Kayser-Jones, J., Bird, W. F., Paul, S. M., Long, L., & Schell, E. S. (1995). An instrument to assess the oral health status of nursing home residents. *Gerontologist*, *35*(6), 814–824.

Lin, C. Y., Jones, D. B., Godwin, K., Godwin, R. K., Knebl, J. A., & Niessen, L. (1999). Oral health assessment by nursing staff of Alzheimer's patients in a long-term-care facility. *Special Care in Dentistry*, *19*(2), 64–71.

Shiboski, C.H., Shiboski, S.C., Silverman, Jr., S. (2000). Trends in oral cancer rates in the United States, 1973–1996. *Community Dentistry Oral Epidemiology*, *28*, 249–256.

U.S. Department of Health and Human Services (2000). *Oral health in America: A report of the surgeon general.* Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health.

OSTEOARTHRITIS

Osteoarthritis (OA), the most common rheumatic disease, disproportionately affects older populations, becoming increasingly prevalent until the age of 80. Radiographic changes typical of OA can be found in most people aged 65 and older, most commonly affecting the hands, knees, hips, and spine. Although patients may have radiographic evidence of disease, they may be asymptomatic. The correlation between radiographic changes and symptoms attributable to OA is greatest for the knee and least for the hands.

Patients with OA typically complain of pain that is made worse by activity and relieved by rest. Stiffness after a period of immobility is brief, as in morning stiffness, a complaint that helps distinguish OA from inflammatory arthritis such as rheumatoid arthritis (RA). Prolonged activity increases symptoms of OA, whereas symptoms produced by inflammatory arthritis are ameliorated by activity. Patients may note joint swelling, but the affected joint does not become inflamed, red, or hot.

Loss of hyaline cartilage is the pathologic hallmark of OA, although all structures of the joint, including subchondral bone and juxta-articular muscle and tendon, are affected. Although OA was once dismissed as an inevitable result of aging, it is now recognized as a result of a complex interaction of biochemical, environmental, and genetic factors. Treatment typically focuses on relief of pain and improving function, and therapeutic goals now include disease-modifying drugs that slow the progression of cartilage loss, which is the standard of care in RA.

Pathophysiology

OA results from the complex interplay between mechanical and biochemical processes. Imbalance between cartilage degradation and repair results in a net loss of cartilage, the hallmark of OA, in association with the remodeling of subchondral bone. The chondrocyte, the cell responsible for cartilage metabolism, exists in a relatively acellular matrix consisting of proteoglycans, Type II collagen, and noncollagen matrix proteins. The proteoglycans present as large aggrecans that consist of hyaluronate, chondroitan, and keratin sulfate. Cartilage lacks a blood supply, and nutrients necessary for normal cartilage health reach deeper layers of cartilage by traversing the metabolically active matrix overlying subchondral bone. The imbalance between degradation and repair determines the progression from softening of cartilage to fibrillation, ulceration, and eventual cartilage loss. Protease enzymes, such as stromolysin and other metalloproteinases, are responsible for degrading cartilage. Pro-inflammatory cytokines such as Il-1 and TNF-a accelerate tissue break down releasing proteases from chondrocytes. A cycle of injury can also be initiated by mechanical stress, as well as cytokine suppression of normal repair processes mediated by tissue inhibitors of metalloproteinases (TIMP).

Genetic factors play an important role in the development of OA. Mutations in the genes for cartilage constituents such as Type II collagen can lead to premature generalized OA. Marked differences in patterns of OA exist. Patients who have undergone hip replacements are more than three times as likely to have siblings undergoing hip replacements. Southern Chinese and South African Blacks have a very low incidence of hip OA (Paget & Yee, 2005).

Risk Factors

Obesity and quadriceps-muscle weakness consistently affect the incidence and prevalence of OA of the knee. Quadriceps weakness can antedate symptoms due to OA of the knee. Obese women have increased incidences and symptoms of OA of the knee, but they decrease with weight reduction. Occupations that involve lifting, bending, kneeling, and squatting increase the incidence of OA of the knee, which is magnified by obesity. Trauma, including surgical trauma such as open meniscectomy, as well as fractures, increase the risk of developing OA. Genetic risks are greatest for OA of the hands and hips. Patients with congenital dysplasia of the hip, where the acetabular cup is too shallow to provide mechanically sound support for the hip, develop OA at an early age. Although recreational sports such as jogging do not increase the incidence of OA, impact sports such as football can increase its risk. Hypermobility and joint laxity increase the risk of development of OA.

Management

Managing OA requires early recognition and intervention. Diagnosis can be made on the basis of the typical history of brief periods of morning stiffness and gelling, as well as pain that increases with activity. Joint crepitus without inflammation supports the diagnosis. Careful evaluation is important to separate causes of pain. Hip disease may confuse clinicians with referred pain to the knee, and back disease can produce referral pain patterns to distal limbs.

Plain X-rays reveal typical joint-space narrowing as well as subchondral sclerosis, bone cysts, and osteophyte formation. There are no blood tests that support the diagnosis, but lab studies can exclude other inflammatory entities when the history or exam is equivocal. MRI is rarely indicated if plain X-ray reveals evidence of OA. Joint aspiration, when indicated, can distinguish OA from infection or inflammatory causes of arthritis by analysis of the joint fluid, which will typically have fewer than 1,000 white blood cells per cubic millimeter.

Management of OA includes concurrent pharmacologic as well as physical and surgical therapies. The goal of therapy has traditionally been relief of symptoms and improvement in function via analgesia and correction of mechanical problems such as misalignment or limb-length discrepancies. Current improvements in understanding the dynamics of OA pathogenesis have led to the exploration of disease-modifying interventions to slow the progression of cartilage loss and joint-space narrowing (Felson, 2006).

Nonpharmacological Treatment

The American College of Rheumatology published treatment guidelines for knee and hip OA that emphasize the importance of nonpharmacological interventions (Altman, et al. 2000). The role of physical therapy (PT) and occupational therapy (OT) cannot be overemphasized. Effective PT includes localized modalities such as heat, ultrasound, and ice, along with a graduated exercise regimen to improve joint range of motion and motor strength. Hydrotherapy, a low-impact protocol, is often very effective in individuals with OA of the knee and hip.

Physical therapists can fit supportive devices and orthotics that reduce pain and improve function. Individuals with unicompartmental tibiofemoral arthritis may benefit from a lightweight "unloading" knee brace. In addition, a vasoelastic insert or a wedged insole may help those with medial-compartment OA of the knee. These devices can help restore normal biomechanics. A properly used cane can also provide effective "unloading" of an involved knee or hip. The cane length should be equal to the distance from the bottom of the shoe heel to the wrist crease when the arm is held at the side. For the cane to be effective, it must be used on the side opposite the involved leg. Mobility in this manner often takes practice.

Acupuncture produced significant short-term improvement (i.e., up to 40% of patients benefited) for elderly patients with OA of the knee who remained on standard anti-inflammatory and analgesic medications.

Pharmacological Treatment: Analgesia

Rubifacients have long been used by patients seeking relief, but only recently has scientific evidence supported the use of one topical treatment, capsaicin. Capsaicin depletes substance P by enhancing its release from unmyelinated C nerve fibers and is available in various strengths. Lower concentrations (i.e., 0.025%) need to be applied four times daily, whereas higher concentrations (i.e., 0.075%) can be applied twice daily. Lidocaine can be administered via patch and also provides localized pain relief.

Nonsteroidal anti-inflammatory drugs (NSAIDs) provide both analgesic and anti-inflammatory activity. Acetaminophen is an effective analgesic, although patients usually prefer NSAIDs over acetaminophen. NSAIDs and cyclooxygenase-2 (COX-2) inhibitors are more effective in providing relief from pain caused by osteoarthritis than acetaminophen. There are significant potential side effects of the NSAIDs and COX-2 inhibitors. Gastrointestinal toxicity, including ulcer formation and risk of bleeding, increases in patients who are older than 65. This is the most common reason for discontinuing NSAID use and can be decreased by the concomitant use of misoprostal or a proton pump inhibitor. Although the COX-2 inhibitors confer less gastrointestinal risk, the recently identified risk of vascular events has limited their use.

Drug interactions are a concern in patients in an age group for whom polypharmacy is common. Coumadin levels can be increased and its bleeding effects potentiated by simultaneous use of coumadin and NSAIDs. Fluid retention and hypertension can be increased. However, for those elderly who do not benefit from other methods of providing analgesia, these drugs can be used with care.

Intra-articular Therapy

Judicious use of intra-articular corticosteroid injections (no more than three to four times a year) can be very effective, especially in patients with a single painful joint. Commonly used preparations include triamcinolone acetonide and methylprednisolone at a dose of 40 mg, often mixed with 1 to 2 mL of 2% lidocaine for a large joint like the knee. Efficacy is rarely sustained for longer than 3 to 4 weeks. There is no role for systemic corticosteroids in the treatment of OA.

Hyaluronic-acid supplementation can be administered as a series of intra-articular injections. Hyaluronic acid is a major constituent of cartilage, although injected hyaluronate is rapidly cleared from the joint after injection. Several meta-analyses have found minimal benefit in pain relief from hyaluronic-acid injections when compared in multiple studies to intra-articular steroid injections or NSAIDs, however, there is a trend toward benefit in patients with early OA.

Disease-Modifying Therapy

The dynamic pathology of OA has become an appropriate target for intervention, much as in RA. It has been difficult to study interventions in progression of OA because measuring the endpoint of therapy, joint-space narrowing, was difficult to reproduce. Recently, radiographic measurements have been standardized. An anteroposterior (AP) view of the semi-flexed knee, positioned fluoroscopically, provides a reliable measure. It may take years to observe the effects of interventions in a disease like OA, making studies extremely difficult. Surrogate markers, a convenient substitute for an endpoint that correlates with pathology and would not require years of observation, were not available for OA. Recent studies have offered potential solutions. Collagen and aggrecan, the major constituents of cartilage, are degraded by metalloproteinases (MMP), including collagenase and stromolysin. Elevations in serum MMP levels predict joint-space narrowing. Doxycycline, which reduces MMP activity, decreased joint-space narrowing in knee OA in a clinical trial using standardized radiographs. This provides the first clear evidence that the progression of OA can be modified pharmacologically (Brandt et al., 2005).

Chondroitin sulfate and glucosamine sulfate have been used to treat OA. A recent large multicenter controlled trial has not demonstrated effective pain relief when compared to celecoxib and placebo except for a small benefit in patients with moderate to severe pain, who were identified by subgroup analysis, which is a methodologically suspect approach. Clegg et al. (2006) report data regarding glucosamine and chondroitin on joint-space narrowing

Surgery

Total joint replacement is highly effective for advanced OA of the hip and knee and is indicated for patients who have continued pain and loss of function attributable to advanced radiographic OA. For those in whom major surgery is appropriate, most report satisfactory results from surgery when pain, walking ability, and range of motion are assessed. Newer component materials as well as less traumatic (i.e., minimally invasive) surgical advances have improved outcomes. Complications such as infection, leg-length discrepancy, dislocation, and persistent pain can cause dissatisfaction.

Arthroscopic surgery can relieve symptoms in OA of the knee. However, in the absence of mechanical symptoms such as locking or buckling, patients are not likely to benefit from arthroscopy. In a controlled trial comparing arthoscopic debridement or lavage with sham surgery, OA patients obtained no benefit from either procedure. Moreover, many patients with OA of the knee go on to joint-replacement surgery within the next 3 years (Moseley et al., 2002).

SUSAN GOODMAN

See also

Musculoskeletal System
Rheumatoid Arthritis

Internet Resources

Agency for Healthcare Research and Quality
http://www.ahrq.gov/research/osteoria/osteoria.htm

American Academy of Family Physicians
http://www.aafp.org/afp/20000315/1795.html

The Arthritis Foundation
http://www.arthritis.org/research/ResearchUpdate/03Mar_Apr/PrevelanceHandOsteoarthritis.asp

Johns Hopkins Arthritis Center
http://www.hopkins-arthritis.som.jhmi.edu/osteo/osteo_clin_pres.html

REFERENCES

Altman, D. R., Hochberg, M. C., & Moskowitz, R. (2000). Subcommittee on Osteoarthritis Guidelines. *Arthritis & Rheumatism*, *43,* 1905–1915.

Brandt, K. D., Mazzuca, S. A., Katz, B. P., Lane, K. A., Buckwalter, K. A., Yocum, D. E. et al. (2005) Effects of doxycycline on progression of osteoarthritis. *Arthritis & Rheumatism*, *52*, 2015–2025.

Clegg, D. O., Reda, D. J., Harris, C. L., Klein, M. A., O'Dell, J. R., Hooper, M. M., et al. (2006).

Glucosamine, chondroitin sulfate, and the two in combination for painful knee osteoarthritis. *New England Journal of Medicine*, *354*(8), 795–808.

Felson, D. T. (2006). Osteoarthritis of the knee. *New England Journal of Medicine*, *354*(8), 841–848.

Hochberg, M. M. (2006). Nutritional supplements for knee osteoarthritis: Still no resolution. *New England Journal of Medicine*, *354*(8), 858–860.

Moseley, J. B., O'Malley, K., Petersen, N. J., Menke, T. J., Brody, B. A., Kuykendall, D. H., et al. (2002.) A controlled trial of arthroscopic surgery for osteoarthritis of the knee. *New England Journal of Medicine*, *347*(2), 81–88.

Paget, S., & Yee, A. (2005). Expert Guide to Rheumatology. *Osteoarthriti*s. Philadelphia, PA: American College of Physicians (pp. 269–283).

OSTEOPOROSIS

Osteoporosis is a systemic skeletal disorder characterized by microarchitectual disruption of bone and an increased susceptibility to fracture. Approximately 10 million men and women in the United States have osteoporosis and an even greater number have osteopenia. Osteoporosis is four times more prevalent in women than in men. The most common types of osteoporotic fractures include vertebral, hip, and wrist. The yearly mortality rate associated with a hip fracture is 10% to 20%, and men have a higher mortality rate than women. Even if a patient does not die after hip fracture, the chance of significant disability (i.e., needing a cane or walker) indefinitely remains. Vertebral fractures can result in kyphosis, early satiety/abdominal complaints, and restrictive lung disease. All osteoporotic fractures can result in a fear of ambulation and a sense of loss of independence.

Pathophysiology

Bone is composed of matrix, primarily Type II collagen, and mineral, primarily hydroxyapatite. There are two types of bone, cancellous and cortical. Vertebral bodies are examples of cancellous bone. Because they have a large bone-surface area, often bone loss or formation is first detected in these areas. Cortical bone, which is found in the hip, is denser (Seeman & Delmas, 2006).

There are three major cell types in bone. The osteoblast is responsible for bone resorption and the osteoclast is responsible for bone resorption; these processes are tightly coupled. The osteocyte is responsible for communication within the complex boney structure. Much research has focused on the receptor activator of NFkappaB ligand (RANKL) and its receptor, RANK. This interaction promotes osteoclast different ion. Osteoprogerin (OPG) controls this system; when OPG binds to RANK then osteoclast differention is abated. Understanding basic bone biology is helpful in understanding the current and proposed treatments of osteoporosis.

Diagnosis

Dual energy X-ray absorptiometry (DEXA) is considered the "gold standard" for the measurement of bone mineral density (BMD). Lumbar spine and hip measurements are classically reported. Repeat densities should be done on the same machine type because different types (i.e., Lunar versus Hologic) cannot be compared. Medicare permits a measurement every 2 years; third-party payers permit a bone density every 1 to 2 years. The National Osteoporosis Foundation (NOF) recommends a baseline density at age 65 for women. Most in this field recommend a baseline bone density at menopause and earlier if there are significant risk factors. Many recommend that men have a baseline bone density at age 70, earlier if there are risk factors.

Peak bone mass is reached at 30 years of age. The T-score represents a comparison of BMD to a healthy 30-year-old of similar gender and ethnicity. The Z-score is a comparable comparison to an age-matched control. Risk of fracture is often expressed in terms of BMD. For every 1 standard deviation decrease in BMD, fracture risk is increased by 1.5- to 2.7-fold. In women, bone density decreases about 0.5 % per year, until menopause, then 2% to 5% year for the 2 years before menopause and for 2 to 5 years after menopause, when density then decreases 0.5%

to 1% per year. Men have a steady decline of 0.5% to 1% per year after age 30.

Risk Factors

Major risk factors for osteoporosis are personal history of a fracture as an adult, history of a fragility fracture in a first-degree relative, weight less than 127 pounds, current tobacco use, and use of corticosteroid therapy for more than 3 months. Minor risk factors include any illness that is associated with an increased risk of falls, more than two alcoholic beverages per day, low calcium/vitamin D intake, and low physical activity. Many medical conditions such as malabsorption states and multiple myeloma increase the risk of osteoporosis. Medications including corticosteroids and many anticonvulsants increase the risk of osteoporosis.

Treatment

The NOF recommends treating a postmenopausal woman with a T-score of -2.0 or a T-score of -1.5 if she has additional risk factors. The treatment of men is more controversial because it is unclear if men have the same risk of fracture for the same T-score.

Calcium/Vitamin D

Secondary hyperparathyroidism may be associated with a lack of calcium and/or vitamin D intake or absorption and is felt to be deleterious to bone health. Vitamin D deficiency is associated with osteomalacia. Many studies document low vitamin D levels in the population as a whole.

Treatment of osteoporosis should first focus on an appropriate daily amount of calcium and vitamin D. It is recommended that patients get 1,500 mg/day of calcium and at least 800 IU/day of vitamin D. A serum 25-vitamin D level of 30 ng/ml or greater is desirable. A recent study points out that if women are getting this amount of calcium and vitamin D in their diet, additional supplementation does not prevent hip fracture. Calcium citrate has less chance of precipitating calcium kidney stones than other forms of calcium.

Exercise

Patients should get a regular amount of weight-bearing exercise. In addition to reducing the degree of osteoporosis, exercise promotes balance and agility, thereby reducing the risk of falls and associated fractures. Clinicians should focus on maximizing correction of vision, reducing environmental fall risks, and the safe use of assistive devices.

Pharmacologic Treatment

Pharmacologic treatment is either antiresorptive or anabolic. The common antiresorptive therapies include estrogen-replacement therapy, selective estrogen uptake inhibitors (SERMs), bisphosphonates, or calcitonin. The available anabolic therapy is teriparatide recombinant parathyroid hormone.

Hormone Replacement Therapy (HRT)/SERMs

HRT was used for many years as a mainstay treatment for osteoporosis. In the Women's Health Initiative Study, there were eight fewer hip fractures in the women on HRT. Due to better appreciated side effects of an increased risk of breast cancer and an increased risk and myocardial infarction and stroke, HRT is no longer considered a preferred therapy for the treatment of osteoporosis (Cauley et al., 2003). Raloxifene, a SERM, has been shown to reduce the risk of vertebral fractures but not of hip fractures. Side effects include leg cramps, vasomotor symptoms, and increased risk of thrombosis.

Bisphosphonate Therapy

The bisphosphonates as a class are a potent inhibitor of bone resorption. The available oral agents include alendronate, actonel, and ibandroante. All have the potential side effect of upper gastrointestinal irritation. Alendronate and risedronate reduce the risk of vertebral and hip fractures. Alendronate has been shown to reduce the risk of hip fractures within 6 months of imitating therapy. Ibandronate was recently FDA-approved; the study was not powered to evaluate reduction in hip fractures. Ibandronate, administered intravenously (IV) every 3 to 4 months, is FDA-approved and has been shown to improve both vertebral and hip BMD. Pamidronate (administered IV every 3 to 4 months) and zolendric acid (administered IV yearly) have been used to treat patients intolerant to oral bisphosphonates but they are not FDA-approved for this indication.

Bisphosphonates should not be used in patients with renal insufficiency or in women prior to conception. There is an emerging concern about the risk of osteonecrosis of the jaw. This seems to be rare but is seen most commonly in patients receiving zolendric acid monthly in combination with chemotherapy. It has very uncommonly been seen in patients receiving oral bisphosphonates (Woo, Hellstein, & Kalmar, 2006).

There has been recent controversy over the duration of bisphosphonate therapy. The concern is that if bone resorption is turned off entirely, microdamage will accumulate and result in an increased susceptibility to fracture. The urine N-telopeptide (urine NTX) measures bone resorption. Perhaps if a low result is obtained (i.e., less than 10 nmol BCE/mmol), a bisphosphonate should be discontinued or teriparitide substituted.

Teriparatide

This is recombinant parathyroid hormone, which increases bone formation. It increases bone density and reduces the risk of vertebral and hip fractures (Neer et al., 2001). It is a subcutaneous (20 mg) injection given daily for 2 years. It is generally very well tolerated. The primary concern has been an increased risk of osteosarcoma in study rats. This has not been seen in humans and the risk to humans is felt to be low. This agent seems to be more efficacious if not given simultaneously with bisphosphonates. HRT or a SERM can be given simultaneously. Paget's disease and prior radiation are contraindications for the use of teriparatide; both have been associated with osteosarcoma.

Calcitonin

Data supporting the efficacy of calcitonin are limited; therefore, calcitonin is rarely used in the treatment of osteoporosis.

Future Directions

Recent studies suggest that AMG 162, which binds RANKL and decreases osteoclast different ion, may be another beneficial treatment for osteoporosis.

LINDA RUSSELL

See also
Musculoskeletal System
Osteoarthritis
Rheumatoid Arthritis
Internet Resource
National Osteoporosis Foundation
http://www.nof.org

REFERENCES

Cauley, J. A., Robbins, J., Chen, Z., Cummings, S. R., Jackson, R. D., LaCroix, A Z., et al. (2003). Effects of estrogen plus progestin on risk of fracture and bone density. *Journal of the American Medical Association*, *290*(13), 1729–1738.

Neer, R. M., Arnaud, C. D., Zanchetta, J. R., Prince, R., Gaich, G. A., Reginster, J.-Y., et al. (2001). Effect of parathyroid hormone (1-34) on fractures and bone mineral density in postmenopausal women with osteoporosis. *New England Journal of Medicine*, *344*(19), 1434–1441.

Seeman, E., & Delmas, P. D. (2006). Bone Quality—The Material and Structural Basis of Bone Strength and Fragility. *New England Journal of Medicine*, *354*(21), 2250–2261.

Woo, S-B., Hellstein, J. W., & Kalmar, J. R. (2006). Systematic review: Bisphosphonates and osteonecrosis of the jaw. *Annals of Internal Medicine*, *144*(10), 753–761.

OVER-THE-COUNTER DRUGS AND SELF-MEDICATION

Age-related physiological and psychosocial changes, increasing prevalence of chronic disease, and the likelihood of multiple pathologies predispose older people to experience problems with medications. Medication noncompliance (nonadherence), polypharmacy, and the use and abuse of over-the-counter (OTC) or nonprescription drugs are common. The elderly are the major users and abusers of both OTC and prescription drugs (Roe, 1984). Market surveys suggest that although older Americans spend less on OTC drugs than on prescription drugs, the elderly account for 40% to 50% of all OTC drug purchases, a pattern similar to that in 14 European and North American countries. A study of the elderly in an Australian community found that 18% of men and 25% of women were currently using three or more types of prescription drugs. More women than men (i.e., 44% versus 29%) used two or more types of OTC drugs; and 56% of men and 76% of women using multiple prescribed medications also used multiple OTC drugs, indicating the depth of the problem of self-medication (Simons et al., 1992).

Patients and even health professionals may think of OTC drugs as safe and of little pharmacological significance. All drugs, including OTC medications, carry a level of risk that is less easily characterized in the elderly. Polypharmacy greatly increases the occurrence of adverse reactions and interactions. In addition to “traditional” OTC drugs, self-medication may include the use of nutriceuticals, herbal medicines, and complementary therapies. There is scant research regarding possible interactions among prescription, OTC, and herbal medications.

In general, an OTC drug is purchased without a prescription. However, the range of available OTC drugs varies among countries. For example, in the United States, the nonsteroidal anti-inflammatory drug naproxen was switched from prescription-only to OTC in 1994, but it still requires a prescription in the United Kingdom. OTC drugs can also be differentiated by those that are freely available—for example, in supermarkets—and those that can be provided only by licensed pharmacies. In some countries, certain OTC drugs may be dispensed only when a pharmacist is present. The overall trend is for more drugs to become available as OTCs; indeed, with the growing dominance of the Internet, there is increased marketing of and easier access to OTC medications and nutriceuticals.

A number of preparations once available by prescription only are now available OTC. The H_2-receptor antagonist cimetidine is now available in the United Kingdom without prescription to adults, provided the pack does not contain more than a 2-week supply. Yet, side effects of this drug include diarrhea, other gastrointestinal disturbances, headache, dizziness, tiredness, and rash, and some reports indicate that the drug can mask the symptoms of gastric cancer in those of middle age or older. Less common side effects of H_2-receptor antagonists noted in the elderly include confusion, depression, and hallucinations. Potentially hazardous interactions of cimetidine reported in the British National Formulary include increased plasma concentration of a number of anti-arrhythmics, warfarin, and nicoumalone enhancement; inhibited metabolism (i.e., increased concentration) of antiepileptics (e.g., phenytoin, carbamazepine, valproate); possible increases in cyclosporin levels; and increased plasma theophylline level. Cimetidine also interacts with some tricyclic antidepressants, antidiabetics, antipsychotics, benzodiazepines, and beta-blockers. A study of Australian veterans identified cimetidine use in combination with benzodiazepines, tricyclic antidepressants, theophylline, and carbamazepine (Parkes & Cooper, 1997). Although the benefits usually outweigh the risks, the total clinical and pharmacological situation needs to be carefully considered. OTC drugs have to be treated with the same caution and respect as prescription-only medications.

U.S. Food and Drug Administration (FDA) OTC drug categories include allergy treatments, analgesia and antipyretic products, antimicrobials, bronchodilators, dermatological products, emetics, hematinics, laxatives, sedatives, stimulants, vitamin-mineral supplements, and weight-loss aids. The OTC drugs used most commonly by the elderly tend to be drugs for the treatment of pain and fever, coughs, colds, or allergy; insomnia; heartburn and acid reflux; constipation; diarrhea; and nausea and vomiting.

These drugs tend to be used to treat symptoms. However, they may mask a more serious pathology. Although OTC drugs are usually sold with clear warnings on the labels about the need to consult a medical practitioner if symptoms persist, the patient or family may equate controlling symptoms with treating the underlying disease. Late presentation for diagnosis or reduced compliance with prescribed medications can result. To illustrate some of the issues surrounding OTC drugs and polypharmacy in the elderly, delirium and adverse effects of antacids are considered in more detail.

Delirium

The contribution of prescription drugs to confusion and delirium in the elderly is well recognized, but the role of OTC medications is less appreciated. OTC drugs may contribute to the development of delirium through their direct actions or by interaction with other drugs (Flaherty, 1998).

OTC analgesics such as the salicylates, ibuprofen, and paracetamol (i.e, acetaminophen) can cause delirium in the elderly as a result of chronic use or taking a large dose (Grigor, Spitz, & Furst, 1987). OTC medications for insomnia can also cause problems because many of these products contain sedating antihistamines such as diphenhydramine or doxylamine, alone or in combination with an analgesic. In some countries, preparations containing hyoscine (i.e., scopolamine) are available as OTC sleep aids, as well as for motion sickness. Some herbal medicines may contain atropine and hyoscine. Antihistamines cause confusion at high doses after the first dose in susceptible elderly patients.

Perhaps the area of greatest concern is the proliferation of combination preparations for coughs, colds, and allergies. These preparations may contain many different ingredients, including antihistamines, sympathomimetics, analgesics, and expectorants. Mental status changes after the use of such preparations, including those designed for nasal inhalation, have been reported (Brown, Golden, & Evans, 1990; Snow, Logan, & Hollender, 1980). A study of the psychiatric side effects of phenylpropanolamine (now banned in the United States) in 37 cases found more reactions with self-medication than occurred when the same drug was prescribed by a medical practitioner (Lake, Mason, & Quirk, 1988). Numerous authors have suggested that every drug has the potential to cause delirium in the elderly. The active ingredients of an OTC drug need consideration when reviewing a patient's medications.

Antacids

Drug-induced malnutrition is an underappreciated aspect of OTC medications. Authors such as Roe (1984) suggest that excessive consumption of OTC drugs such as antacids and laxatives is the most significant cause of drug-induced malnutrition. All antacids can interact with other drugs, including antidepressants, antibiotics, cardiac glycosides, antipsychotics, and antiepileptics. Antacids may impair absorption; some attack the enteric coatings on pills, exposing the drug to gastric acids.

Antacids may be prescribed but more commonly they are used as self-medications to cope with nonspecific gastrointestinal symptoms such as indigestion, gas, flatulence, bloating, acid reflux, gastrointestinal discomfort, and heartburn. Antacids are used to treat epigastric symptoms of gastrointestinal or cardiovascular origin. Dyspepsia typically presents as heartburn or food-induced discomfort (indigestion), is often of uncertain origin, and may cause little concern. More serious underlying causes include hiatus hernia, peptic or esophageal ulcer, esophageal sclerosis, alcoholic gastritis, angina, congestive heart failure, and dyspnea due to emphysema (Roe, 1984).

Antacids are often aluminum or magnesium compounds that may be taken in liquid or chewable tablet form; relief lasts 3 to 4 hours. Aluminum-based antacids have a tendency to cause constipation; magnesium-based products tend to have laxative effects. Aluminum and magnesium compounds are contraindicated in patients with impaired renal function. Aluminum can be absorbed from the gastrointestinal tract; evidence suggests greater retention in renal impairment. Magnesium overload is reported in patients with renal failure using magnesium-based antacids. Hypophosphatemia is a possible consequence of excessive use of both aluminum and magnesium hydroxide antacids—a problem that may be underreported due to its insidious development and the tendency to ascribe symptoms to other aging-related changes (Roe, 1984).

Folate malabsorption is another possible adverse effect of antacid use in the elderly, although the evidence is not strong. An interaction between excessive intake of milk and antacids, the milk-alkali syndrome, has also been described. Elderly patients, particularly those with renal impairment, are at risk. Hypercalcemia occurs without accompanying hypercalciuria or hyperphospaturia. General symptoms include nausea, vomiting, anorexia, headache, and weakness. Calcium deposition in the cornea can cause band keratitis. Sodium bicarbonate used in excess can cause alkalosis and sodium overload, a particular risk with preexisting heart disease.

Although the news media overstate the case that some OTC drugs are killers, it is clear that OTC drugs are not innocuous; they have the same potential to cause harm as prescribed drugs. The problem of polypharmacy and reducing the negative effects of drugs in the elderly requires a full assessment of both prescribed and OTC drugs. Clinician review and careful education of the patient and family are necessary to ensure the correct use of all drugs.

COLIN TORRANCE

See also

Cough
Heartburn
Medication Adherence
Polypharmacy: Drug–Drug Interactions

Internet Resources

American Geriatrics Society
http://www.americangeriatrics.org/

National Council on Aging and the Quigley Corporation
http://www.senior-med-safety.com/

Medline Plus
http://www.nlm.nih.gov/medlineplus/overthecountermedicines.html

REFERENCES

Brown, T. M., Golden, R. N., & Evans, D. L. (1990). Organic affective psychosis associated with the routine use of non-prescription cold preparations. *British Journal of Psychiatry*, *156*, 72–75.

Flaherty, J. H. (1998). Commonly prescribed and over-the-counter medications: Causes of confusion. *Clinics in Geriatric Medicine*, *14*(1), 101–127.

Grigor, R. R., Spitz, P. W., & Furst, D. E. (1987). Salicylate toxicity in elderly patients with rheumatoid arthritis. *Journal of Rheumatology*, *14*(1), 60–66.

Lake, C. R., Mason, E. B., & Quirk, R. S. (1988). Psychiatric side effects attributed to phenylpropanolamine. *Pharmacopsychiatry*, *21*(4), 71–181.

Parkes, A. J., & Cooper, L. C. (1997). Inappropriate use of medications in the veteran community: How much do doctors and pharmacists contribute. *Australian and New Zealand Journal of Public Health*, *21*(5), 469–476.

Roe, D. A. (1984). Adverse nutritional effect of OTC drug use in the elderly. In D. A. Roe (Ed.), *Drug and Nutrition in the Geriatric Patient*. New York: Churchill Livingstone.

Simons, L. A., Tett, S., Simons, J., Lauchlan, R., McCallum, J., Friedlander, Y., et al. (1992). Multiple medication use in the elderly: Use of prescription and non-prescription drugs in an Australian community setting. *Medical Journal of Australia*, 157, 242–246.

Snow, S. S., Logan, T. P., & Hollender, M. H. (1980). Nasal spray "addiction" and psychosis: A case report. *British Journal of Psychiatry*, 136, 297–299.

P

PACE: PROGRAM OF ALL-INCLUSIVE CARE FOR THE ELDERLY

See

Program of All-Inclusive Care for the Elderly (PACE)

PAIN: ACUTE

Introduction

Acute pain is increasingly prevalent in older adults, and inadequate pain management is a significant problem, especially for hospitalized patients (Herr et al., 2004). Both age-related physiological changes and co-morbid diseases increase the risk of deleterious outcomes from unrelieved acute pain, such as pulmonary complications (e.g., atelectasis and pneumonia), decline in physical function, and thromboembolic events. Poorly controlled postoperative pain is associated with increased hospital stays, delayed healing, cognitive impairment, depression, and diminished activities of daily living (Bardiau, Taviaux, Albert, Boogaerts, & Stadler, 2003). Severe pain compromises the ability to perform self-care activities and maintain the responsibilities of independent living. Untreated pain from acute tissue injury (e.g., surgery, procedures, trauma) also leads to chronic pain states by evoking long-lasting disruptions in the neuromodulation of pain through the central nervous system.

The prevalence of acute pain among older adults has not been adequately characterized. Surgery, hip and long-bone fractures, compression fractures, exacerbations of rheumatoid arthritis, herpes zoster, and peripheral neuropathy (often associated with diabetes) can lead to acute pain. Chronic health problems are often sources of daily discomfort, which can involve both acute pain (characterized by sudden onset, obvious pathology, and usually less than 3 months' duration) and persistent chronic pain of longer duration. Osteoarthritis, the most common long-term painful condition in older adults, is characterized by episodes of both acute and chronic pain. Sudden and unpredictable atypical chest, jaw, or arm pain can occur with cardiac problems. Chronic diseases that compromise circulation, such as atherosclerosis and diabetes, result in peripheral vascular and acute ischemic pain. Studies show that not only do a large number of older adults suffer needless pain while in the hospital but also many are discharged with pain still poorly controlled (Park, Delaney, Maas, & Reed, 2004).

Age-related biological and psychosocial factors greatly influence the perception and response to pain. For example, a woman with osteoporosis can fracture a rib with a vigorous sneeze or cough and present with sudden point tenderness. Slowed neurological function with age can alter the nociceptive, or sensing, component of pain, leading to delayed discomfort, particularly in the case of trauma. It is not uncommon for older adults to experience a traumatic injury but fail to report pain until hours or even days after the event. Emotional states such as anxiety, fear, and worries about losing independence have a profound impact on how patients cope with pain.

Co-morbid conditions, preexisting chronic-pain states, complex pharmacological regimens, and cognitive impairment complicate the assessment of acute pain in older adults. Differentiating acute from chronic pain in older adults using existing scales is challenging; most pain-assessment scales generally quantify pain intensity and do not distinguish sources and patterns of acute pain. Although sometimes present with acute pain, autonomic responses such as tachycardia, elevated or depressed blood pressure, diaphoresis, and pupillary changes are not always reliable indicators.

About 60% of patients hospitalized with hip fractures experience some degree of cognitive impairment (Herr et al., 2004). Both acute confusion and chronic cognitive impairment are significant problems among elderly surgical patients, and they can impair the older adult's ability to localize, interpret, or communicate discomfort to caregivers.

Comprehensive tools such as the Brief Pain Inventory (BPI), which measures multiple dimensions of pain (i.e., intensity, relief, and pain interference with daily living), have been validated with older adults (Zalon, 2004). Pain flow sheets offer ways to monitor and document changes in behaviors in patients who cannot communicate by observing for facial grimacing, splinting or guarding of painful areas, and reluctance to move or decline in activity.

Structured questions about pain history, including duration, situations, or factors that increase or lessen pain and strategies used to manage pain (including nonprescription medications and complementary or alternative therapies) can be used to obtain information about a patient's pain. The effectiveness of each treatment strategy and the individual's daily routine for managing acute pain should be documented in the assessment. The onset of pain should be differentiated from preexisting chronic pain by the duration, pattern, and precipitating factors.

Multimodal Approach to Pain Management

New treatment paradigms such as multimodal therapy, which combines analgesics with synergistic or additive effects and different actions on targets in the peripheral and central nervous system, have evolved to improve pain control. Advantages of multimodal therapy include dose reductions of analgesics, decreased side effects, and improved pain relief. Analgesic regimens should be designed to prevent "analgesic gaps" that can occur at various times when (1) there are interruptions in analgesic therapy (e.g., transfers between services/hospital locations, transitions from one medication route to another such as switching from epidural to intravenous or intravenous to oral therapy, or lapses or delays in medication administration); or (2) pain is exacerbated (during and following procedure and with activity (e.g., getting out of bed, physical therapy).

The treatment of pain in older adults can be affected by a decline in organ-system functions resulting in atypical responses to analgesic medications. Overall, older adults are more sensitive to the cognitive and sedating effects of opioid analgesics and are more likely to experience constipation and urinary retention. They are also more susceptible to the hepatic toxicity from acetaminophen and gastrointestinal and renal toxicity from nonsteroidal anti-inflammatory drugs (NSAIDs). Standard analgesics used to treat acute mild to moderate pain include acetaminophen, NSAIDs, nonopioid and opioid combinations (i.e., acetaminophen plus tramadol, acetaminophen plus codeine, acetaminophen plus hydrocodone, and acetaminophen plus oxycodone). Hepatotoxicity can occur with doses of acetaminophen in excess of 4,000 mg per day; gastric bleeding, renal impairment, and platelet dysfunction are associated with the use of some NSAIDs. More potent oral opioids (e.g., oxycodone, morphine, and transdermal fentanyl [Duragesic]) can be given for more moderate to severe pain. Adverse effects from opioid analgesics include increased constipation and sedation and more seriously altered mental status that can lead to falls and respiratory depression. The American Geriatrics Society recommends a "start low and go slow" approach. Evidence-based guidelines (http://www.guideline.gov) are available to assist clinicians with selecting appropriate analgesics, determining usual starting doses, and monitoring adverse effects (Ardery Herr, Titler, Sorofman, & Schmitt, 2003).

Intravenous patient-controlled analgesia (PCA) is safe and effective for older adults. Innovations in technology include a new transdermal fentanyl PCA system that will soon be available (Lavand'Homme & De Kock, 1998; Miaskowski, 2005). Older adults are more likely to experience higher analgesic peaks, longer duration of action, and increased side effects; therefore, continuous background or basal infusion should not be use in opioid-naïve patients until opioid requirements and response to therapy are apparent. Morphine and hydromorphone (i.e, Dilaudid) are opioids of choice, and the incidence and severity of side effects such as nausea, mood disturbances, and unusual dreams appear to be similar. Meperidine (i.e., Demerol) is no longer recommended for postoperative pain control and is definitely contraindicated for older adults because its active metabolite normeperidine accumulates with repeated doses. Morphine also has active metabolites that can reach toxic levels, but this is rarely a problem with PCA of short duration. The initial starting dose of morphine for opioid-naïve patients is 0.5 to 1 mg IV PCA demand or self-administered dose every 10 to 15 minutes, and hydromorphone 0.2 mg demand dose every 10 to 15 minutes. IV PCA with fentanyl is an alternative for patients with renal impairment, unmanageable nausea and vomiting, or other adverse effects from morphine or hydromorphone; dosing parameters should be established with input from a pain expert.

Verbal and written information should be provided prior to and after surgery to emphasize the principles of PCA therapy, the need to self-medicate before the pain worsens, and the importance of reporting unrelieved pain. Older patients may require more reinforcement of teaching to alleviate concerns of addiction and fear of administering too much.

Patient-controlled epidural analgesia (PCEA) is associated with improved pain relief at rest and with coughing, earlier return of bowel function, and greater patient satisfaction compared to intravenous PCA in older populations (Mann et al., 2000). A combination of an opioid (e.g., morphine or fentanyl) and a local anesthetic (e.g., bupivacaine or ropivacaine) is routinely administered by continuous infusion, although either may be administered alone. Fentanyl, because of less rostral (i.e., vertical) spread to higher levels of the central nervous system, is preferred over morphine to reduce the risk of respiratory depression, especially for patients with preexisting pulmonary disease. Local anesthetics such as bupivacaine that affect sensory and motor neurons are associated with a greater incidence of orthostatic hypotension and lower motor weakness than are anesthetics selective for sensory nerves, such as ropivacaine. Intermittent bolus injections of epidural morphine or the longer-acting local anesthetic lidocaine, for example, can be administered. There is an increased risk of respiratory depression with concurrently administered of epidural and systemic opioids. Altered cognitive status and urinary retention are also potential adverse effects of epidural analgesia. Patients receiving epidural therapy should be regularly monitored with hourly respiratory rates for the first 24 hours. Lower concentrations of a local anesthetic can be administered to limit the incidence and severity of orthostatic hypotension and lower motor weakness. Patients receiving a local anesthetic need assistance getting out of bed or ambulating, especially for the first 24 hours. Frequent repositioning is necessary to prevent pressure ulcers and to maintain circulation because patients may experience a decrease in sensation.

Transitions in Care

Park, Delaney, Maas, & Reed (2004) found that more than 30% of older patients experienced troublesome pain following hospital discharge. Older adults and their caregivers are often inadequately prepared to deal with posthospital needs; acute pain is frequently a problem after discharge and can prompt additional telephone calls and outpatient visits. Shorter hospitalizations have placed tremendous pressure on expediting discharge with insufficient time to evaluate analgesic regimens and teach patients about their medications and other pain-relieving methods. Nevertheless, realistic goals for pain control should be established, and patients should be instructed to report increased levels of pain and any adverse effects of analgesics. Discharge instructions should stress expectations for pain relief, considering that pain may not steadily decline but could worsen with increased activity. Specific dosing guidelines for analgesics should be reviewed along with measures to manage side effects such as constipation from opioids. Patients should receive information regarding alternative methods of pain control, such as heat, massage, relaxation, proper alignment of body parts, and scheduling of alternating periods of rest and activity.

Home-health-nursing visits should be ordered to monitor pain levels and assess the response to analgesic therapy. If resources are available to help older adults with activities of daily living, a home-health aide might reduce physical exertion that can exacerbate pain. Scheduling activities and structuring the environment to place minimal demands on an older adult with acute pain can conserve energy and promote recovery.

ROSEMARY C. POLOMANO
LISETTE BUNTING-PERRY

Internet Resources

American Geriatrics Society
http://americangeriatrics.org

American Pain Society
http://www.ampainsoc.org

American Society for Pain Management Nurses
http://www.aspmn.org

Geriatric Nursing Resources for Care of Older Adults, GeronurseOnline.org
http://www.geronurseonline.org

International Association for the Study of Pain
http://www.iasp-pain.org

Purdue Pharma L.P.
http://www.partnersagainstpain.com

Wisconsin Pain Initiative
http://www.aacpi.wisc.edu/wcpi

REFERENCES

Ardery, G., Herr, K. A., Titler, M. G., Sorofman, B. A., & Schmitt, M. B. (2003). Assessing and managing acute pain in older adults: A research base to guide practice. *Medsurg Nursing*, *12*, 7–18.

Bardiau, F. M., Taviaux, N. F., Albert, A., Boogaerts, J. G., & Stadler, M. (2003). An intervention study to enhance postoperative pain management. *Anesthesia & Analgesia*, *96*, 179–185.

Herr, K., Titler, M. G., Schilling, M. L., Marsh, J. L., Xie, X., Ardery, G., et al. (2004). Evidence-based assessment of acute pain in older adults: Current nursing practices and perceived barriers. *Clinical Journal of Pain*, *20*, 331–340.

Lavand'Homme, P., & De Kock, M. (1998). Practical guidelines on the postoperative use of patient-controlled analgesia in the elderly. *Drugs Aging*, *3*(1), 9–16.

Mann, C., Pouzeratte, Y., Boccara, G., Peccoux, C., Vergne, C., Brunat, G., et al. (2000). Comparison of intravenous or epidural patient-controlled analgesia in the elderly after major abdominal surgery. *Anesthesiology*, *92*(2), 433–441.

Miaskowski, C. (2005). Patient-controlled modalities for acute postoperative pain management. *Journal of Perianesthesia Nursing*, *20*(4), 255–267.

Park, M., Delaney, C., Maas, M., & Reed, D. (2004). Using a nursing minimum data set with older patients with dementia in an acute care setting. *Journal of Advanced Nursing*, *47*(3), 329–339.

Zalon, M. L. (2004). Correlates of recovery among older adults after major abdominal surgery. *Nursing Research*, *53*(2), 99–106.

PAIN ASSESSMENT INSTRUMENTS

Assessment of pain for older adults is an essential part of pain management. Failure to ask about or detect pain places older clients at risk for undertreatment of pain and has the potential to negatively impact elders' health, functioning, and quality of life (American Geriatrics Society [AGS], 2002; Horgas & Elliott, 2004). Effective pain management involves thorough assessment to understand the type of pain (e.g., acute or persistent) and cause of the pain (e.g., nociceptive or neuropathic) and to develop an appropriate treatment strategy. Because there are no objective biological markers of pain, the patient's self-report is the most reliable and accurate method of assessing pain (AGS, 2002). Thus, McCaffery's classic definition of pain remains relevant: "Pain is whatever the experiencing person says it is, existing whenever s/he says it does" (McCaffery & Pasero, 1999).

Pain is a multidimensional, subjective experience with sensory, cognitive, and emotional dimensions (AGS, 2002). Few assessment tools, however, evaluate all of the different dimensions of pain. The most notable exception is the McGill Pain Questionnaire (MPQ), which measures pain affect and evaluation (based on 78 word descriptors), pain location (using a body map), and pain intensity (based on the Present Pain Intensity [PPI] subscale, a single question rating subjective pain on a 6-point scale). Although the PPI can be used separately, the entire measurement tool may be too time-intensive for use with older adults.

Intensity is the most commonly assessed aspect of pain and is often measured using a numeric rating scale (NRS), the verbal descriptor scale (VDS), or the faces pain scale (FPS). The NRS is widely used, especially in hospital settings. Patients are asked to verbally rate the intensity of their pain on a 0-10 scale. The NRS requires the ability to discriminate subtle differences in pain intensity and may be difficult for some elders to complete, particularly those with hearing loss or cognitive deficits.

The VDS is an alternative measure recommended for use with elderly adults (Herr, 2002). This tool measures pain intensity by asking participants to select a word that best describes their present pain (e.g., no pain to worst pain imaginable). This measure has been found to be a reliable and valid measure of pain intensity and is reported to be the easiest to complete and the most preferred by older adults (Herr, 2002). In addition, there are several scales that use pictures of faces to represent pain intensity. This type of measure is often recommended for use with cognitively impaired elders. The FPS for use in the adult population (Bieri, Reeve, Champion, Addicoat, & Ziegler, 1990) consists of seven cartoon facial depictions ranging from the least pain to the most pain possible and is considered appropriate for use with elderly adults because the cartoon faces are not age-, gender-, or race-specific. Several studies have compared the FPS and other tools (i.e., VDS, Pain Intensity Number Scale, Iowa Pain Thermometer, and NRS) for the assessment of current and recalled pain in older adults, and reported favorable results.

Regardless of the measure used, there is evidence that older adults often underreport the presence of pain (AGS, 2002). Some reasons for this are the belief that pain is a normal part of aging, concern about being labeled a complainer, fear of the meaning of the pain in relation to disease progression or prognosis, fear of narcotic addiction and analgesics, and worry about health care costs (AGS, 2002). Other factors, such as hearing and speech difficulties, may prevent elderly adults from communicating pain to health care providers. Further, cognitive impairment is an important factor in reducing elders' reporting of pain (Horgas & Elliott, 2004).

The assessment of pain behaviors is often necessary in elders, especially in those who are unable to verbally report their pain due to dementia. Deficits such as compromised cognitive and verbal skills (i.e., memory loss, loss of judgment, confusion, and attention and language deficits) make it difficult for persons with cognitive impairments to recall and/or express pain.

Several researchers have developed methods to directly observe for pain behaviors (Feldt, 2000; Hurley, Volicer, Hanrahan, House, & Volicer, 1992; Snow et al., 2004). These methods include observing for behaviors such as guarded movement, bracing, rubbing the affected area, grimacing, painful noises or words, and restlessness. For instance, Hurley and colleagues developed the Discomfort Scale-DAT to assess discomfort in persons with advanced Alzheimer's disease (Hurley et al., 1992). They identified nine indicators of discomfort associated with fever: noisy breathing, absence of a look of contentment, looking sad, looking frightened, frowning, absence of a relaxed body posture, looking tense, and fidgeting. This measure, however, requires significant training and may be too complex for routine nursing care. Feldt and colleagues developed the Checklist for Nonverbal Pain Behaviors to assess the presence of six pain behaviors during rest and movement. This tool is based on naturalistic observations of hospitalized elders, has shown high inter-rater reliability (i.e., 93% agreement; Kappa = 0.63–0.82), and is positively associated with self-reports of pain (Feldt, 2000). More recently, Snow and colleagues developed the NOPPAIN scale for assessing pain in noncommunicative nursing-home residents (Snow et al., 2004). The NOPPAIN is used by certified nursing assistants to rate the presence and

TABLE P.1 Advantages and Disadvantages of Pain Assessment Instruments

Instrument	Advantages	Disadvantages
McGill Pain Questionnaire (MPQ)	Comprehensive measure contributes to thorough pain assessment Tool has established reliability in diverse populations of older adults	Lengthy instrument; older adults may become fatigued during the assessment.
Numeric Rating Scale (NRS)	Ease of administration Older adult is asked to verbally rate pain on 1-10 scale Widely used in most clinical settings	May be difficult for some elders to use, particularly those with hearing, communication, or cognitive deficits.
Verbal Descriptor Scale (VDS)	Can be administered as paper and pencil or verbal scale Has accepted validity in older adults Easy to use and preferred by older adults	Difficult to compare pain intensity ratings obtained with VDS to other ratings (NRS).
Faces Pain Scale (FPS)	Easy to use, especially in older adults with cognitive deficits Has good psychometric properties when used with cognitively intact older adults and postoperative speech- impaired older adults	Evidence for reliability and validity in diverse populations is limited
Observed Pain Behaviors	Direct observation of pain behavioral indicators while person performs pain-inducing tasks (with movement and at rest) Has demonstrated reliability and validity in cognitively intact older adults	Focuses on obvious behavioral indicators and does not address the more subtle cues of pain in older adults (e.g., change in interpersonal interactions, activity patterns, and mental status) (AGS, 2002)
Non-Communicative Patients' Pain Assessment Instrument (NOPPAIN)	Brief measure Easy to use by clinicians Minimal training required	Scoring procedures are not clear No criteria to establish high and low intensity of pain behavior Does not address subtle cues of pain (AGS, 2002)
Discomfort with Dementia of the Alzheimer's Type (DS-DAT)	Appropriate for assessing pain in patients with Alzheimer's disease	Requires extensive training to use measure reliably. Does not address subtle cues of pain (AGS, 2002)

intensity of pain among residents following usual care activities. The results of preliminary studies testing the NOPPAIN indicate that it is reliable and valid but that further testing is needed in different clinical settings. Taken together, there are several tools available to measure behavioral indicators of pain, but all of them need further development and testing before they can be adopted for widespread use in clinical practice (Herr, Bjoro, & Decker, 2006).

In summary, pain is a complex experience that requires careful assessment in order to effectively manage it. There are a number of different pain measures that can be used with older adults, including subjective measures of self-reported pain as well as objective measures of pain-related behaviors and pain indicators. There is no one best measure of pain. Rather, it is recommended that the pain measure be selected that best fits the patients' physical, emotional, and cognitive abilities; the setting; and the situation. The most important recommendation for measuring pain in older adults is for clinicians to use a standardized pain assessment tool and to apply it consistently in assessing patient's pain and in evaluating the effectiveness of pain-management strategies.

Ann Horgas
Amanda Floetke Elliott
Carmen Rodriguez

See also
Back Pain
Pain: Acute, Chronic

Internet Resources

American Geriatrics Society
http://www.medscape.com/viewarticle/437463_6

American Pain Society
http://www.ampainsoc.org/decadeofpain/clinician/clinician1.htm

City of Hope Beckman Research Institute
http://www.cityofhope.org/prc/elderly.asp

International Association for the Study of Pain
http://www.iasp-pain.org/subjind.html

National Guideline Clearinghouse
http://www.guideline.gov/summary/summary.aspx?ss=15&doc_id=6667&nbr=4177

Try This
http://www.hartfordign.org/resources/education/tryThis.html

REFERENCES

American Geriatrics Society (2002). The management of persistent pain in older adults: AGS panel on persistent pain in older adults. *Journal of the American Geriatrics Society*, *50*, S205–S224.

Bieri, D., Reeve, R. A., Champion, G. D., Addicoat, L., & Ziegler, J. B. (1990). The Faces Pain Scale for the self-assessment of the severity of pain experienced by children: Development, initial validation, and preliminary investigation for ratio scale properties. *Pain*, *41*, 139–150.

Feldt, K. S. (2000). The Checklist of Nonverbal Pain Indicators (CNPI). *Pain Management Nursing*, *1*(1),13–21.

Herr, K. (2002). Chronic pain: Challenges and assessment strategies. *Journal of Gerontological Nursing*, *28*(1), 20–27.

Herr, K., Bjoro, K., & Decker, S. (2006). Tools for assessment of pain in nonverbal older adults with dementia: A state-of-the-science review. *Journal of Pain and Symptom Management*, *31*(2), 170–192.

Horgas, A. L., & Elliott, A. F. (2004). Pain assessment and management in persons with dementia. *Nursing Clinics of North America*, *39(3),* 593–606.

Hurley, A. C., Volicer, B. J., Hanrahan, P. A., House, S., & Volicer, L. (1992). Assessment of discomfort in advanced Alzheimer's patients. *Research in Nursing and Health*, *15(5)*, 367–377.

McCaffery, M., & Pasero, C. (1999). *Pain: Clinical manual* (2nd ed.). St. Louis, MO: Mosby Company.

Snow, A. L., Weber, J. B., O'Malley, K. J., Cody, M., Beck, C., Bruera, E., et al. (2004). NOPPAIN: A nursing assistant–administered pain assessment instrument for use in dementia. *Dementia and Geriatric Cognitive Disorders, 17*, 240–246.

PAIN: CHRONIC/PERSISTENT

Chronic pain, defined as pain lasting for 3 months or more, is considered persistent pain in the older adult population. The term *persistent pain* is used to eliminate the negative stereotypes of addiction, malingering, and drug-seeking behaviors that are often associated with chronic pain and to diminish barriers that interfere with the management of pain (American Geriatric Society Panel on Persistent Pain in Older Adults, 2002). Chronic pain is one of the most pervasive yet undertreated problems in older adults. Physiological changes of aging, sensory deficits, cognitive impairment, and underreporting of pain complicate the recognition and treatment of painful conditions in this vulnerable population.

Unrelieved pain results in depression, decreased socialization, sleep disturbances, impaired ambulation, and increased health care utilization and costs. The detection and management of pain must include routine pain assessment and reassessment, careful use of analgesic drugs, and nonpharmacological interventions such as physical therapy and nontraditional approaches.

Definitions

Persistent pain in older adults can be categorized as (1) nociceptive, (2) neuropathic, and (3) mixed or unspecified pain. *Nociceptive pain* is defined as a normal sensory process that is caused by stimulation of pain receptors in response to inflammation, tissue destruction, or ongoing injury. Examples of nociceptive pain include nonmalignant pain from musculoskeletal problems such as osteoporosis or arthritis, peripheral vascular disease, myofascial pain syndromes, back pain, and fibromyaligia, as well as pain involving viscera, organs, or the lining of the body cavities. Cancer-related pain such as bony or organ metastasis is also caused by activation of nociceptors.

Neuropathic pain is an abnormal response to pain stimuli resulting from damage to the central and peripheral nervous systems. Neuropathic pain syndromes include post-stroke thalamic pain and pain from neurodegenerative disorders such as Parkinson's disease, multiple sclerosis, spinal-cord injury, and cancer. Examples of peripheral neuropathic pain are postherpetic neuralgia, phantom limb pain, chemotherapy-induced neuropathy, and diabetic neuropathy (American Medical Association, 2003). Older adults may also experience mixed or unspecified pain of unknown or unclear origin, which can be difficult to assess and require multiple trials of pain-relieving modalities (American Geriatric Society Panel on Persistent Pain in Older Adults, 2002).

Pain Estimates in Older Adults

Chronic pain in older adults is a major public health problem, and its incidence and prevalence is of considerable concern. Chronic pain occurs in up to 50% of community-dwelling older adults, 80% of long-term-care residents, 45% of hospitalized older adults in acute settings, and 70% of patients in critical-care units (Graf & Puntillo, 2003). Chronic activity-limiting pain has been identified in 37% of older adults living in retirement-care communities. Significant relationships exist among chronic pain, increased depression, and increased utilization of health resources (Mossey & Gallagher, 2004) and, unfortunately, chronic pain contributes to significant morbidity and mortality.

Chronic Pain Assessment

Current literature on the assessment of pain in older adults incorporates the evaluation of cognitive function to guide clinicians in selecting the most appropriate pain measures. Because pain is a subjective experience, a thorough pain history should include location, onset, duration, pattern, intensity, character and quality, and aggravating factors (e.g., movement, positioning, stressful events). Pain interference with sleep, eating, mood, social activities, relationships, and other aspects of quality of life should be assessed. A thorough health history is used to identify both medical and psychiatric comorbidities that may exacerbate pain. A physical examination can provide additional information about pain locations, sensory disturbances associated with neuropathic pain, visual signs of swelling, limited range of motion, pain on palpation, and evoked pain or tenderness at trigger points (American Medical Association, 2003).

Because there are no objective biological markers of pain, self-report is the most effective method for information gathering regarding pain. Numerous patient-reported assessment scales are available to obtain objective measures of persistent pain; however, it is important to select appropriate pain measures that are interpretable and easy to use. Unidimensional scales for pain intensity include visual analog scales (0 to 100 mm line scale), Numeric Rating Scale (0 no pain to 10 worst or unbearable pain), verbal descriptive scales (VDSs) with categories (no pain, mild, moderate, or severe pain), and Adult Faces Rating Scale (AFRS). The Brief Pain Inventory (BPI)–Short Form is a multidimensional tool that evaluates dimensions of pain intensity (present, average, worst, and least pain), location, pain relief, and pain interference with general activity (i.e., mood, walking ability, normal work, relationships with others, sleep, and enjoyment of life). In addition, the presence of pain can affect an older adult's ability to process and retain information.

Older adults with cognitive impairment (CI) may be unable to provide reliable estimates of pain, and alternative approaches such as behavioral observations should be considered. Recently published guidelines are available to assist with the clinical assessment of pain in older adults who are CI secondary to disorders such as Alzheimer's disease, Lewy body dementia, and delirium (Herr, Bjoro, & Decker, 2006a).

To assess pain in CI older adults, the same general principles for obtaining a health history and conducting a physical examination apply. Older adults with mild to moderate CI may be able to accurately self-report pain intensity with the aid of AFRS and VDS scales and associated symptoms as well as cooperating with a physical examination. For those individuals who are unable to verbalize or express pain and symptoms, it may be necessary to rely on a health history and physical examination alone. Past or current health problems can provide information about painful diseases or conditions. Obtaining information from a reliable source on falls or injuries can also yield important findings. Causes of acute pain should also be considered in the differential diagnosis, such as upper respiratory and urinary tract infections (Herr et al., 2006b). Common pain behaviors in older adults with CI include sad, frightened, and grimacing facial expressions; moaning, groaning, or verbally abusive language; guarded or rigid posture; rocking or pacing; diminished mobility; decreased socialization; socially inappropriate or aggressive behavior; diminished appetite; and increased or decreased sleep (American Geriatric Society Panel on Persistent Pain in Older Adults, 2002). A review of pain assessment instruments for nonverbal older adults with CI has been published with criteria to determine the most appropriate methods for assessing pain (Herr et al., 2006b).

Management of Persistent Pain

Managing persistent pain in an older adult often requires a combination of both pharmacologic and nonpharmacological approaches. The goal of therapy is to relieve pain and suffering, restore function, and improve quality of life, which can be gauged by the ability to maintain an optimal level of self-care and participation in social activities.

Pain management is complicated by adverse drug reactions and sensitivity to analgesics. Safe, effective analgesic therapy requires in-depth knowledge of age-related changes in pharmacokinetics and pharmacodynamics. Fine (2004) outlines the critical changes that occur with aging that must be considered when selecting analgesics and titrating doses. These include body composition (i.e., fat to muscle mass changing distribution of drugs), GI motility (i.e., decreases, leading to longer transit times), cardiac output (i.e., decreases, leading to longer circulation, uptake, and distribution times), renal clearance (i.e., decreases, leading to accumulation of active drug or metabolites), protein binding (i.e., decreases, resulting in available of drug), and central nervous system (i.e., increased susceptibility to sedation and altered mentation). The general rule is to "start low" with initial doses and "go slow" with titrating to therapeutic effect (American Geriatric Society Panel on Persistent Pain in Older Adults, 2002).

Nonopioid analgesics such as acetaminophen can be tried for mild to moderate pain, but caution should be used to avoid maximum daily doses of greater than 3 grams. Nonsteroidal anti-inflammatory drugs (NSAIDs) can be administered on an as-needed basis to treat pain of musculoskeletal or inflammatory origin. Short-acting opioid analgesics can be prescribed for moderate to severe pain (e.g., hydrocodone/acetaminophen combinations, oxycodone, morphine, and hydromorphone); however, these should be initiated at one-half the usual starting doses for adults. Patients must be monitored for sedation, changes in blood pressure and mentation, respiratory depression, fall risk, and opioid-induced constipation, which requires a bowel regimen with regular use of a laxative. Agents such as antidepressants and anticonvulsants should also be considered for neuropathic pain, and drugs with the lowest side-effect profile should be selected (Fine, 2004). A newer anticonvulsant, pregabalin, should be used with caution with older adults because dizziness and somnolence are common (Guay, 2005).

Nonpharmacological strategies in the management of persistent pain in older adults are often effective in conjunction with pharmacologic agents. Patient education, physical therapy, exercise groups, and cognitive behavioral therapy have all been used successfully in pain-management programs. Distraction, humor, massage therapy, therapeutic touch, acupuncture, and imagery provide alternative means for pain relief. Physical deconditioning that can occur with persistent pain may result in limited activity and loss of muscle mass; therefore, a structured physical therapy program helps to regain strength, balance, and flexibility. Cognitive-behavioral interventions foster new coping mechanisms and adaptation to limitations imposed by pain (American Geriatric Society Panel on Persistent Pain in Older Adults, 2002). Several reputable Web-based resources are available to health care professionals and clients, especially with palliative care and end-of-life care.

LISETTE BUNTING-PERRY
ROSEMARY C. POLOMANO

See also
Back Pain
Headache
Pain: Acute

Internet Resources

American Pain Society
http://www,ampainsoc.org

American Geriatrics Society
http://www.americangeriatrics.org

Medicine Health
http://www.emedicinehealth.com/chronic_pain/article_em.htm

National Institute for Neurological Disorders and Stroke
http://www.ninds.nih.gov/disorders/chronic_pain/chronic_pain.htm

U.S. Food and Drug Administration
http://www.fda.gov/fdac/features/2004/204_pain.html

REFERENCES

American Geriatric Society Panel on Persistent Pain in Older Adults (2002). The management of persistent pain in older persons. *Journal of the American Geriatrics Society*, *50* (6 Suppl.), S205–S224.

American Medical Association (2003). *Pain Management—the series: Part 3: Management of persistent nonmalignant pain*. Chicago: American Medical Association.

Deitrick, G. E., Timlin, A., Gardner, B., & Polomano, R. C. (2006). Palliative care and end-of-life care World Wide Web resources for geriatrics. *Journal of Pain, Palliative Care & Pharmacotherapy*, *20*, 47–56.

Fine, P. G. (2004). Pharmacological management of persistent pain in older patients. *Clinical Journal of Pain*, *20*(4), 220–226.

Graf, C., & Puntillo, K. (2003). Pain in the older adult in the intensive care unit. *Critical Care Clinics*, *19*(4), 749–770.

Guay, D. R. (2005). Pregabalin in neuropathic pain: A more "pharmaceutically elegant" gabapentin? *American Journal of Geriatric Pharmacotherapy*, *3*, 274–287.

Herr, K., Bjoro, K., & Decker, S. (2006a). Tools for assessment of pain in nonverbal older adults with dementia: A state-of-the-science review. *Journal of Pain and Symptom Management*, *31*(2), 170–192.

Herr, K., Coyne, P., Key, T., Manworren, R., McCaffery, M., Merkel, S., et al. (2006). Pain assessment in the nonverbal patient: Position statement with clinical practice recommendations. *Pain Management Nursing*, *7*(2), 44–52.

Mossey, J. M., & Gallagher, R. M. (2004). The longitudinal occurrence and impact of co-morbid chronic pain and chronic depression over two years in continuing care retirement community residents. *Pain Medicine*, *5*(4), 335–348.

PALLIATIVE CARE

The 20th century saw dramatic changes in the focus of health care. Advances in medical care, as well as in the fields of nutrition and public health, have led to longer life expectancy. Medical advances also have led to the institutionalization of illness and death. As people now live longer, they often experience multiple chronic or life-threatening diseases: heart disease, cancer, stroke, respiratory diseases, and progressive dementia. These life-threatening illnesses, which are often protracted and often involve chronic disability, have corresponding needs for assistance, symptom management, and hospice and palliative care services (Berry & Matzo, 2004).

Reports document the deficits that currently exist in end-of-life care. The large-scale national SUPPORT study (1995) documents that people have been dying with significant pain and other symptoms, in impersonal technological environments, and without their health care providers acknowledging their last wishes. Professional concern and public demand have resulted in the evolution of palliative care, a philosophy that emphasizes quality of life throughout the disease trajectory.

Palliative care aims to identify and address the physical, psychological, spiritual, and practical burdens of illness. The goal of palliative care is to prevent and relieve suffering and to support the best possible quality of life for patients and their families, regardless of the stage of the disease or the need for other therapies. Palliative care expands traditional disease-model medical treatments to include the goals of enhancing quality of life for patient and family, optimizing function, helping with decision making, and providing opportunities for personal growth. As such, it can be delivered concurrently with life-prolonging care or as the main focus of care (National Consensus Project, 2004).

The National Consensus Guidelines for Quality Palliative Care, released in 2004, were developed by a consortium of leading hospice and palliative-care organizations in the United States. This landmark document provides guidelines for the provision of palliative care and can be used as a framework to identify the domains of hospice and palliative care.

Structure and Processes

The guidelines call for care planned and delivered by an interdisciplinary team of health care professionals. Such a team typically includes physician, nurse (often in advanced practice), social worker, and chaplain. Ideally, collaboration with other disciplines would include the involvement of psychologists, pharmacists, nutritionists, rehabilitation specialists, and practitioners trained in complementary therapies. The program must maintain a strong partnership with community resources because palliative care is now offered in a variety of settings, such as in-patient units, ambulatory settings, community hospices, long-term-care settings, and assisted-living facilities.

Physical Aspects of Care

Pain management has always been a cornerstone of palliative care, yet research documents that pain in the elderly remains undertreated in many settings (Meier & Monias, 2005). Barriers to adequate pain management may be multifactorial and include the following: misperceptions about the nature of pain in the elderly, patient underreporting of pain, co-morbidities and cognitive losses that impede assessment, knowledge deficits on the part of care providers, and limited numbers of professional staff in long-term-care facilities (Pitorak & Montana, 2004).

The first step in the successful management of pain is accurate assessment. Because pain is a subjective experience, asking—and believing—the patient is most crucial. Use of a visual analogue scale (0-10 pain scale) and the incorporation of pain assessment as the fifth vital sign can ensure the consistent measurement of pain frequency and intensity. Pain assessment also includes the identification of the location, duration, and quality of the pain, as well as the exacerbating and alleviating factors, meaning of the pain, and its effect on activities of daily living (ADL) (Coyle & Layman-Goldstein, 2006). In the elder population, assessment can be complicated by coexisting cognitive impairment. Patients with mild impairment are often capable of reporting pain in the present moment. Pain in noncommunicative patients can be assessed through observation of body movement or with validated pain-assessment instruments such as the Checklist of Nonverbal Pain Indicators, which further assesses signs of pain such as grimacing, moaning, and restlessness (Pitorak & Montana, 2004).

The WHO analgesic ladder is acknowledged as the cornerstone of the pharmacologic management of pain. This ladder presents a three-step approach to address mild, moderate, and severe pain. Mild pain is treated with nonopioid and adjuvant medications; moderate pain is treated with low doses or weaker opioids in addition to Step I medications. For severe pain, strong opioids are used in increasing doses until relief or intolerable side effects develop (Pitorak & Montana, 2004).

This WHO ladder can be applied successfully to treat an older adult in pain, although some caution is warranted. Differences in drug distribution and metabolism may lead to a more profound analgesic effect or more side effects in the elderly. NSAIDs, for instance, should be used sparingly and with careful monitoring of renal and gastrointestinal status (Morrison & Meier, 2003). The "start low and go slow" philosophy is well suited to the pharmacologic treatment of pain in the elderly. Short-acting medications are more easily titrated, but once a stable dose is determined, longer-acting drugs can be used successfully if carefully monitored. As in all patients, meperidine is not recommended for chronic pain in the elderly due to the potential accumulation of its toxic metabolite, normeperidine.

The nonpharmacologic treatment of pain includes TENS (Transcutaneous electrical nerve stimulator), acupuncture, and physical therapy. Cognitive-behavioral techniques such as progressive muscle relaxation and guided imagery are complementary therapies that can be taught to involved caregivers. Other complementary therapies are music and art therapy, aromatherapy, massage, therapeutic touch, and the use of prayer and meditation (Pitorak & Montana, 2004). These complementary therapies are also being used to treat other distressful symptoms such as dyspnea, nausea, and anxiety.

Other Physical Symptoms

It is believed that the constellation of symptoms seen in dying older adults is somewhat different than younger patients; delirium, sensory impairment, incontinence, dizziness, cough, and constipation are more prevalent. On average, an older adult has 1.5 times more symptoms than a younger patient, and these symptoms last longer (Israel & Morrison, 2002). Dyspnea, the subjective feeling of breathlessness, can be a frightening symptom. Constipation is a nearly universal problem in ill older adults and can lead to severe complications if left untreated. Confusion, a debilitating symptom that may develop from many different etiologies, often leads to hospitalization or institutionalization. The goal is the prevention and early treatment of symptoms, eliminating the underlying cause, if possible. Care providers must avail themselves of the growing number of resources available to guide them in implementing effective pharmacologic, nonpharmacologic, and complementary interventions.

Psychological Aspects of Care

The suffering associated with chronic life-limiting illness is multidimensional. Suffering affects the mind and spirit as well as the body. Issues such as self-esteem disturbance, anxiety, depression, and grief from multiple losses (real and anticipated) are all areas of concern. Spiritual concerns and existential distress may also contribute to patient suffering. With careful consideration of the patient's cultural and spiritual background and through contributions from psychology, social work, and pastoral care, these needs can be addressed.

Social Aspects of Care

Social needs of patients and families include financial hardship and caregiver burden. Often the direct caregivers of these patients are elderly themselves, leading to significant personal and financial stress and consequent hospitalization or institutionalization. Interventions aimed at supporting direct caregivers can include psycho-educational programs (including support groups), increasing home-care services, using volunteers and respite care, and maintaining open and direct lines of communication.

Ethical–Legal Aspects of Care

The preferences and goals of patient and family must remain at the forefront of all care decisions. Advanced care planning includes two common forms of medical advance directives: the identification of a health care proxy and the determination of treatment preferences (often known as a living will). It is imperative to remember that treatment preferences are often influenced by cultural considerations. Furthermore, many older adults prefer family members to make decisions on their behalf, without completing written documents. The practitioner providing palliative care must be aware of local regulations that govern advance directives. Important also is a familiarity with common ethical issues that may arise in the care of dying elderly, such as withdrawing or withholding artificial nutrition, hydration, or ventilation; implementing Do Not Rescusitate (DNR) orders, and using palliative sedation at the end of life.

The Future of Palliative Care

In the past 10 years, palliative care has been rapidly growing as a specialty within several disciplines. An American Hospital Association survey indicates that during a 3-year period, there was 67% growth in hospital-based palliative-care programs, with 1,027 program reports in 2003.There has also been an associated increase in the number of university and fellowship training programs and board-certified physician and nurse specialists (Morrison, Maroney-Galin, Kralovec, & Meier, 2005).

Despite this expansion of services, the field is still evolving, and nowhere is this more evident than within geriatrics. There is a dearth of strong clinical research on which to base practice. Frequently, interventions proven effective in a younger adult population have not yet been systematically tested in the elderly. Evidence-based gerontologic palliative care is progressing and will serve as the basis for quality care of older adults and families experiencing life-threatening, chronic, and progressive illness.

Older patients often suffer from multiple coexisting chronic and life-limiting illnesses. Continued development of palliative-care knowledge and services can ease suffering and enhance the potential for personal growth as older adults approach the end of life.

Dorothy Wholihan
Deborah Witt Sherman

See also

Death Anxiety
Hospice
Pain: Acute, Chronic
Pain Assessment Instruments

Internet Resources

American Geriatrics Society
http://www.americangeriatrics.org

American Academy of Hospice and Palliative Care Medicine
http://www.aahpm.org

End of Life/Palliative Education Resource Center (EPERC)
http://www.eperc.mcw.edu

Growthhouse
http://www.growthhouse.org

Hospice and Palliative Nurses Association
http://www.hpna.org

REFERENCES

Berry, P. H., & Matzo, M. L. (2004). Death and an aging society. In M. L. Matzo & D. W. Sherman (Eds.), *Gerontologic palliative care nursing* (pp. 31–50). St. Louis, MO: Mosby Company.

Coyle, N., & Layman-Goldstein, M. (2006). Pain assessment and pharmacologic intervention. In M. L. Matzo & D.W. Sherman (Eds.), *Palliative care nursing: Quality care to the end of life* (pp. 345–406). New York: Springer Publishing.

Israel, J. L., & Morrison, S. R. (2002). Geriatric palliative care. In A.M. Berger, R. K. Portenoy, & D. E. Weissman (Eds.), *Principles and practices of palliative care and supportive oncology* (pp. 1062–1070). Philadelphia: Lippincott Williams & Wilkins.

Meier, D. E., & Monias, A. (2005). Palliative medicine and care of the elderly. In G. Hanks, N. I. Cherney, K. Calman, & D. Doyle (Eds.), *Oxford textbook of palliative medicine* (pp. 935–944). New York: Oxford University Press.

Morrison, R. S., Maroney-Galin, C., Kralovec, P. D., & Meier, D. E. (2005). The growth of palliative care programs in United States hospitals. *Journal of Palliative Medicine*, *8*, 1127–1134.

Morrison, R. S., & Meier, D. E. (2003). *Geriatric palliative care*. New York: Oxford University Press.

National Consensus Project (2004). *Clinical practice guidelines for quality palliative care*. Available at http://www.nationalconsensusproject.org

Pitorak, E. F., & Montana, B. (2004). Pain assessment and management. In M.L. Matzo & D.W. Sherman (Eds.), *Gerontologic palliative care nursing* (pp. 412–448). St. Louis, MO: Mosby Company.

SUPPORT Principal Investigators (1995). A controlled trial to improve care for seriously ill hospitalized patients. *Journal of the American Medical Association*, *274*, 1591–1598.

PARKINSONISM

Parkinsonism refers to a clinical constellation of motor signs including rigidity, bradykinesia, rest tremor, and postural instability. It may arise from a diverse array of causes (see Table P.2) but most commonly is due to idiopathic Parkinson's disease, an age-related, progressive, and incurable neurodegenerative disorder.

Parkinson's Disease Epidemiology

Population-based study estimates of prevalence of Parkinson's disease vary but, in general, the disease is rare in persons under 50 years of age, affects approximately 1% of those older than 60 years, and up to 4% of those older than 80 years (de Lau & Breteler, 2006). There is a slight male predominance (i.e., 1.2–1.7:1). Epidemiological studies have suggested rural residence, occupational exposures, and pesticide exposure as environmental risk factors for Parkinson's disease (Allam, Del Castillo, & Navajas, 2005). It is interesting that coffee consumption and cigarette smoking have repeatedly been associated with a decreased risk of Parkinson's disease.

TABLE P.2 Parkinsonism as a Feature of Other Conditions

- Parkinson's-plus disorders
  - Progressive Supranuclear Palsy
  - Corticobasal Degeneration
  - Multiple System Atrophy
- Dementing illnesses
  - Alzheimer's disease
  - Dementia with Lewy Bodies
  - Frontotemporal dementia
- Heredodegenerative diseases
  - Huntington's chorea
  - Wilson's disease
  - Spinocerebellar ataxias
  - Lubag
- Drugs
  - Neuroleptic medications (haloperidol and others)
  - Anti-emetic agents (prochlorperazine, metoclopramide)
  - Dopamine depleting agents (tetrabenzine, reserpine)
  - Valproic acid
  - Calcium channel-blocking agents
- Infections and masses
  - Post-encephalitic Parkinsonism
  - Lesions (infectious or neoplastic) of the basal ganglia or midbrain
  - HIV
  - Prion disorders (e.g. Creutzfeldt-Jacob disease) (rare)
- Toxic
  - MPTP
  - Manganese
  - Organic solvents
  - Cyanide
  - Carbon monoxide
  - Carbon Disulphide
- Other
  - Vascular Parkinsonism
  - Normal Pressure Hydrocephalus

Parkinson's Disease Pathogenesis

Parkinsonism results from loss of the effect of dopamine on the basal ganglia. In Parkinson's disease, this occurs from attrition of dopamine-producing neurons in the substantia nigra, with Lewy bodies present in many of the surviving neurons. However, neuronal damage is now understood to be more widespread than previously appreciated, resulting from an interplay of environmental and genetic causes. Accidental ingestion of a drug contaminant 1-methyl-4-phenyl-1,2,3,6-tetrahydro- pyridine (MPTP) by several individuals in the 1980s demonstrated that Parkinsonism can arise from chemical exposure, and compounds including rotenone and paraquat led to Parkinsonism in animals. However, genetic predisposition likely defines susceptibility to toxins. Mutations in α-synuclein, parkin, UCH-L1, PINK1, DJ-1, and LRRK2 have now been identified in familial Parkinson's disease, and parkin, PINK1, and LRRK2 mutations may lead to sporadic disease. The precise roles of these genes are unclear, but multiple lines of evidence point to impairment in cellular processing of damaged proteins and altered energy metabolism from deficient mitochondrial activity (Beal, 2005).

Clinical Manifestations

Resting tremor, muscle rigidity, bradykinesia (i.e., delayed or slowed execution of movement), and decline in postural reflexes are the cardinal features of Parkinsonism. Bradykinesia manifests itself as hypophonia, hypomimia (or "masked facies"), difficulty with fine coordination, micrographia, and slowed gait. Some patients experience freezing, which is a sudden block of motor function. Swallowing is affected in many, and dysphagia places the patient at risk of aspiration. Muscular rigidity is described as "lead pipe" in quality (independent of velocity of movement on passive motion), often with "cogwheeling," a superimposed tremor leading to a ratchet-like movement. Patients may experience rigidity as stiffness and pain, and it is sometimes confused with musculoskeletal syndromes such as "rotator-cuff tear." Impaired postural reflexes lead to falls, a significant source of morbidity and mortality, and may result from a tendency to propel forward (i.e., propulsion) or backward (i.e., retropulsion), from festination (i.e., progressively faster and smaller steps), and freezing.

Symptoms in idiopathic Parkinson's disease are usually asymmetric. Resting tremor is a common initial symptom but is absent in approximately 30% of cases. In addition to features described previously, dystonia is more common in younger Parkinson's disease patients, resulting in a diagnostic challenge. Nonmotor symptoms are common in Parkinson's disease. Dementia and depression develop in 30% to 45% and 40% to 50% of individuals, respectively (Aarsland et al., 2001; Marder, Tang, Cote, Stern, & Mayeux, 1995). Hallucinations or paranoid ideation may be seen later in the disease, often induced by medications. Autonomic dysfunction, including orthostatic hypotension, excessive sweating, urinary frequency and incontinence, sexual dysfunction, and constipation, may occur. Disturbances of sleep are common and include REM-behavior disorders, sleep apnea, restless legs syndrome, and excessive daytime drowsiness.

Diagnosis

Parkinsonism is diagnosed purely on clinical grounds: a detailed history and physical examination aids in formulating the most likely cause. The differential diagnosis includes idiopathic Parkinson's disease, Parkinson's-Plus syndromes, dementia with Lewy bodies as well as a diverse array of disorders that include Parkinsonian features (see Table P.2). Parkinson's disease commonly affects the arms more than the legs: The finding of predominantly lower-body Parkinsonism therefore warrants brain imaging to rule out normal pressure hydrocephalus or vascular Parkinsonism. Slow eye movements and "square wave jerks" with early impairment of postural reflexes or freezing are suggestive of progressive supranuclear palsy. Apraxia, the so-called alien limb syndrome, and dystonia may suggest corticobasal degeneration. Prominent autonomic dysfunction raises the possibility of Multiple System Atrophy.

Positron emission tomography (PET) scans measuring brain flurodopa (FDOPA) or fluro-deoxyglucose (FDG) uptake have been extensively used in research to examine Parkinsonism. In some atypical cases, they can be helpful to support diagnosis but are expensive and usually not clinically necessary. The role of genetic testing has yet to be well defined, and there are no current guidelines on genetic testing. Parkin and PINK1 testing is commercially available, although other genes are tested at various academic centers. Gene testing is not routinely advised, but if patients request testing, it is strongly recommended that this be carried out through a specialized center with professional genetic counseling.

Pharmacotherapy

There are many drugs for symptomatic treatment of Parkinson's disease, and published treatment recommendations aid in formulating an appropriate treatment strategy (Miyasaki, Martin, Suchowersky, Weiner, & Lang, 2002; Pahwa et al., 2006). Unfortunately, other forms of Parkinsonism usually respond little if at all to these interventions (see Table P.2). Levodopa remains the cornerstone of therapy and significantly improves the reduced life expectancy associated in the past with Parkinson's disease. In general, levodopa is preferred over other drugs in the elderly due to its tolerability; however, when making a treatment choice, it is important to consider a patient's "functional" rather than chronological age.

Unfortunately, after months to years, most patients develop motor complications of levodopa therapy. These include "wearing off"—that is, a shorter duration of drug effect leading to reemergence of symptoms at progressively smaller intervals. Such individuals often experience fluctuations between the "on" and "off" state, necessitating frequent levodopa dosing to remain in the "on" state with symptom control. Dyskinesias, another form of motor complications, are involuntary and sometimes disabling choreiform movements, most commonly seen as levodopa effect peaks, although sometimes seen at onset or as wearing off occurs. Dopamine agonists have more short-term side effects than levodopa, particularly in the elderly, but in studies are associated with less development of motor complications. Other medications such as amantadine and anticholinergic agents are often of limited value in the geriatric population due to cognitive side effects.

Attention to nonmotor symptoms can significantly enhance a patient's quality of life (Chaudhuri, Healy, & Schapira, 2006). Although not well studied, many patients benefit from antidepressant treatment. Symptoms of dementia may show a modest response to acetylcholinesterase inhibitors, and rivastigmine has recently been approved for treatment of Parkinson's disease dementia. Hallucinations and illusions commonly respond to low doses of quetiapine. Typical neuroleptic agents such as haloperidol should be avoided because these worsen Parkinson's disease symptoms. Orthostasis may require increased hydration, increased salt in the diet, or medications such as fludrocortisone or midodrine. Urinary symptoms often respond to anticholinergic agents, and constipation should be aggressively treated with dietary changes and medications if needed. Treatment for sexual dysfunction in Parkinson's disease has been poorly studied, but some men benefit from phosphodiesterase inhibitors.

Nonpharmacologic Treatment

Despite a paucity of clinical trials of nonpharmacologic interventions for Parkinsonism, it is imperative that these be considered in an optimal therapeutic regimen. Physical and occupational therapy, and speech therapy including the Lee Silverman Voice Treatment, are crucial for many individuals with symptoms that do not respond well to medications. Alternative therapies, such as tai chi, yoga, and acupuncture, can be helpful to improve function and sense of well-being.

Surgical treatment for Parkinson's disease has been increasingly utilized in the last few years. Most commonly, this involves insertion of electrodes for continuous high frequency deep brain stimulation (DBS). This approach is valuable in advanced Parkinson's disease when medications cannot adequately control motor symptoms, but older patients need to be very carefully screened prior to considering such an intervention. Although complications are rare, the risks of surgery make this an intervention reserved for a minority of carefully selected patients, and it is not used in other forms of Parkinsonism. Stem-cell transplant and gene-therapy techniques are now being explored as future potential treatments.

Psychosocial Implications

Parkinsonism has profound ramifications for patients, families, and caregivers. It affects ability to work and may lead to early retirement and changes in social roles (Groves & Forrest, 2005). A multidisciplinary team approach can help a patient and their families and caregivers achieve the highest possible quality of life. This often means involving a neurologist closely collaborating with a primary care provider along with skilled nurses, social workers, specialists in rehabilitation medicine, and professionals able to perform counseling and psychiatric evaluation. Individual counseling forms a large part of our clinic visits, and support groups can be a highly effective forum for exchange of information, whereas home-care services are invaluable in managing more advanced patients. Appropriate institutional care may be considered when the patient's needs are no longer safely met at home. Given the physical, psychological, and social complexities of Parkinsonian syndromes, management for an individual with Parkinsonism is optimized by developing a flexible, creative, and integrated approach to lifestyle, with patients, families, and health care professionals operating as a team.

H. Christian Schumacher
Claire Henchcliffe

See also

Cognitive Changes in Aging
Depression in Dementia
Falls Prevention
Gait Disturbances

Internet Resources

American Parkinson Disease Association, Inc.
http://www.aParkinson'sdiseaseaparkinson.com

National Parkinson Foundation, Inc.
http://www.parkinson.org

Parkinson's Disease Foundation
http://www.parkinsonsfoundation.org

REFERENCES

Aarsland, D., Andersen, K., Larsen, J. P., Lolk, A., Nielsen, H., & Kragh–Sørensen, P. (2001). Risk of dementia in Parkinson's disease: A community-based, prospective study. *Neurology*, *56*(6), 730–736.

Allam, M. F., Del Castillo, A. S., & Navajas, R. F. (2005). Parkinson's disease risk factors: Genetic, environmental, or both? *Neurological Research*, *27*(2), 206–208.

Beal, M. F. (2005). Mitochondria take center stage in aging and neurodegeneration. *Annals of Neurology*, *58*(4), 495–505.

Chaudhuri, K. R., Healy, D. G., & Schapira, A. H. (2006). Non-motor symptoms of Parkinson's disease: Diagnosis and management. *Lancet Neurology*, *5*(3), 235–245.

de Lau, L. M., & Breteler, M. M. (2006). Epidemiology of Parkinson's disease. *Lancet Neurology*, *5*(6), 525–535.

Groves, M. S., & Forrest, D. V. (2005). Parkinson's disease as a model for psychosocial issues in chronic neurodegenerative disease. *Advances in Neurology*, *96*, 65–83.

Marder, K., Tang, M. X., Cote, L., Stern, Y., & Mayeux, R. (1995). The frequency and associated risk factors for dementia in patients with Parkinson's disease. *Archives of Neurology*, *52*(7), 695–701.

Miyasaki, J. M., Martin, W., Suchowersky, O., Weiner, W. J., & Lang, A. E. (2002). Practice parameter: Initiation of treatment for Parkinson's disease: An evidence-based review. Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology*, *58*(1), 11–17.

Pahwa, R., Factor, S. A., Lyons, K. E., Ondo, W. G., Gronseth, G., Bronte-Stewart, H., et al. (2006). Practice Parameter: Treatment of Parkinson's disease with motor fluctuations and dyskinesia (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology*, *66*(7), 983–995.

PATIENT–PROVIDER RELATIONSHIPS

A strong patient–provider relationship is based on open and clear communication between the patient and provider. Historically, a provider-centered model was primarily used; providers were much more likely than today to make unilateral decisions. This former model of patient–provider relationships has been criticized as overly paternalistic and has been increasingly replaced by a more collaborative model, in which patients are partners with their providers in a discussion that, ideally, combines evidence-based decision making with a more nuanced understanding of the patient's values and goals.

This ideal model of patient–provider communication is referred to as *shared decision making* or *participatory decision making* (Epstein, Alper, & Quill, 2004; Frosch & Kaplan, 1999). The U.S. Preventive Service Task Force defines shared decision making as the process through which the patient (1) understands the risks associated with the disease or condition; (2) understands the treatment options, including risks, benefits, alternatives, and uncertainties; (3) considers the potential risks and benefits associated with treatment in the context of his or her own personal values; and (4) has engaged in decision making at a personally desired and comfortable level (Sheridan, Harris, & Woolf, 2004). Thus, although the provider is no longer the sole source of health care information—increasingly the case in this era of unprecedented access to multiple streams of health information, as well as misinformation—the provider's role in presenting objective advice and education necessary for making a truly informed decision remains critical.

Shared decision making has concrete benefits beyond increasing the patient's autonomy. It also improves the exchange of information between patient and provider, increases the provider's consideration of all treatment options (not merely those most familiar to the provider), reduces the potential for conflict in the patient–provider relationship, and—importantly—has the potential to enhance adherence to treatment by patients who are active partners in their treatment decisions and plans rather than passive recipients (Epstein et al., 2004; Frosch & Kaplan 1999).

Shared Decision Making in the Elderly

The patient–provider relationship has special relevance in the health care of the elderly, for several reasons. First, older people frequently face multiple health challenges, leading to increases in health care encounters and decisions. Second, the process of aging potentially involves functional impairment and cognitive decline that can complicate communication between the patient and provider. Third, health care decisions involving older patients often involve the perspective and input of third parties such as friends and family. Finally, health care problems generally increase in complexity and severity with age, requiring explicit discussion of end-of-life issues.

Numerous studies suggest that interest in active participation in the decision making process is associated with younger age and higher education (Frosch & Kaplan, 1999). However, sociodemographic factors likely explain only part of the variability. Other factors should be considered in understanding reasons for some patients' limited interest in shared decision making. For instance, cohort effects of higher levels of deference to authority figures may explain part of the lower interest level in participatory decision making among the elderly. Other factors may be age-related, such as severity or complexity of illness and current quality of life. Although older patients appear to differ in the degree of interest in shared decision making, almost all continue to value open discussion of treatment options and personal values (Frosch & Kaplan, 1999). Moreover, despite the varying level of patient interest in actively participating in decision making, it is incumbent on providers to consider patients' individual values and preferences in the context of treatment goals—information ideally obtained through the process of shared decision making.

Cognition and Shared Decision Making

Increased age is a risk factor for cognitive impairment, which in turn may affect the abilities necessary for adequate decision-making capacity. On the other hand, mild cognitive deficits do not always imply impaired decision-making capacity. Thus, many patients who have cognitive deficits are able to participate at some level in the shared decision-making process. Increasingly, it is recognized that decisional capacity can be optimized or enhanced through techniques as simple as repetition and checking for understanding. With more complex decisions, special care should be taken to explain concepts carefully, assess for understanding, and involve support systems such as family or caregivers. Even when a patient lacks the capacity to participate in some decisions, he or she may continue to possess capacity to participate in decisions dealing with less complex issues and to express basic values and preferences (Ganzini, Volicer, Nelson, Fox, & Derse, 2005).

The Role of Third Parties

Although the Western model of patient care emphasizes autonomous decision making by the individual, patient care rarely occurs in a vacuum of a single individual acting independently. Older patients often rely on family members, friends, or caregivers for support in medical decision making. As persons presumably familiar with an individual's interests and values, third parties often serve as sources of information that can complement information from the patient. The dilemma for the provider is in balancing the strengths supplied by the additional perspectives of those involved in a patient's social system against the potential for conflict with multiple parties whose interests and values may differ from the patient and the provider. An empirical literature is emerging, for example, that raises questions about the extent to which surrogate decision makers' choices accurately reflect the wishes or preferences of the patient (Shalowitz, Garrett-Mayer, & Wendler, 2006). Back and Arnold have outlined a stepwise method for conflict negotiation, stressing the importance of a nonjudgmental attitude that seeks a better understanding of the third party's unique perspective. They also emphasize the need for the provider to be nondefensive—able to step back from the disagreement and reconsider the conflict objectively (Back & Arnold, 2005). In extreme cases such as emergent end-of-life care or cognitive impairment, in which the direct input of the patient may be unavailable, providers should help families reflect on the values and preferences of the patient. The provider can then discuss the family's values in the context of the patient's personal values and assist in reaching a consensus on goals. The final decisions should be the result of collaboration, not the victory of one party's viewpoint over that of others.

End-of-Life Decision Making

The majority of aging patients will be confronted at some point by important end-of-life decisions. However, although terminal illnesses bring these decisions into stark relief, the issues raised—such as defining desired treatment outcomes and developing advance care plans—are certainly not unique to the terminally ill.

In developmental terminology, the key task of the last stage of life is to integrate one's life viewpoint and experience with the realization of one's personal mortality. This developmental process is facilitated by patient–provider communication that is open to discussion of mortality and end-of-life issues, preferences, and goals. However, patients and families, often unable to accept the terminal nature of an illness, may postpone discussion of patients' preferences regarding end-of-life care until the final stages of a disease. Patients may conceal their distress and concerns, patients and families may remain optimistic despite medical futility, and there may be cultural prohibitions against open discussions of end-of-life issues (Larson & Tobin, 2000). A frank discussion with the provider, beginning at the time of initial terminal diagnosis, is necessary, however, so that patients and families can adequately prepare for these difficult matters. The provider has a duty to take an active role in leading these discussions, discussions that, above all, require a patient-centered shared decision-making model.

Barriers to implementation of this model of end-of-life decision making include time constraints, leading to discussion mainly of immediate clinical concerns with limited attention devoted to discussion of patient preferences, family members' concerns, and other aspects of end-of-life care. Moreover, it is often difficult to identify the locus of responsibility for conducting end-of-life discussions because multiple disciplines, specialties, and sites are commonly involved in the care of the terminally ill (Larson & Tobin, 2000). Ideally, a multidisciplinary approach should be taken to end-of-life issues, integrating not only medical but also cultural, familial, social, psychological, and spiritual perspectives.

Conclusion

The tasks of a successful patient–provider relationship may be conceptualized as outlined by Epstein and colleagues (2004). First, clinicians should strive to develop a partnership with the patient and family members that allows for open discussion of the patient's values and treatment goals. Second, providers have a duty to ensure that the patient understands the information necessary for an informed decision. Finally, the responsibility for making a treatment decision is not solely the patient's; the provider shares the responsibility of giving evidence-based recommendations on how best to meet the patient's goals. In the end, there are no "right" or "wrong" choices in the successful patient–provider relationship but rather stages of mutual understanding (Epstein et al., 2004).

Daniel S. Kim
Laura B. Dunn

See also

Advance Directives
Autonomy
Communication Issues for Practitioners
Competency and Capacity
Consumer-Directed Care

Internet Resources

Society for Medical Decision Making
http://www.smdm.org/

Ottawa Health Research Institute: Patient Decision Aids
http://www.ohri.ca/DecisionAid/

Foundation for Informed Medical Decision Making
www.fimdm.org

REFERENCES

Back, A. L., & Arnold, R. M. (2005). Dealing with conflict in caring for the seriously ill: "It was just out of the question." *Journal of the American Medical Association*, *293*(11), 1374–1381.

Epstein, R. M., Alper, B. S., & Quill, T. E. (2004). Communicating evidence for participatory decision making. *Journal of the American Medical Association*, *291*(19), 2359–2366.

Frosch, D. L., & Kaplan, R. M. (1999). Shared decision making in clinical medicine: Past research and future directions. *American Journal of Preventive Medicine*, *17*(4), 85–94.

Ganzini, L., Volicer, L., Nelson, W. A., Fox, E., & Derse, A. R. (2005). Ten myths about decision-making capacity. *Journal of the American Medical Directors Association*, *6* (3 Suppl), S100–S104.

Larson, D. G., & Tobin, D. R. (2000). End-of-life conversations: Evolving practice and theory. *Journal of the American Medical Association*, *284*(12), 1573–1578.

Shalowitz, D. I., Garrett-Mayer, E., & Wendler, D. (2006). The accuracy of surrogate decision makers: A systematic review. *Archives of Internal Medicine*, *166*(5), 493–497.

Sheridan, S. L., Harris, R. P., & Woolf, S. H. (2004). Shared decision making about screening and chemoprevention: A suggested approach from the U.S. Preventive Services Task Force. *American Journal of Preventive Medicine*, *26*(1), 56–66.

PENSIONS AND FINANCING RETIREMENT

Almost all of us hope to retire from full-time work years before we die. But this is impossible unless there is a stream of money to pay for needs during the retirement years. Traditionally, the stream of retirement benefits was in the form of a pension provided by a government entity or private employer. Now, retirement benefits depend much more on savings that individuals accumulate during their working lives.

Most Americans are neither saving enough for retirement nor investing saved funds the right way. To live the good life in retirement, the prescription is simple. First, starting at age 25 or earlier, employee and employer should put at least 15% of an employee's gross income *every year* into a retirement fund. Second, that money should be invested in a *diversified* portfolio of stocks and bonds. Major mutual fund organizations now offer low-cost professionally managed "target retirement date" funds that try to capture the risk-return tradeoffs appropriate for investing retirement savings. Third, upon retirement, no more than 5% of the current market-value balance of retirement savings should be withdrawn in any year.

Some Demographic Trends

People are living longer and retiring earlier—a bad combination for those concerned about retirement financing. Most Americans now retire by the age of 65 and live into their 80s. Although recently there is some slight upward drift in retirement age (since the age for full federal Social Security benefits was increased to 67), almost a third of adult life must be financed by retirement savings.

In the United States and other mature industrialized countries, there will be a significant increase in those older than 65 years of age relative to the size of the working populations because of long-term declines in birth rates. This implies that unfunded government pension funds will be under enormous pressure in the next 30 years to either raise taxes on those working to pay current retirement expenses or to "change the rules" (e.g., increase full-benefits retirement age) to manage these pension costs. Some countries (and some local governments in the United States) may have to default on part of the promised payments. So it is more important than ever to finance retirement from multiple sources.

Sources of Funds for Financing Retirement

There are five basic sources of funds for financing retirement and at various points in the last 2,000 years, each has been important: governments, family, social institutions, private employers, and personal savings. It is unlikely that society will return to the 19th-century era of farming communities in which family and social institutions (mostly churches) were the providers of retirement needs of the widows or the few nonworking old men still alive; hence, the need for other possible sources.

Pension funds are collections of promises to pay workers upon retirement a more or less fixed annuity for the rest of their lives (and generally some additional payments to the widows of the worker). Government pension plans and private pension plans have different legal structures and different funding arrangements.

Federal government pensions are almost always unfunded and rely on the current taxing and money printing power of the government to make current payments on the promised pensions. That is true in the United States for the Social Security system. A collapse or default of federal government seems unlikely, yet the truth is that of more than 500 countries in the world in the last 1,000 years, fewer than 10 have lasted more than 200 years without defaulting on promised payments or ceasing to exist. Even the United States defaulted on a variety of payments in its early history.

Assuming the United States continues to exist, s*ocial security annuity payments* and other federal government pension plans are virtually certain to be paid at close to the currently promised levels for at least the next 50 years. These payments constitute the core source of funding for any retirement funding plan. For the median household with pre-retirement income of $50,000, Social Security will provide payments of something under $30,000—50% to 60% of pre-retirement income. Payments are not proportional to income; therefore, a household with income of $100,000 would receive Social Security payments somewhat below $40,000.

State and local pension plans, usually generous arrangements to attract firefighters, police, teachers, and managers who might be paid more in the private sector, are in jeopardy. States do not have unlimited taxing powers and cannot print money. Most states make payments into pension accounts that are separate trusts, but these payments, and the often unprofessional way the trust portfolios are managed, are generally not sufficient to fully fund the annuity obligations of current and future retirees. Therefore, states and local governments have resorted to a "pay as you go" system to fund part of the current and future obligation payments. Some local governments have already reached a stage in which pension and health payments and debt-obligation payments have become a significant proportion of taxes collected. In a serious recession, some of these local governments (and perhaps even a few states) would be forced into technical bankruptcy—at which point pension payments could be reduced.

Private pension plans are a development of the 20th century (actually starting in the United States around 1875). The intent was to mirror government plans to attract workers who would stay with the company for many years and then retire before they became too old. Traditional private pensions (now usually called defined-benefit plans) were set up to pay an annuity to retired workers based on the number of years of employment and an end-of-employment weighted salary level. Only about half of those employed in the private sector in the United States have pensions provided by their employer. In 2006, Congress passed legislation that will tighten the funding and government insurance regulations for defined-benefit plans. That legislation will probably speed up the exit of private firms from traditional defined-benefit pension plans (Joint Committee on Taxation, 2006).

Under traditional pension plans, firms bear almost all the risk of fluctuations in the prices of stocks and bonds that make up the pension portfolio. Under the *defined contribution*– type plans that more and more firms are now offering in place of traditional pension plans, the market fluctuation risks are borne by the worker. This means there is no underfunding possible. The firm (and usually the employee) makes defined contributions (i.e., a fraction of current salary) to the pension account and the employee decides within the plan limits how to invest it. The plan benefits can be paid out in a variety of ways during retirement. One way is to use some of the money to buy an annuity. That is, by using the financial markets, an individual can replicate all or part of the pension the employee might have been paid under a traditional (correctly funded) defined-benefits plan.

In the 21st century, the primary source of retirement funding will be *personal savings,* with many people spending a third of their adult lives in retirement. Retirement income starts with Social Security as an annuity base. Private-firm-defined contribution type plans generally offer 5% to 10% contribution with the employee adding 3% to 5%. Assume these contributions total 12% of base salary. In a really good market environment, such as existed from 1960 to 2000, this might be enough retirement saving if funded over a 40-year period. But most professionals expect the markets to be more normal during the next 30 years with total returns lower than the past 30 years. Therefore, it is prudent to consider saving part of after-tax income as another part of retirement funding. The amount depends very much on the desired lifestyle and current needs; 5% may be too little, 15% is probably more than enough.

Managing Retirement Funds

Managing a retirement portfolio is a job for financial professionals; most individuals are simply not qualified. Instead, it is an individual's job is to make a couple of key selections that do not have to be changed very often and to audit the money-management professionals. That audit should see that funds are at least tracking the total return of an appropriate market index over a 3- to 5-year period (as opposed to quarter-to-quarter performance). The audit should also make sure all the costs are reasonable. Some mutual funds and others will provide total management for under 0.60% of the value of the funds managed; any arrangement that costs more than a yearly fee of 1.5% of the funds being managed should be closely scrutinized.

There is nothing more important than having a *diversified portfolio*, which means owning a mixture of bonds and stocks—including domestic stocks and international stocks, large-firm stocks, and some stocks from firms not so large. It is unwise to (1) invest more than 5% of any retirement portfolio in the stock of the employer; (2) invest any funds in CDs or money market funds unless retirement is just a few years away; and (3) invest in high-risk exotics (e.g., hedge funds, option funds, currencies, commodity funds). Professionals can provide advice on how much to put in stocks versus bonds. Major mutual fund organizations now offer target-date-retirement–type portfolios. For example, an individual who expects to retire in 2030 may have a mixture of 70% stocks 30% bonds for the first 5 years, then switch to 65% stocks–35% bonds the next 5 years. The mix can be changed every few years until it is 30% stocks–70% bonds just prior to retirement. Similar plans are available for managing the funds following retirement.

To encourage personal saving for retirement, the federal government has created a variety of *incentive programs* that offer tax breaks to the participants. Some of these programs (i.e., various categories of Keogh plans for small firms or individual business owners; various kinds of Individual Retirement Account programs for employees of firms that do not offer retirement savings programs) are designed to benefit those who do not have government or firm retirement savings programs and permit pretax deductions from wages for funding the program. Other types of IRAs are available to many wage earners who want to make after-tax contributions to help fund their retirement. Congress frequently changes the incentives on these plans and offers new plans to encourage saving for retirement. However, even if there were no incentive plans offered, it is important to add some additional personal saving to the sources of future retirement funding.

As part of any oversight, individuals also need to learn some of the *language of finance*. Professionals use concepts like current yield, yield to call, total return on the portfolio, volatility, the beta and alpha of the portfolio, and hedge risk management. Using the Web sources cited herein, individuals can, in less than 50 hours, learn some of these basics. This knowledge will provide insights into how professionals try to think about risks and returns in the financial markets as they manage money.

Financing retirement needs is an important part of family budgeting. It is not something that can be put off until a few years before retirement. In the 21st century, financing retirement is not a task that can be left to others—be it the federal government or employer—to do. Just as people pay their utility bills every month, so too they must pay their retirement account bill every month of their working life in order to have a good retirement.

MICHAEL KEENAN

See also
Retirement

Internet Resources

AARP
www.aarp.org

Fidelity Mutual Funds
www.fidelity.com

Forbes
www.forbes.com

London School of Economics UBS Pensions Research Program
http://www.lse.ac.uk/ubs

Money Magazine
www.money.cnn.com

The 2006 Pension Protection Act
http://www.house.gov/jct/x-38-06.pdf

University of Pennsylvania Pension Research Council
http://www.pensionresearchcouncil.org/

Vanguard Mutual Funds
http://www.vanguard.com

Wikipedia
http://www.wikipedia.org

The following are two entries are widely used textbooks that offer sections on security analysis and portfolio management:

Damodaran, A. (2002) *Investment valuation.* Hoboken, NJ: John Wiley Publishing.

Reilly, F. K., & Brown, K. C. (2002). *Investment analysis and portfolio Management.* Belmont, CA: Southwestern College Publishing.

REFERENCES

Joint Committee on Taxation. (2006). Technical explanation of H.R. 4., the "Pension Protection Act of 2006," as passed by the House on JULY 28, 2006, and as considered by the Senate on ON AUGUST 3, 2006. Available at: http://www.house.gov/jct/x-38-06.pdf.

PERCUTANEOUS ENDOSCOPIC GASTROSTOMY (PEG) TUBE FEEDING

See
Feeding: Non-Oral

PERIPHERAL ARTERIAL DISEASE

Prevalence and Risk

Atherosclerosis is the most frequent cause of chronic peripheral arterial occlusive disease (PAD), the prevalence of which increases significantly with age (Weitz et al., 1996). It is a disease process that involves both large and small arteries. By definition, PAD includes the carotid, renal, and gastric arteries. This discussion focuses on disease of the lower extremities.

Approximately 15% of people older than age 50 have lower-extremity PAD, as diagnosed by noninvasive techniques (Weitz et al., 1996). Recently, the National Health and Nutrition Examination Study (NHANES) analyzed data from its 1999–2000 study and found that 4.3% of noninstitutionalized people older than 40 had PAD, which represents approximately 5 million individuals (Selvin & Erlinger, 2004). Among those older than 70, the incidence was 14.5%. Because this study did not survey nursing-home residents, it may have underestimated the prevalence, especially among the elderly. The Honolulu Heart Program, which followed a cohort of elderly Japanese men to age 93, found that the incidence of PAD (defined by an ankle-brachial index [ABI] of less than 0.9) increased from 8% in those 71 to 74 years to 27.4% in those 85 to 93 years (Curb et al., 1996).

The risk factors for PAD are the same as those for atherosclerotic disease: cigarette smoking, diabetes mellitus, hypertension, hyperlipidemia, polycythemia, hyperhomocysteinemia, age, family history of vascular disease, and, in women, early history of hysterectomy or oophorectomy (Hirsch et al., 2006). The NHANES also found significant associations between black ethnicity, decreased renal function (Selvin & Erlinger, 2004), and inflammatory markers such as CRP, fibrinogen, and leukocytosis (Wildman, Munter, Chen, Sutton-Tyrell, & Jiang, 2005). Increasing age is a crucial determinant of vascular disease, with more than half of all events occurring in the minority (6%) of the population 75 years or older (Rothwell et al., 2005). The implications of these findings are obvious, especially because many of the events leave long-term, often devastating, disability.

History and Clinical Manifestations

Symptoms of lower-extremity arterial insufficiency are local manifestations of a generalized disease process. Intermittent claudication, one of the most characteristic symptoms of PAD, is usually described by patients as exercise-induced pain in the lower extremity (i.e., calf, thigh, or buttock) or as profound fatigue that is quickly relieved by rest. Symptoms appear distal to the site of occlusive lesions. Often, symptoms of claudication can be confused with those of spinal stenosis. Classically, the pain of spinal stenosis is relieved with bending forward, not by rest alone. Ischemic rest pain develops when the blood supply is severely compromised and is inadequate even at rest. Patients may describe burning or pain that is exacerbated by elevation of lower extremities and relieved by slow walking or by keeping the foot in a dependent position. The differential diagnosis of PAD also includes peripheral neuropathy; spinal nerve-root compression; venous claudication; chronic compartment syndrome; and inflammatory arthritis of the knees, feet, hip, and back. Determining the actual cause of lower-extremity pain can be difficult, but the ACC/AHA Guidelines for the diagnosis of PAD outline specific maneuvers and characteristics of each (Hirsch et al., 2006).

Physical examination of the lower extremities should include careful inspection of both legs, checking for discoloration, shiny appearance, alopecia, nail or skin atrophy, dependent rubor, and ulceration. The clinician should palpate the femoral, posterior tibial, and dorsalis pedis arteries and auscultate the femoral arteries for bruits. The dorsalis pedis pulse is absent in 5% to 8% of normal subjects, but the posterior tibialis pulse should be present (both are absent in only 0.5% of patients). As disease advances, mottling in a "fishnet pattern" can occur. The feet become cold and ulcers heal poorly. The classic "5 P's" can be kept in mind when critical limb ischemia occurs: pain, pallor, pulselessness, paraesthesia, and paralysis. Gangrene occurs when arterial flow is inadequate to maintain viability of the tissues.

Screening for Peripheral Arterial Disease

Currently, the U.S. Preventive Services Task Force (USPSTF) and the American Academy of Family Physicians do not recommend screening with ABI for asymptomatic adults. However, The American Diabetes Association recommends yearly screening (i.e., history and palpation of peripheral pulses) for persons with diabetes. A few organizations, including the American Heart Association and the Association for the Society of Interventional Radiology, support the use of ABI in the evaluation of suspected PAD (USPST and Web references).

Diagnostic Testing

An absence or decrease in the force of the pedal pulses is an indication for obtaining an ABI, a simple method of identifying the degree of vascular insufficiency. Normally, distal blood pressures are higher than brachial blood pressures. Acceptable ABIs are 1.0 or greater. In diabetic patients and those with end-stage renal disease, the ABI can be falsely elevated because of tibial artery calcification. Ischemic wounds and ankle surgery may interfere with pressure measurements.

Another useful test in assessing PAD is sequential limb pressures, which are obtained by placing cuffs at different levels on the lower extremities. A 20 to 30mm Hg discrepancy between extremities is indicative of occlusion proximal to the cuff in the extremity with decreased pressure. A decrease in pressure of more than 30mm Hg in two consecutive levels in the same extremity suggests a disease process at the level proximal to the cuff (Jaff & Dorros, 1998).

Pulse-volume recordings are another qualitative test to identify occlusive lesions. These are plethysmographic tracings that demonstrate changes in blood flow through a lower extremity. Attenuation of the waveform (which is normally a rapid systemic upstroke) is indicative of PAD. This test may not be accurate in distal segments or in patients with low cardiac output. Other tests include toe systolic pressure measurements, duplex ultasonography, and transcutaneous oxymetry.

Patients referred to vascular laboratories for "noninvasive studies" will have ABI, segmental pressures, and pulse-volume recordings. Other studies must be specified by name. Treadmill exercise testing with or without ABIs is also a helpful tool to differentiate claudication from pseudoclaudication (i.e., spinal stenosis) and to follow progression of symptoms.

Angiography is an invasive method that outlines the vessel diameter and thus identifies the level and anatomy of the occlusion. Angiography is necessary if the clinician is contemplating surgery or interventional radiographic procedures. Risks of the procedure include allergic reaction to the contrast material, renal failure (especially in the setting of diabetes), and damage to the arteries or limb.

CT and MR angiography, noninvasive techniques, can assist in the diagnosis of advanced disease, especially when surgery or intervention is being contemplated. MRA has not yet replaced angiography as the "gold standard" (Sommerville, Jenkins, Walker, & Olivotto,, 2005) because the definition of small vessels is still suboptimal and overestimation of the degree of stenosis is common. It can help select patients for surgical revascularization, especially when used in combination with ultrasound. CT angiography exposes the patient to a significant contrast load and radiation, specifically considering that many will have renal disease and diabetes. If intervention is expected, conventional arteriography should be undertaken concomitantly.

Treatment

Exercise remains the most important conservative therapy for intermittent claudication, together with smoking cessation. Aggressive treatment of all cardiovascular risk is indicated, including blood pressure control, management of diabetes, and strict lipid lowering with the use of a statin. The use of ACE inhibitors should be considered for overall cardiovascular risk, especially in patients with diabetes (Hirsch et al., 2006). Aspirin or other platelet inhibitors are also recommended. Clopidogrel bisulfate (Plavix) is an *inhibitor* of ADP-induced *platelet* aggregation that has replaced ticlodipine (Ticlid) as an effective treatment of PAD. They have similar mechanisms of action, but clopidogrel has fewer hematologic adverse effects. Cilostazol (Pletal), a phosphodiesterase inhibitor that inhibits platelet aggregation and acts as a vasodilator, can increase walking distance, improve subjective quality of life, and improve ABIs (Dawson, Cutler, Meissner, & Strandness, 1998). Cilostazol is contraindicated in patients with congestive heart failure due to risk of cardiac arrhythmia and hypotension. Pentoxifylline (Trental) reduces blood viscosity and improves red-cell deformability. It is approved for the treatment of intermittent claudication, but overall efficacy is questionable. The most recent AHA/ACC guidelines suggest consideration of pentoxifylline as a second-line therapy to cilostazol for intermittent claudication because its clinical effectiveness is not well established.

Invasive modalities include percutaneous transluminal angioplasty, placement of intraluminal stents, bypass surgery, and amputation. These remain the major options for patients whose pain does not respond to lifestyle modifications and drug therapy and for those with limb-threatening ischemia.

Angioplasty has a good long-term patency rate in the common iliac artery and is further improved by the use of vascular stents—86% patency at 1 year and 74% at 4 years (Hirsch et al., 2006). Patency rates are poorer in the superficial femoral artery, particularly with longer lesions—femoropopliteal patency reaching only 62% at 1 year. In most reported series, the use of intravascular stents below the inguinal ligament has not added significantly to long-term patency. Current research is focusing on methods to prevent restenosis, including evaluation of the long-term effectiveness of coated stents, atherectomy, thermal devices, and cutting balloons.

Lower-extremity bypass surgery is most useful when the limb is threatened by ischemia; success rates approach 85% to 90% (Hirsch et al., 2006). Rarely is surgery used for claudication alone. The type of graft, either autogenous vein or synthetic graft, depends on how far distally the graft must bypass. The success and complication rates of bypass surgery appear to be better than those of amputation, and surgeons should attempt to salvage limbs in all but the most debilitated, nonambulatory patients (Weitz et al., 1996).

In the future, therapeutic angiogenesis using growth factors may become the treatment of choice for patients with PAD. Among the many growth factors currently under study, vascular endothelial growth factor and fibroblast growth factors show the most promise. Maximum benefit may occur through the administration of combinations of growth factors or the genes encoding them. At present, the clinical efficacy of angiogenic growth factor for critical limb ischemia is not well established, but ongoing clinical trials are forthcoming.

Clinical Implications

Arteriosclerosis of limb arteries is associated with coronary and cerebral atherosclerosis. Diagnosis of PAD should help identify patients who are at increased risk of cardiovascular events such as stroke and myocardial infarction. Most patients with peripheral arterial disease will die of acute cardiac events or stroke. Atherosclerotic disease of the lower extremities causes pain and can lead to limb loss; thus, early identification cannot only decrease mortality associated with other diseases but improve quality of life as well.

Erica C. Jones

See also
Cardiovascular System Overview

Internet Resource
American College of Cardiology
http://www.acc.org/clinical/guidelines/pad/summary.pdf

American Heart Association
http://americanheart.org/Scientific/statements/1996/1201.html

American College of Surgeons
http://facs.org/index.htlm

eMedicine
http://www.emedicine.com

Society of Interventional Radiology
http://www.sirweb.org/

U.S. Preventive Services Taskforce
http://www.ahrq.gov/clinic/uspstf05/pad/padrs.htm

REFERENCES

Curb, J. D., Masaki, K., Rodriguez, B. L., Abbott, R. D., Burchfiel, C. C., Chen, A. R., et al. (1996). Peripheral artery disease and cardiovascular risk factors in the elderly:.The Honolulu Heart Program. *Arteriosclerosis, Thrombosis, and Vascular Biology*, *16*, 1495–1500.

Dawson, D. L., Cutler, B. S., Meissner, M. H., & Strandness, D. E., Jr. (1998). Cilostazol has beneficial effects in treatment of intermittent claudication: Results from a multicenter, randomized, prospective, double-blind trial. *Circulation*, *9*, 678–686.

Hirsch, A. T., Haskal, Z. J., Hertzer, N. R., Bakal, C. W., Creager, M. A., Halperin, J. L., et al. (2006). ACC/AHA Guidelines for the management of peripheral arterial disease. Available at http://content.onlinejacc.org/cgi/content/full/47/6/e1

Jaff, M. R., & Dorros, G. (1998). The vascular laboratory: A critical component required for successful management of peripheral arterial occlusive disease. *Journal of Endovascular Surgery*, *5*(2), 146–158.

Rothwell, P. M., Coull, A. J., Silver, L. E., Fairhead, J. F., Giles, M. F., Lovelock, C. E., et al. (2005). Oxford Vascular Study. Population-based study of event rate, incidence, case fatality, and mortality for all acute vascular events in all arterial territories. *Lancet*, *366*(9499), 1773–1783.

Selvin, E., & Erlinger, T. P. (2004). Prevalence of and risk factors for peripheral arterial disease in the United States: Results from the National Health and Nutrition Examination Survey, 1999–2000, *Circulation*, *110*(6), 738–743.

Sommerville, R., Jenkins, J., Walker, P., & Olivotto, R. (2005). 3-D magnetic resonance angiography versus conventional angiography in peripheral arterial disease: Pilot study. *Australian and New Zealand Journal of Surgery*, *75*, 373–377.

Weitz, J. I., Byrne, J., Clagett, G. P., Farkouh, M. E., Porter, J. M., Sackett, D. L., et al. (1996). Diagnosis and treatment of chronic arterial insufficiency of the lower extremities: A critical review. *Circulation*, *94*(11), 3026–3049.

Wildman, R., Munter, P., Chen, J., Sutton-Tyrell, K., & Jiang, H. (2005). Relation of inflammation to peripheral arterial disease in the National Health and Nutrition Examination Survey, 1999–2002. *American Journal of Cardiology*, *96*(11), 1579–1583.

PERSONALITY DISORDERS IN THE ELDERLY

A *personality disorder* is defined as “an enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to distress or impairment" (American Psychiatric Association, 2000). These disorders are coded on Axis II of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (*DSM-IV-TR*) and include 10 specific, diagnosable disorders. These disorders are subgrouped into three clusters. Cluster A includes the Paranoid, Schizoid, and Schizotypal Personality Disorders, all of which are associated with an odd or eccentric presentation. Cluster B includes the Antisocial, Borderline, Histrionic, and Narcissistic Personality Disorders, and, as a group, are characterized by intense and often chaotic interpersonal relationships and a dramatic or erratic presentation. Cluster C includes the Avoidant, Dependent, and Obsessive-Compulsive Personality Disorders and are associated with an anxious or fearful presentation (American Psychiatric Association, 2000).

Personality disorders in the elderly have received relatively little attention, yet they may seriously complicate the course and treatment of other psychiatric disorders and adversely affect quality of life (Abrams et al., 2001). Patients who present with personality disorders have long-standing difficulties in certain aspects of functioning, often experiencing chaotic interpersonal relationships, problems maintaining a stable sense of self, and deficits in coping with strong emotions. As a result, elderly persons with personality disorders may present with additional needs but, paradoxically, may have greater difficulty in accepting or making use of available resources.

Assessment of Personality Disorders in the Elderly

Diagnosing personality disorders in the elderly is a complex task due to the need to demonstrate the early age of onset and the difficulty in teasing apart functional impairments related to personality from those related to physiological and environmental aspects of aging. Although tools for assessing personality disorders exist, there is no ideal assessment instrument for geriatric personality disorders. Most instruments tend to be lengthy structured interviews that can overwhelm elderly subjects, and none of these instruments has been validated for elderly subjects.

Furthermore, although the *DSM-IV-TR* defines a personality disorder as an "enduring pattern," the presentation of these disorders may change over time, resulting in a different clinical picture in adolescents, adults, and the elderly. An influential longitudinal study by Vaillant described a process of maturation and a reduction of the detrimental effects of dysfunctional personality in men from age 18 to 65 (Vaillant & Milofsky, 1980).

Another question has been the relevance of some personality disorder criteria to elders' life experiences (Abrams, 1991). Older individuals have fewer opportunities to manifest recklessness or impulsivity, and dependency can be misinterpreted in the setting of real functional impairment. Younger adults with developmental tasks of separating from parents, establishing relationships, and functioning in the workplace differ from elders coping with loss and retirement. Difficulties in applying Axis II criteria have been suggested as the explanation for an unexpectedly large number of "Not Otherwise Specified" personality disorders in some elderly samples (Abrams, 1991).

Prevalence of Personality Disorders in the Elderly

Compared to a general adult population, the prevalence of personality disorders may be only slightly lower in older adults. Personality disorders at all ages appear to be concentrated among mood-disorder patients. However, subsyndromal personality disorders may affect a larger segment of the elderly population than is presently appreciated (Zweig & Hillman,1999). Rates of personality disorder in geriatric studies appear to be highest in depressives, about 31% among those with either major depression or dysthymia (Abrams, 1991).

Co-Morbidity With Depression and Anxiety

In mixed-age depressives, co-morbid personality disorders have been associated with younger age of depression onset, multiple depressive episodes, and longer duration of episodes. Anxiety disorders have been associated with high levels of neuroticism and also with some Cluster C traits, such as avoidance and dependence (Bienvenu & Brandes, 2005).

Co-Morbidity With Late-Life Schizophrenia or Delusional Disorder

Many patients with late-onset schizophrenia or delusional disorder have had pre-morbid paranoid or schizoid personality disorders, suggesting that the personality structure represented a risk factor for late-life psychosis (Black, Bell, Hulbert, & Nasrallah, 1988). The typical picture of the older individual with a Cluster A personality disorder is that of an eccentric loner or self-neglector who might eventually develop psychosis.

Pharmacological Treatment of Geriatric Personality Disorders

Because personality disorders represent a range of phenomena, psychopharmacological treatments have tended to target individual symptoms rather than whole entities. Thus, clinicians often prescribe second-generation antipsychotics when psychosis is present; mood stabilizers for affective fluctuations; and serotonin-enhancing antidepressants for low mood, suicidality, aggression, or obsessionality. These approaches appear to have had some success in moderating individual symptoms.

When Axis I and Axis II disorders coexist, treatment efforts are generally directed first to the Axis I disorder, which usually can be approached pharmacotherapeutically. However, drug treatment may be complicated by co-morbid personality disorders or symptoms that reduce adherence to pharmacological treatments.

Psychotherapy for Geriatric Personality Disorders

Psychotherapy with patients who have personality disorders is often complex, affectively charged, and difficult work, and this is no different with elderly patients. In fact, because of increased dependence, declining health, and the significant environmental changes that are often associated with aging, the elderly are perhaps more likely to have strong emotional reactions to their psychotherapist. Often, the task of the therapist is to develop an alliance with the patient, with the goal of looking collaboratively at ways in which the patient contributes to his or her difficulties. In elderly patients with no prior experience in psychotherapy, this may feel confusing, demanding, or even unfair.

Although traditional psychotherapies can be effective for elderly outpatients, the trend has been in favor of treatments using cognitive-behavioral approaches. Studies of these therapies in the elderly have mostly involved depressed patients, however, and their applicability to older adults with personality disorders has not been specifically evaluated.

As people age, changes in their health, their surroundings, and their relationships put increased demands on their coping mechanisms. Whatever these normative problems of aging may be, patients with personality disorders have greater difficulty managing these problems and using available resources effectively. Although overt self-destructive behavior such as self-mutilation is rare in this population, deficits in interpersonal skills and coping skills intersect with medical and psychiatric illness to accentuate the difficulties of aging. Recognizing and treating underlying personality disorders in the elderly is an important aspect of providing useful and effective care to those who are most in need.

Chaim E. Bromberg
Robert C. Abrams

Acknowledgments
American Philanthropic Foundation; Reynolds Foundation

See also

Dementia: Overview

Mild Cognitive Impairment: Controversy in Nomenclature and Treatment

Psychotic Disorders and Mania

Internet Resources

American Journal of Geriatric Psychiatry
http://ajgponline.org/

American Association for Geriatric Psychiatry
http://www.aagpgpa.org/

Borderline Personality Disorder Resource Center
http://www.bpdresourcecenter.org/

International Journal of Geriatric Psychiatry
http://www3.interscience.wiley.com/cgi-bin/jhome/4294/

International Society for the Study of Personality Disorders
http://www.isspd.com/

National Institutes of Health/MedlinePlus Personality Disorders page
http://www.nlm.nih.gov/medlineplus/personalitydisorders.html

REFERENCES

Abrams, R. C. (1991). The aging personality (editorial). *International Journal of Geriatric Psychiatry*, *6*, 1–3.

Abrams, R. C., Alexopoulos, G. S., Spielman, L. A., Klausner, E., & Tatsuyuki, T. (2001). Personality disorder symptoms predict declines in global functioning and quality of life in elderly depressed patients. *American Journal of Geriatric Psychiatry*, *45*, 111–119.

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text revision). Washington, DC: American Psychiatric Association.

Bienvenu, J., & Brandes, M. (2005). The interface of personality traits and anxiety disorders. *Primary Psychiatry*, *12*, 35–39.

Black, D. W., Bell, S., Hulbert, J., & Nasrallah, A. (1988). The importance of Axis II in patients with major depression: A controlled study. *Journal of Affective Disorders*, *14*, 115–122.

Devanand, D. P., Turret, N., Moody, B. J., Fitzsimons, L., Peyser, S., Mickle, K., et al. (2000). Personality disorders in elderly patients with dysthymic disorder. *American Journal of Geriatric Psychiatry*, *8*, 188–195.

Vaillant, G. E., & Milofsky, E. (1980). Natural history of male psychological health: IX. Empirical evidence for Erikson's model of the life cycle. *American Journal of Psychiatry*, *137*, 1348–1359.

Zweig, R. A., & Hillman, J. (1999). Personality disorders in adults: A review. In E. Rosowsky, R. C. Abrams, & R. A. Zweig (Eds.), *Personality disorders in older adults: Emerging issues in diagnosis and treatment* (pp. 31–54). Mahwah, NJ: Lawrence Erlbaum Associates.

PHARMACISTS

Medications are probably the single most important factor in improving the quality of life of older adults. However, these same medications can cause adverse effects, and older adults are at particular risk for medication-related problems. Consultant pharmacists have traditionally cared for elderly patients residing in nursing homes. As increasing numbers of older adults continue to reside in the community and in assisted-living facilities, the role of the pharmacist in geriatrics (or senior care) has expanded beyond the nursing home. The term *Senior Care Pharmacist* was coined by the American Society of Consultant Pharmacists (ASCP) to describe pharmacists who care for the elderly and have specialized knowledge about the use of medications in older adults. These pharmacists are advocates for their senior patients, wherever they reside.

Education and Training

Since 2000, the entry-level degree into the profession of pharmacy has been the 6-year Doctor of Pharmacy (PharmD) degree. Previously, the program of study was a 5-year bachelor of science in pharmacy.

Although there is no nationally required geriatric content in the pharmacy curriculum, several recent surveys have found that essentially all colleges of pharmacy contain some geriatric content, either in required courses or electives (Linnebur, et al. 2005). More than 90% of the colleges responding to the surveys offer experiential rotations in geriatrics or long-term-care pharmacy practice. To help colleges identify geriatric topics for the curriculum, ASCP published a Geriatric Curriculum Guide. This document lists geriatric topics and prioritizes them from Priority 1 (knowledge for all pharmacists) to Priority 3 (knowledge for a Senior Care Pharmacist specialist). The guide covers General Principles of Aging, Clinical Aspects of Disease, and General Pharmaceutical Care Principles. The appendices list disease states, syndromes, and special problems of concern in the elderly.

Postgraduate training programs exist for the pharmacist interested in specializing in geriatric pharmacy practice. In 2004, there were 20 residencies in geriatric pharmacy practice and 1 fellowship. Most of these training programs are based in university hospitals or long-term-care settings. The American Society of Health-System Pharmacists (ASHP) has established standards and learning objectives for residencies focused on geriatric pharmacy practice. ASCP and ASHP have jointly developed guidelines for pharmacy residencies based in long-term-care facilities. For practicing pharmacists, the ASCP Foundation offers intensive 5-day traineeships in various areas of geriatric pharmacy practice (e.g., Alzheimer's disease, Parkinson's disease, and wound care).

Licensure and Certification

After graduating from an accredited college of pharmacy, the individual must pass a state licensure examination. Every registered pharmacist must annually obtain a required amount of continuing education credits to renew and maintain his or her license. A few states require additional continuing education focused in geriatric care for pharmacists involved in long-term-care consultant practice.

In 1997, ASCP voted to create the Commission for Certification in Geriatric Pharmacy (CCGP) to oversee a certification program in geriatric pharmacy practice. Candidates are required to pass a 200-question examination and are then entitled to use the designation, Certified Geriatric Pharmacist (CGP). As of January 2006, there were approximately 1,300 Certified Geriatric Pharmacists, most of them in the United States. Certification is good for 5 years and recertification is through examination or a series of special continuing education programs.

Practice Settings and Roles

Pharmacists care for older adults in various settings: the community, hospitals, long-term-care facilities, assisted-living facilities, home care, and hospice. They are an essential member of the health care team caring for an elderly patient. They provide drug information to other members of the team, monitor drug therapy, and provide patient education. Through regular review of the patient's medication regimen, the pharmacist can ensure appropriate choice of medication and appropriate dosing based on organ function, screen for drug interactions and adverse effects, and recommend the discontinuation of unnecessary medications. Pharmacists are involved in clinical research in many patient settings and within the pharmaceutical industry.

Professional Organizations and Publications

ASCP is the international professional association that provides leadership, education, advocacy, and resources for pharmacists caring for older patients. The ASCP Foundation funds research and educational projects in geriatric pharmacy practice. One of its major initiatives has been the Fleetwood Project, a three-phase study documenting the value of pharmacists' services in long-term-care facilities. The final report of the Fleetwood Project was published in 2006. ASCP and the Foundation have developed student programming to increase interest in senior care among pharmacy students. Other pharmacy organizations, including ASHP, American Association of

Colleges of Pharmacy (AACP), and American College of Clinical Pharmacy (ACCP), have special-interest groups for pharmacists involved in geriatric practice.

There are several journals focusing on geriatric pharmacotherapy. ASCP's journal, *The Consultant Pharmacist*, is a monthly peer-reviewed publication that publishes practice-based research and review articles. *The American Journal of Geriatric Pharmacotherapy* was founded in 2003 to provide peer-reviewed articles focused on recent developments in geriatric drug therapy. *Drugs and Aging* is a quarterly journal also covering a wide range of geriatric drug topics.

Resources for Patients and Health Care Professionals

A common question is "How does one find a pharmacist specializing in geriatric care?" There are two Web sites listing pharmacists specializing in geriatric practice. SeniorCarePharmacist.com provides a geographical listing of pharmacists who voluntarily join the site. Each pharmacist provides a description of their practice and specialty areas (e.g., psychopharmacy, patient education) and contact information. On the CCGP Web site, all current Certified Geriatric Pharmacists are listed geographically with their contact information. Patients and health professionals are invited to visit these Web sites to find a Senior Care Pharmacist.

JUDITH BEIZER

Acknowledgment
The author is on the Medicare Part D pharmacy and therapeutics committee for MEDCO.

See also
Dementia: Pharmacological Therapy
Medication Adherence
Over-the-Counter Drugs and Self-Medication
Polypharmacy: Drug–Drug Interactions
Polypharmacy: Management
Psychotropic Medications in Nursing Homes

Internet Resources
American Society of Consultant Pharmacists
www.ascp.com

ASCP Foundation
http://www.ascpfoundation.org
http:/www./ascp.com/public/meetings/curriculum/

ASHP/ASCP Standards for Residencies in Long-Term-Care Pharmacy Practice
http://www.ascp.com/public/pr/residency/goals.shtml

http://www.ashp.org/rtp/geriatric-stnd.cfm?cfid=1546335&CFToken=46641835

Commission for Certification in Geriatric Pharmacy
http://www.ccgp.org

SeniorCarePharmacist.com
http://www.Seniorcarepharmacist.com

REFERENCES

McCord, A. D., Kennedy, D. H., DeMaagd, G., Dent, L. A., Splinter, M. Y., Biery, J., et al. (2005) Pharmacy practice, research, education and advocacy for older adults. *Pharmacotherapy*, *25*(10), 1396–1430.

PHYSICAL FUNCTION

See
Measuring Physical Function

PHYSICAL THERAPISTS

The Office of the Surgeon General established physical therapy during World War I through the Division of Special Hospitals and Physical Reconstruction. More than 2,000 "reconstruction aides" restored function to patients with poliomyelitis and other disabilities (Murphy, 1995). Conditions that limit function affect one in seven Americans, with the cost of care approaching more than $170 billion annually. Physical therapy services are, therefore, an integral component of an interdisciplinary care team dedicated to meeting the needs of elders with functional limitations.

More than 155,000 physical therapists (PTs) currently practice in the United States and provide care to more than 1 million clients per day. The minimum educational requirement is a master's degree in physical therapy, yet most educational programs offer a Doctor of Physical Therapy (DPT). Physical therapists must have both a graduate degree from a program accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE) and the American Physical Therapy Association (APTA). In 2004, there were 205 accredited physical therapy programs in the United States: 111 colleges and universities offered doctoral degrees and 94 offered master's degrees. Candidates must pass a state-administrated examination, but if a candidate's score is high enough, some states honor licensure granted by other states.

A physical therapist assistant (PTA) assists PTs in procedures and tasks delegated by a supervising PT (American Physical Therapy Association [APTA], 2001). PTAs attend one of 234 accredited PTA programs across the country and after 2 years graduate with an associate's degree. The PT is directly responsible for the actions of the PTA (APTA, 2001).

The American Board of Physical Therapy Specialties (ABPTS) certifies PTs who have acquired specialized knowledge and have extensive clinical experience in geriatrics through the APTA. Geriatric clinical specialists must have a minimum of 2,000 hours of direct patient care before they can apply to take the geriatric clinical specialist's exam. In 2005, there were 684 certified geriatric clinical specialists in the United States.

The diversity of settings in which geriatric PTs practice—hospitals, homes, physical therapy offices, rehabilitation facilities, subacute care facilities, nursing homes, hospice, fitness centers, integrative care centers, geriatric sports centers, academic and research centers—reflects the versatility of their skill and knowledge base. PTs specializing in geriatrics take a comprehensive approach when caring for older patients with acute or chronic illnesses that limit function. Physical therapy assessments are not standardized and may vary according to practitioner, as well as the locus of care.

Physical therapy, as defined by the state practice acts and adopted by the APTA, involves examining patients with impairments, functional limitations, and disabilities to determine a diagnosis, prognosis, and intervention; alleviating impairments and functional limitations by designing, implementing, and modifying therapeutic interventions; preventing injury, impairments, functional limitation, and disability, including the promotion and maintenance of fitness, health, and quality of life; and engaging in consultation, education, and research.

Major sources of reimbursement for physical therapy in the geriatric population are health maintenance organizations, Medicare, and Medicaid. Both managed-care companies and Medicare cap the number of PT visits, depending on diagnoses. In many states, patients have direct access to PTs without a physician's referral. The APTA lists those states that allow direct access to physical therapy services on its Web site.

It is projected that by 2020, between 9.7 million and 13.6 million older people will have moderate to severe functional disability. PTs provide care through direct intervention and to individuals who are not necessarily ill but may benefit from professional consultation with a PT. Physical therapy services for elders focus on rehabilitation, including the treatment of impairments and many functional limitations that lead to disability.

PTs examine and perform comprehensive evaluations based on an older patient's past medical history, current diagnosis, functional impairment, disability, and review of relevant systems. Specific tests provide baseline data regarding the patient's cardiovascular, neurological, pulmonary, and musculoskeletal systems. Evaluations performed by a PT may include but are not limited to motor function, joint integrity and mobility, range of motion, muscle performance, posture, gait and balance, pain, neuromotor development, sensory integration, aerobic endurance, ventilation, respiration, and circulation evaluations. Data obtained during the evaluation determine which individualized interventions are likely to produce desired changes in the patient's condition. The patient, PT, and other members of the health care team (e.g., occupational therapist, geriatrician, social worker, geriatric nurse practitioner) determine the plan of care and goals of treatment.

The goal of therapy services can be to either restore or maintain function. For restorative services, Medicare requires that therapy be provided by a PT or PTA and that there be significant progress in function in a predictable period. The goal of maintenance physical therapy is to maintain the patient's present level of function. Generally, Medicare or managed care does not reimburse maintenance physical therapy. Although there is no standard duration of treatment for events such as stroke resulting in hemiparesis or hip fracture, the *Guide to Physical Therapist Practice* lists the expected number of visits per episode of care for many diagnoses (APTA, 2001).

The model of physical therapy is evidence-based practice that uses clinical experience and concomitant external evidence such as research reports, clinical practice guidelines, and quality indicators. By integrating such data into clinical practice, PTs are working to incorporate newly acquired information into higher quality care for older patients (Levi, 1999).

Sandra B. Ganz

See also
Rehabilitation
Physical Therapy Services

Internet Resources
American Physical Therapy Association
http://www.apta.org

APTA Section on Geriatrics
http://geriatricspt.org

REFERENCES

American Physical Therapy Association (2001). Guide to physical therapist practice. *Physical Therapy*, *81*, 23–163.

Levi, S. J. (1999). Evidence-based practice: Systemic reviews, critical reviews. *Archives of Physical Medicine and Rehabilitation*, *6*(5), 1–4.

Murphy, W. (1995). *A history of physical therapy and the American physical therapy association*. Washington, DC: American Physical Therapy Association.

PHYSICAL THERAPY SERVICES

The treatment of older patients, with and without active pathology, challenges physical therapists because of the myriad functional impairments and limitations commonly seen in the elderly. The goals of physical therapy are to alleviate pain; prevent the onset and progression of physical impairment, functional limitation, disability, or changes in physical function and health status that result from disease or injury; and restore, maintain, and promote general fitness, health, and quality of life (American Physical Therapy Association [APTA], 2001; Guccione, 2000).

Physical therapists, who must be accredited, integrate five key elements of practice to maximize functional outcomes: examination, evaluation, diagnosis, prognosis, and intervention. These elements guide physical therapists toward the desired outcome. The three-part examination consists of patient history, systems review, and specific tests and measurements (APTA, 2001; Guccione, 2000).

History

A PT obtains a patient's health status, both past and present, and identifies specific complaints, along with health-risk factors and concomitant problems that have implications for therapeutic intervention. Data obtained from a patient history may include general demographics, social history, occupation or employment, medications, living environment, history of current condition, functional status and activity level, laboratory and diagnostic tests, and past medical and surgical history. It should also include a family history, self-reported health status, and cognitive and communication ability (APTA, 2001).

Systems review

Systems-review information assists therapists in formulating a diagnosis, prognosis, plan of care, and appropriate interventions. A physical therapist may review the cardiopulmonary, integumentary, musculoskeletal, and neuromuscular systems (APTA, 2001).

Specific tests and measures

After synthesizing all pertinent information from the history and systems review, a physical therapist determines which tests and measures will elicit additional information. A thorough physical examination should include a functional assessment of upper-extremity function, bed mobility and transfer status, observational gait analysis, strength and range of motion, posture assessment, cognitive and perceptual evaluation, as well as a patient's ability to perform basic activities of daily living (BADLs).

Upper-extremity function is measured by the patient's ability to perform hand-to-mouth activities, finger dexterity, dressing, grooming, hygiene, and the ability to use appropriate assistive devices for ambulation. Rolling is an important aspect of bed mobility; and patients who are unable to reposition themselves in bed risk developing pressure sores. If patients are unable to independently roll from side to side, they may use a transfer enabler such as a bed bar.

Transfer status refers to the ability to perform movements to and from various heights and surfaces, such as transferring in and out of bed; on and off a chair, wheelchair, or toilet; and in and out of the bathtub. Adaptive or durable medical equipment helps make transfers safe if a patient is unable to transfer independently. A sliding board helps transfers from bed to wheelchair, and a drop-arm commode helps patients unable to make the multiple transfers necessary between bed and toilet. A transfer tub bench may be helpful for transfers in and out of the tub, although it depends on a patient's sitting balance ability.

Observational gait analysis determines ambulation status—cadence, velocity, and step height. If a patient ambulates with an assistive device such as crutches, walker, or cane, the assessment includes evaluating walking technique and determining whether the assistive device is the correct height and used properly (Tinetti, 1986).

Strength is evaluated through manual muscle-testing techniques that determine the extent and degree of muscular weakness resulting from disease, injury, or disuse. Therapeutic exercise can help strength deficits. Range of motion is the ability of a joint to move through a complete arc of motion. Most movements of the extremities are measured in degrees from a specified starting point. Although normative ranges have been established for adults, few data are available on normative ranges for the geriatric population. As a result of the aging process, range of motion decreases; therefore, it is important for therapists to distinguish between normal range of motion and functional range of motion. In cases of functional impairment with a concomitant decrease in range of motion, an appropriate therapeutic exercise program may increase range of motion (Guccione, 2000).

Posture assessments are routinely performed with a musculoskeletal exam to ascertain whether a patient has any postural deformities that are influencing his or her functional status. Standing posture is a simple way to evaluate balance. Is the patient standing with or without support from an external device such as a cane? Is the patient's base of support wide or narrow? A wide base of support indicates decreased stability in the upright position.

Included in geriatric physical therapy functional assessment are performance-based measures such at the Tinetti Gait and Balance Assessment (Tinetti, 1986), Functional Reach (Duncan, Weiner, Chandler, & Studenski, 1990), and Timed "Get Up and Go" Test (Podsiadlo & Richardson, 1991), and the Berg Balance Test (Berg, Wood-Dauphinee, Williams, & Gayton, 1989). All these evaluative tools provide the therapist with a baseline and ongoing status.

Sandra B. Ganz

See also

Balance
Falls Prevention
Gait Assessment Instruments

Internet Resources

American Physical Therapy Association (APTA)
http://apta.org

APTA Section on Geriatrics
http://geriatricspt.org

The Hospital Bed Safety Workgroup
http://www.fda.gov/cdrh/beds/

REFERENCES

American Physical Therapy Association (2001). Guide to physical therapist practice. *Physical Therapy*, *81*, 21–25.

Berg, K., Wood-Dauphinee, S., Williams, J. I., & Gayton, D. (1989). Measuring balance in the elderly: Preliminary development of an instrument. *Physiotherapy Canada*, *4*(6), 304–311.

Duncan, P. W., Weiner, D. K., Chandler, J., & Studenski, S. (1990). Functional reach: A new clinical measure of balance. *Journal of Gerontology*, *45A*(6), M192–M197.

Guccione, A. (2000). *Geriatric physical therapy*. St. Louis, MO: Mosby Publishing Company.

Podsiadlo, D., & Richardson, S. (1991). The Timed "Up and Go": A test of basic functional mobility for frail elderly persons. *Journal of the American Geriatrics Society*, *39*(2), 142–148.

Tinetti, M. E. (1986). Performance-oriented assessment of mobility problems in elderly patients. *Journal of American Geriatrics Society*, *34*(2), 119–126.

PHYSICIAN-ASSISTED SUICIDE AND EUTHANASIA

Physician-assisted suicide (PAS) and euthanasia are contentious issues in the United States. With the implementation of the Death with Dignity Act in 1997, Oregon became the first and thus far only state to legalize PAS. Despite its illegality, approximately one in five physicians receives a request for an assisted death, and these requests are fulfilled to varying degrees.

"Euthanasia" comes from the Greek and means the "good death." In this discussion, the use of the term *euthanasia* refers to *voluntary active euthanasia*—that is, the intentional termination of one's life at his or her request as performed by someone other than the patient. PAS, on the other hand, requires that the patient actually perform the final act of taking the lethal dose of medication that has been prescribed by a physician. *Physician aid in dying* is an umbrella term that encompasses both euthanasia and PAS.

Arguments for and Against Physician-Assisted Dying

The primary ethical principle utilized in arguments in favor of physician aid in dying is that of patient autonomy. Patients have the right to express their wishes regarding life-sustaining treatments, resuscitation, and all other potential therapies, and it is well established that withdrawing life-prolonging treatments in accordance with the patient's wishes is ethically no different than withholding treatments. Proponents argue that this autonomy extends to having access to physician aid in dying. In addition, proponents posit that implicit in the physician's duty to alleviate uncontrollable suffering is the obligation to assist a patient in dying.

Opponents of physician aid in dying highlight the concern that legalization of physician-assisted deaths will create a practice environment more accepting of potential abuse (i.e., involuntary euthanasia). They also argue that legalization might result in tiered care, with vulnerable and marginalized patients opting for an assisted death as a result of subtle pressures from the medical establishment.

Oregon's Death with Dignity Act

Ethical questions previously relegated to mere speculation became real issues of clinical practice in November 1997 with the implementation of Oregon's Death with Dignity Act (ODDA). Now, with seven years of collective experience under ODDA, there is a more informed view of the practice of PAS, including the prevalence of requests, reasons for requests, and outcome of these patients.

Under ODDA, a patient with a terminal prognosis (i.e., expected death within 6 months) may request from their physician a prescription for lethal medication that the patient then self-administers. A consulting physician must confirm the patient's prognosis. The patient must make two oral requests and one written request during a 15-day period. If either the primary or consulting physician is concerned that the patient may have a mental disorder resulting in impaired judgment, referral to a mental health professional is required. In addition, the patient must be informed of alternatives such as hospice and palliative care.

Between November 1997 and December 2004, 208 patients died after ingesting a lethal dose of medication prescribed under ODDA. Physicians have written 326 prescriptions for lethal medications during the same period. Patients participating in PAS are more likely to be younger, divorced, or never married, and are more likely to hold a baccalaureate degree or higher. Rates of participation in PAS were highest among patients with amyotrophic lateral sclerosis, HIV/AIDS, and cancer. When physicians were asked to identify, based on discussions with patients, concerns of patients that may have contributed to their request for aid in dying, physicians most frequently cited a decreasing ability to participate in activities that make life enjoyable (92%), losing autonomy (87%), and loss of dignity (78%) (Oregon Department of Human Services, 2005).

Although the number of patients participating in PAS has trended upward in the 10 years since legalization of ODDA, the number of deaths resulting from PAS still remains relatively small in comparison to the total number of deaths in Oregon. In 2004, approximately 1 in 800 deaths among Oregonians resulted from PAS.

Requests for Aid in Dying

Although there is much to glean from the Oregon experience under ODDA, the majority of health care practitioners in the United States care for patients in environments where physician aid in dying is illegal. In 1996, Meier et al. conducted a national survey of 3,102 physicians practicing in 1 of 10 specialties in which doctors are most likely to receive requests from patients for aid in dying. Of the 1,902 respondents, 18.3% reported having received a request for PAS since entering practice, and 11.1% had received a request for euthanasia. Despite legal constraints, 3.3% of the 1,902 respondents reported having written at least one prescription to be used to hasten death, and 4.7% had administered at least one lethal injection (Meier et al., 1998).

Surveys of nonphysician health care professionals including nurses and social workers have found that requests for euthanasia and PAS may be even more common among these groups. Only one study has focused on practitioners specifically caring for the older adult. This survey of 100 New York gerontological nurses found that 43% had received requests for assistance in dying from either a patient or a family member (Beder, 1998).

Responding to Requests

Whether practicing in Oregon or elsewhere in the United States, responding to requests by patients or family members for aid in dying requires knowledge not only of the law but, more important, of other options for patients living with serious illness. Such a request should be regarded as an extreme cry for help and should prompt further discussions with patients about their fears and concerns. By eliciting these reasons behind the request, the provider will better understand the nature of the patients' suffering and may provide alternatives to alleviating it other than suicide.

Among the options for patients with serious illness are palliative care and hospice programs, and these should be discussed with patients and caregivers upon a request for assistance in dying. Palliative care focuses on pain and symptom management for patients with serious illness while also addressing emotional, spiritual, and existential suffering that may be present. Palliative-care providers also provide support for patients' caregivers and are helpful in establishing goals of care based on patients' stated wishes. A patient can receive palliative care while still undergoing active treatment for the underlying disease. Hospice is a benefit of Medicare as well as many private insurers that provides palliative care in the home (as well as other settings) to patients with life-limiting illness.

With aggressive palliative care, including expert pain and symptom management as well as attention to a patient's psychological, social, and spiritual well-being, providers can promote an improved quality of life for their patients. Palliative care can address many of the fears and concerns expressed by patients requesting assistance in dying. With better pain and symptom control, patients may be better able to participate in enjoyable activities. By engaging patients in discussions about their goals and values, providers can engender a great sense of dignity and autonomy in patients with serious illness. By addressing patients' fears and concerns and by managing their physical symptoms, providers can effectively respond to these requests for assistance in dying and obviate the patient's perceived desire to die.

As health care providers across the United States continue to receive requests for aid in dying, it is imperative that energies are focused on the suffering of patients and on those interventions that can be employed to help alleviate suffering. In so doing, patients will be allowed to live their remaining days with dignity and an acceptable quality of life—one in which euthanasia and PAS are not seen as the only option.

LYNN BUNCH
R. SEAN MORRISON

See also
Autonomy
Palliative Care
Suicide

Internet Resources

ACP-ASIM End-of-Life Care Consensus Panel
http://www.acponline.org/ethics/eolc.htm

Center for Ethics in Health Care, Oregon Health & Science University
http://www.ohsu.edu/ethics/guide.htm

Education in Palliative and End-of-Life Care (EPEC)
http://www.epec.net

The End-of-Life Nursing Education Consortium (ELNEC) http://www.aacn.nche.edu/elnec/

The End-of-Life Physician Education Resource Center
http://www.eperc.mcw.edu

REFERENCES

Beder, J. (1998). Legalization of assisted suicide: A pilot study of gerontological nurses. *Journal of Gerontological Nursing*, *24*(4), 14–20.

Meier, D. E., Emmons, C. E., Wallenstein, S., Quill, T., Morrison, R. S., & Cassel, C. K. (1998). A national survey of physician-assisted suicide and euthanasia in the United States. *New England Journal of Medicine*, *338*, 1193–1201.

Oregon Department of Human Services (2005). Seventh Annual Report on Oregon's Death with Dignity Act. Available at http://egov.oregon.gov/DHS/ph/pas/docs/year7.pdf

PODIATRIC MEDICINE

Podiatric medicine is concerned with diagnosing and treating conditions affecting the human foot and ankle and their governing and related structures.

Podogeriatrics focuses on the prevention, education, and treatment of foot and related diseases, disorders, disabilities, deformities, and complications occurring in later life. Foot conditions may be local in etiology or result from complications associated with multiple chronic diseases, such as diabetes mellitus, peripheral arterial disease, and various forms of arthritis, as well as changes associated with the aging process itself. Given that older persons tend to react to illness, deformity, and disease differently from younger persons, caring for geriatric patients must include an understanding of both the specific syndromes that older patients experience and team skills.

Foot problems occur universally. By age 65, almost 90% of the population has had one or more foot problems that caused some level of ambulatory dysfunction or functional disability. Some factors contributing to the development of foot problems in older patients include ambulatory dysfunction, prior hospitalization, manifestations of systemic disease, mental status change and drug sensitivity, and increased susceptibility to local infection due to neurovascular impairment. Most older patients and those with chronic diseases such as diabetes mellitus, peripheral arterial insufficiency, and the various forms of arthritis exhibit foot complaints. Many chronic systemic diseases are first manifest by foot symptoms (Helfand, 2003, 2006b).

The ability to walk pain-free enhances an active lifestyle in elderly and chronically ill patients. Concern about the prevention and early detection of disease, deformity, and disability, as well as the ability to stratify risk, reduces the prevalence of foot disability in later life (Helfand & Jessett, 2006). Programs for older patients must focus on prevention—primary, secondary, and tertiary—and offer comprehensive services and access based on patient need, with the goals of providing quality care and maintaining the quality of life.

Education

Doctors of podiatric medicine are licensed to practice in all states and the District of Columbia. Attaining this degree requires 4 years of academic study at a school or college of podiatric medicine accredited by the Council on Podiatric Medical Education of the American Podiatric Medical Association, preceded by pre-professional education.

Primary training in clinical geriatrics is completed through the first professional degree and residencies. Continuing-education programs provide additional training, and fellowships enhance clinical knowledge by focusing on academic elements. Many podiatrists are in solo or small-group practices, but interdisciplinary team care is expanding.

The basic education at the eight schools or colleges of podiatric medicine provides a core curriculum in the basic medical sciences. In addition, the basic clinical aspects of podiatric and medical care are covered, including biomechanics, pathomechanics, medicine, gerontology, and clinical podiatric medicine. Didactic clinical education includes medical areas such as peripheral vascular disease, neurology, dermatology, podiatric surgery, and public and preventive health. Practical clinical education includes ambulatory clinical care, inpatient hospital care, clerkships, and institutional externships, including long-term care. A significant segment of clinical education is provided through affiliations with the Department of Veterans Affairs.

The core program prepares new practitioners for their roles as primary providers of foot care and prepares students for educational programs beyond the first professional degree, such as residencies, fellowships, graduate education, and continuing education. Each state prescribes the requirements for licensure and may include examinations provided by the National Board of Podiatric Medical Examiners or appropriate examinations or endorsements provided by the various state licensing agencies.

Podiatric Medical Management

Care provided by podiatric physicians includes services for ambulatory patients, hospitalized patients, and those in long-term-care settings (Helfand, 2006a). Education, preventive services, and assessment may also be provided as a part of community and agency programs. Generally, care components include the history, physical examination, assessment, risk stratification, radiographs, laboratory studies, and other special diagnostic tests, such as those related to biomechanics, pathomechanics, neurological, and vascular analysis.

Neurological, vascular, musculoskeletal, dermatologic, onychial, and other related conditions should be managed primarily, with appropriate consultation. Débridement, pathomechanical, orthopedic, biomechanical, radiographic, orthotic, surgical, primary podiatric medical, and dermatological procedures are elements of total patient management (Helfand & Jessett, 2006). Conservative as well as surgical management are within the purview of podiatry. Health education, preventive services, assessment, and surveillance should be a major component of care for older patients.

Reimbursement

Third-party reimbursement for podiatric services is similar to Medicare reimbursement. In 1967, podiatrists were included in the Medicare regulations and considered physicians with respect to the services they are legally authorized to perform by the state (Section 1861r, Social Security Act) (Helfand, 2006a). Certain types of treatment or foot care are excluded, whether performed by a doctor of medicine, doctor of osteopathic medicine, or doctor of podiatric medicine (Helfand, 2003, 2006a). These exclusions are generally defined as routine foot care in the absence of localized illness, injury, or symptoms involving the foot. Services are covered when systemic conditions such as metabolic, neurological, or peripheral vascular disease result in circulatory compromise, or areas of diminished sensation in the feet or legs and evidence documents that inappropriate care would be hazardous for the patient because of underlying systemic disease. Examples of covered diseases include peripheral arterial disease, diabetes mellitus, peripheral neuropathy, and multiple sclerosis.

Pain alone is not an indication for coverage. Patients must be under active care of a primary care physician or specialist for the covered medical conditions and present with findings such as nontraumatic amputation, edema, absent pulses, claudication, trophic changes in hair growth, thickened toenails, skin changes, decreased temperature, and/or cyanosis.

Because the vast majority of foot problems in older patients are chronic and related to systemic disease, it is important that management include continuing surveillance, assessment, and care.

Arthur E. Helfand

See also
Foot Problems

Internet Resources
American Podiatric Medical Association
http://www.apma.org/

National Institute for Aging
http://www.niapublications.org/engagepages/footcare.asp

REFERENCES

Armstrong, D. G., & Lavery, L. A. (2005). *Clinical care of the diabetic foot*. Alexandria, VA: American Diabetes Association.

Helfand, A. E.,(2003). Clinical Podogeriatrics: Assessment, Education and Prevention, Clinics in Podiatric Medicine and Surgery. Philadelphia, PA: W. B. Saunders, Co.

Helfand, A. E. (2006a). *Public health and podiatric medicine: Principles and practice* (2nd ed.). American Public Health Association Press.

Helfand, A. E. (2006b). Diseases and disorders of the foot. In P. Pompei & J. B. Murphy (Eds.), *Geriatric review syllabus: A core curriculum in geriatric medicine* (6th ed.). New York: American Geriatrics Society, Blackwell Publishing.

Helfand, A. E., & Jessett, D. F. (2006). Foot Problems in the Elderly. In M. S. J. Pathy (Ed.), *Principles and practice of geriatric medicine (4th ed.)*. Edinburgh: John Wiley & Sons.

Merriman, L. M., & Turner, W. (2002). Assessment of the lower limb (2nd ed.). London: Churchill Livingstone, Elsevier.

Turner, W. A., & Merriman, L. M. (2005). Clinical skills in treating the foot (2nd Ed.) London: Churchill Livingstone, Elsevier.

POLYPHARMACY: DRUG–DRUG INTERACTIONS

Polypharmacy is the use of five or more chronic medications, although some define it as the long-term simultaneous use of two or more drugs (Juurlink, Mamdani, Kopp, Laupacis, & Redelmeier, 2002). Older people take more prescription and over-the-counter (OTC) medications than younger people. Although those older than 65 years constitute only 12% of the population, they consume 30% of all prescribed drugs. Some medications are absorbed, distributed, metabolized, and excreted (i.e., pharmacokinetics) differently in the elderly, and the action of drugs (i.e., pharmacodynamics) may be exaggerated or diminished. Of special significance in the geriatric population, different drugs interact with each other either by pharmacokinetic inhibition or induction of drug metabolism or by pharmacodynamic potentiation or antagonism. Knowledge of these pharmacological pathways has a profound impact on the quality of geriatric medical care.

Polypharmacy mishaps in the elderly occur for numerous reasons. Older patients often have multiple providers, who may be unaware of one another's new prescriptions or medication changes, especially after hospitalization. Older patients often have visual and cognitive impairments that lead to errors in self-administration. Patients who are unable to afford to take all of their medicines consistently may be too embarrassed to tell their providers and may overdose when they take all medicines as prescribed. Functional illiteracy, which is not uncommon among the elderly, makes adherence to a medical regimen difficult. Finally, the average clinician is not knowledgeable about the vast number of possible drug interactions. Computer databases may not reflect all interactions or may show too many, making it difficult to identify the clinically important ones.

Although changes in drug metabolism in the healthy elderly are often minimal and not clinically significant, the clinical impact of these changes in older people with kidney or liver disease can be considerable. Adverse drug reactions are two to three times more likely to occur in older patients. In general, drug absorption is complete in older persons, although it often occurs at a slower rate. Bioavailability, the fraction of an oral drug reaching the systemic circulation, depends on absorption and first-pass metabolism. Some drugs have increased bioavailability in the elderly (e.g., labetalol, levodopa, nifedipine, and omeprazole).

Drug distribution can change due to age-related alterations in body composition. Weight is reduced, percentage of body fat is increased, and total body water and lean mass are decreased. Hydrophilic drugs have a higher concentration because they are distributed in a smaller volume of body water. Lipophilic drugs have a larger volume of distribution and a longer half-life because they are distributed in a larger volume of fat. Decreased albumin and other binding proteins may or may not affect the active drug (free) concentration.

Hepatic metabolism varies greatly among individuals based on age, sex, lifestyle, hepatic blood flow, presence of liver disease, and other factors. Although enzymes are usually unchanged by aging, many drugs are metabolized more slowly in older people due to a reduction in hepatic blood flow. Renal excretion of drugs diminishes by 35% to 50% due to decreased glomerular filtration rate (GFR). However, because of decreased muscle mass, measurement of serum creatinine does not reflect GFR, and many formulas to estimate creatinine clearance based on age, weight, and creatinine are inaccurate. Obtaining a 24-hour urine collection for creatinine clearance is the most accurate way to estimate GFR. The approach to medication dose reduction for geriatric patients is similar to that for patients with kidney dysfunction.

These age-related pharmacokinetic changes result in a longer drug half-life, a diminished clearance, and a longer time to reach a steady state. This is reflected in different serum levels for a given dose. Because of age-related pharmacodynamic changes, drugs have a different effect at the same serum level. For example, opioids have a greater analgesic effect, benzodiazepines have a greater sedative effect, and anticoagulants are associated with a higher risk of bleeding. Beta-blockers, in contrast, are less effective in the elderly (Maskalyk, 2002).

Drug–Drug Interactions

When more than one drug is taken, age-related pharmacokinetic and pharmacodynamic considerations may complicate the drug interactions. Some interactions result in less drug being available through the mechanisms of impaired absorption, induced hepatic enzymes, and inhibition of cellular uptake. Impaired absorption can be due to binding by a concurrently administered drug, such as cholestyramine-binding digoxin and thyroxine. Administering these drugs 2 hours apart helps minimize this interaction.

Certain drugs induce hepatic metabolic enzymes in the cytochrome P-450 system (CYP). It may take weeks for these enzymes to become maximally active. Increased enzyme supply breaks down the active drug and causes less drug delivery. This occurs with drugs such as phenobarbital, rifampin, and phenytoin. Smoking and chronic alcohol use can induce similar effects. Hepatic enzyme induction results in lower levels of warfarin, quinidine, verapamil, cyclosporine, methadone, and many other medications. Inhibition of cellular uptake or binding may produce less drug availability. The interaction of clonidine and tricyclic antidepressants occurs through this mechanism, diminishing efficacy of both drugs.

Interactions that result in more drug availability include inhibition of metabolic enzymes and inhibition of renal excretion. Inhibition of metabolism leads to increased half-life, accumulation of the drug, and potential toxicity. Inhibition, unlike induction, can occur immediately. The recent understanding of the mixed function oxidase system and its isoforms allows prediction of potential interactions. For example, CYP-3A metabolizes cyclosporine, quinidine, lovastatin, warfarin, nifedipine, lidocaine, astemizole, cisapride, erythromycin, methylprednisolone, carbamazepine, and triazolam. Many of these medications are also inhibitors of the same CYP oxidase system. Cyclosporine can reach toxic levels if coadministered with erythromycin. A well-known interaction involving CYP-3A is cisapride with ketoconazole, which can produce a polymorphic ventricular tachycardia. CYP-2D6 is inhibited by quinidine and blocks the conversion of codeine to morphine, which makes codeine less effective (Wilkinson, 2005). Inhibition of renal excretion causes more drug availability. For example, probenecid inhibits the excretion of penicillin. Clinicians can utilize this interaction to prolong the half-life of penicillin.

The newly identified drug efflux transporter P-glycoprotein (P-gp) can be inhibited or induced by drug interactions. Drugs that affect CYP-3A4 are likely to affect P-gp. Many drugs, including digoxin, nonsedating antihistamines, cyclosporine, some protease inhibitors, and some anticancer drugs, require this transporter in the gastrointestinal tract, liver, and kidney for excretion to occur (Kim, 2002).

Pharmacodynamic interactions are those in which the actions of the different drugs affect the same end point. Warfarin and aspirin interact by increasing the likelihood of bleeding through separate pathways. Similarly, warfarin and nonsteroidal anti-inflammatory drugs make gastrointestinal bleeding more likely. NSAIDs also raise blood pressure and may undermine the action of antihypertensive agents (Feely & Barry, 2005).

Managing a Patient on Multiple Medications

With careful attention to the drug regimen, physicians, nurses, pharmacists, and older patients themselves can reduce the risk of serious drug–drug interactions.

- Be aware of all medications the patient is taking, including OTCs, vitamins, and herbal remedies. One method is to ask patients to bring all their medications to each office visit ("the brown paper bag"). The practitioner may be surprised by the medications other providers have prescribed, by old prescriptions still being refilled at the pharmacy, and by the range of OTC drugs the patient is using. Another approach to avoid polypharmacy is to provide older patients with a "medication passport" that lists all medicines they are taking. The patient shows this list to subspecialists and to the primary provider at each visit.
- Start all new medications at low doses and increase the strength slowly (i.e., "start low and go slow"). Limit the number of medications to as few as necessary, and routinely review all drugs.

Attempt to withdraw any unnecessary agents and, in some cases, consider nondrug therapy.

- Be cautious with newly released drugs. Report any adverse reactions, working closely with pharmacists, drug manufacturers, and public health departments. Investigate all complaints because they may point to drug–drug interactions. Drug toxicity and drug interactions should be part of the differential diagnosis for altered mental status, fatigue, incontinence, gait disorder, and many other geriatric syndromes.
- Institute plans to monitor drug treatment programs on a regular basis in institutional settings.
- In the home setting, use reminders, pillboxes, and other memory aids to reduce errors and enhance compliance. Attention to the patient's individual needs, with compensation for any specific functional or cognitive impairment, is critical. Family members and personal caregivers should be trained to monitor medication adherence and to report any difficulties.
- Use computer databases and other drug-interaction resources to check for known interactions. If the pharmacy has such a system, it should have a record of all medications the patient is taking, even those supplied elsewhere.
- Avoid giving a medication to counter the effects of another medication—for example, giving anti-Parkinsonian medication to treat the rigidity caused by antipsychotics or metoclopramide. The best approach is to lower the dose or substitute another agent for the offending one.
- Check for food–drug interactions, such as grapefruit juice potentiating buspirone or felodipine.

Barrie L. Raik

See also
Polypharmacy: Management

Internet Resources

Physician's Desk Reference Online
http://www.pdr.net/index.html

Preventable Adverse Drug Reactions: A Focus on Drug Interactions
http://www.fda.gov/cder/drug/drugReactions/default.htm#Types%20of%20Drug%20Interactions

U.S. Food and Drug Administration Center for Drug Evaluation and Research
http://www.fda.gov/cder/consumerinfo/druginteractions.htm

REFERENCES

Feely, J., & Barry, M. (2005). Adverse drug interactions. *Clinical Medicine*, *5*, 19–22.

Juurlink, D. N., Mamdani, M., Kopp, A., Laupacis, A., & Redelmeier, D. A. (2003). Drug–drug interactions among elderly patients hospitalized for drug toxicity. *Journal of American Medical Association*, *289*, 1652–1658.

Kim, R. B. (2002). Drugs as P-glycoprotein substrates, inhibitors, and inducers. *Drug Metabolism Reviews*, *34*, 1–2, 47–54.

Maskalyk, J. (2002). Grapefruit juice: Potential drug interactions. *Canadian Medical Association Journal*, *167*, 279–280.

Wilkinson, G. R. (2005). Drug metabolism and variability among patients in drug response. *New England Journal of Medicine*, *352*, 2211–2221.

POLYPHARMACY: MANAGEMENT

Polypharmacy is the concurrent use of multiple medications or the use of more medications than are clinically indicated (Stewart & Cooper, 1994). Older adults are especially at risk for polypharmacy because large numbers of medications are prescribed to treat diseases of aging. Individuals 65 years and older comprise 13% of the U.S. population but consume more than one-third of all prescription medications.

Medications are essential to the health and quality of life of older adults; however, the adverse health outcomes associated with the inappropriate use of medications are considerable and often result in serious harm, even death (Gurwitz & Rochon, 2002). As the number of medications a person uses increases, so does the likelihood of inappropriate prescribing, adverse drug events, drug interactions, and costs. In addition, when more than five chronic medications are self-administered, patients have difficulty managing their treatment regimens.

Use of over-the-counter (OTC) medications and herbal therapies also contribute to polypharmacy and may increase the risk of medication-related problems. Patients often do not tell their physicians that they take these medications. Further, some OTC and herbal therapies may interact with prescription medications and reduce their effectiveness. Similarly, abuse of alcohol or illicit substances may contribute to medication-related problems and cause memory impairment, jeopardizing adherence to important prescription medications. In addition, this kind of abuse may augment or nullify the metabolism of prescribed drugs by inducing or inhibiting gastrointestinal or hepatic enzymes.

Concern about polypharmacy should not deprive patients of needed medications. Although elders' excessive use of medications is well documented, the underuse of clinically indicated medications is also receiving attention (Avorn, 2004). Several studies have reported substantial levels of undertreatment of chronic conditions in the elderly (Simon & Gurwitz, 2003). Rates of undertreatment have been reported to be as high as 60% for management of some chronic conditions in the elderly, including osteoporosis, hypertension, and depression. Thus, it is critical when managing polypharmacy that health care providers optimize medication management, avoiding both underuse of beneficial medications and excessive and inappropriate use of drugs.

A goal of polypharmacy management is to prescribe indicated medications while not overwhelming the patient with unnecessary and inappropriate therapy (Williams, 2002). Prescribers should provide a clear rationale and therapeutic objective for each drug prescribed. Far too often, a medication is prescribed for long-term administration with little attention to achieving therapeutic goals and avoiding adverse drug events. When there are multiple prescribers, patients accumulate medications without appropriate follow-up and monitoring to ensure their safe and effective use. A key rule should be to carefully withdraw any medications that have no clear rationale, are not achieving the intended treatment goals, or that could be contributing to adverse drug events.

Effective management of polypharmacy requires appropriate communication between patients and providers. Providers must be aware of all drugs in a patient's regimen and how they are administered. Patients may be more open with a family member, nurse, or pharmacist about difficulties adhering to their medication regimen than they are with their physician. Also, subtle drug-induced problems can be vividly apparent to one health professional or close caregiver but missed by another. For example, the patient's spouse or a visiting nurse might readily notice subtle drug-associated cognitive impairment that could be missed by a primary care provider who sees the patient infrequently. Enhancing communication among health care professionals requires access to current, well-maintained records of all the drugs the patient is receiving.

Physicians must also be aware of all the medications that they and other providers have prescribed. Although cumbersome, it can be helpful to have patients bring all their medications with them to office visits and keep a written list of their medications. Advances in electronic medical records and widespread Internet access could eventually provide protected access to centralized drug records. In addition to prescription medications, physicians should ask their patients about use of OTC and herbal medications. Patients often self-medicate with other remedies without realizing the potential for harm or interaction with their prescription medications and medical conditions. This potpourri of treatments can put the patient at risk for adverse drug events, counteract important therapeutic goals, or confound the patient's self-management of the essential medications being prescribed.

Patients must be educated about all the drugs they receive. Medication instruction for patients is often haphazard and without assurances that they are receiving and understanding the important information about their medications. Ideally, patients should know the generic or brand names of their medications, the disease or problem each medication is intended to treat, how to take the medication, whether there are any important food or drug interactions, the desired responses or therapeutic goals of each medication, and the commonly encountered side effects. This information should be provided verbally and in written form, as well as individualized for each patient.

Patients with complicated medication regimens or cognitive impairment have difficulty remembering all the necessary information about their medications. Such patients may benefit from keeping a written list of all of their medications or having a caregiver organize and maintain a pill box for them. Similarly, patients may benefit from a medication card that contains the needed information with a picture of the pill or an actual pill affixed directly to the card. If patients or caregivers prepare such medication cards, they need to be reminded to modify the cards when the medication regimen changes.

Even when a pill box is filled by a caregiver or specially prepared medication cards are available, some patients are unable to self-administer their medications. Such patients may require caregiver support to administer medications or may require special reminder packaging of their medications to increase adherence. Special packaging techniques such as unit-of-use and compartmentalized containers can be very helpful, but they are labor-intensive and require commitment from the primary caregiver and pharmacist. Such medication-packaging programs may not be readily available to patients and, when they are, patients will likely have to pay out of pocket for the service. Reminder packaging represents a simple method that may improve adherence for certain individuals, although additional research is needed to determine the best design and most appropriate target for such a device.

Medication therapy management (MTM) has been recognized by the Centers for Medicare and Medicaid Services (CMS) as a strategy for optimizing therapeutic outcomes and preventing adverse drug events in older adults with polypharmacy (Bluml, 2005). Such services may enhance collaborations between prescribers and clinical pharmacists, which are needed to improve the quality of medication use for older adults (Gurwitz & Rochon, 2002). MTM services as outlined in the Medicare Modernization Act of 2003 (MMA, 2003) are offered to select beneficiaries who enroll in the Medicare prescription-drug benefit program. Eligible beneficiaries include those on multiple medications, with multiple chronic medical conditions, and likely to incur drug costs of more than $4,000 in 2006. Although it appears the initial design and implementation of MTM services will be limited in scope and reach only a fraction of older adults, CMS has stated that MTM services must evolve and become the cornerstone of the Medicare prescription-drug benefit program. Thus, it is critical that additional efforts seek to optimize the level and type of MTM service provided to optimize therapeutic outcomes in older adults (Murray & Callahan, 2003).

MARY T. ROTH
MICHAEL D. MURRAY

See also

Medication Adherence
Over-the-Counter Drugs and Self-Medication
Polypharmacy: Drug–Drug Interactions

Internet Resources

American Academy of Family Physicians: Polypharmacy
http://www.aafp.org/x28929.xml

Ask Me 3
http://www.askme3.org/index.asp

Merck Manual of Geriatrics
http://www.merck.com/mrkshared/mmg/sec1/ch6/ch6a.jsp

National Institutes of Health (NIH), Senior Health: Taking Medicines
http://nihseniorhealth.gov/takingmedicines/toc.html

UNC School of Medicine Program on Aging: Polypharmacy in Older Adults
http://www.med.unc.edu/aging/polypharmacy/

REFERENCES

Avorn, J. (2004). Polypharmacy: A new paradigm for quality drug therapy in the elderly? *Archives of Internal Medicine*, *164*, 1957–1959.

Bluml, B. (2005). Definition of medication therapy management: Development of profession-wide consensus. *Journal of the American Pharmacological Association*, *45*, 566–572.

Gurwitz, J. H., & Rochon, P. (2002). Improving the quality of medication use in elderly patients: A not-so-simple prescription. *Archives of Internal Medicine*, *162*(15), 1670–1672.

Murray, M. D., & Callahan, C. M. (2003). Improving medication use for older adults: An integrated research agenda. *Annals of Internal Medicine*, *139*, 425–429.

Simon, S. R., & Gurwitz, J. H. (2003). Drug therapy in the elderly: Improving quality and access. *Clinical Pharmacology Therapy*, *73*, 387–393.

Stewart, R. B., & Cooper, J. W. (1994). Polypharmacy in the aged: Practical solutions. *Drugs Aging*, *4*(6), 449–461.

Williams, C. M. (2002). Using medications appropriately in older adults. *American Family Physician*, *66*, 1917–1924.

POVERTY

Although the poverty rate has decreased over the last 3 decades, poverty is a major concern for the elderly. For purposes of determining the federal poverty level, income is defined as all cash payments received by an individual or family from earnings, government benefits, or any other source. For a family unit of one, the poverty threshold is $9,800; for a family of two, $13,200 (Federal Poverty Guidelines, 2006). This poverty line is adjusted upward each year as the cost of supporting a family rises. Longer life, higher costs for medical care, smaller and more distant families, and greater needs for daily living support constitute the poverty scenario for elders. Generally, elders prefer to maintain their dignity by hiding their financial needs rather than asking for help or burdening their caregivers. Even when elders agree to accept financial aid, they need to be guided through the intricacies of the application process. It is predicted that 51% of individuals between the ages of 25 and 71 in America will experience poverty and live below the poverty line for at least 1 year (Rank & Hirschl, 2001).

Certain groups of elders have higher levels of poverty. Age, gender, widowhood, race, and ethnicity impact financial status. The poverty rate of elderly women is nearly twice the level of elderly men. However, Social Security keeps many women out of poverty. Even though women's total Social Security contributions are 38% of total contributions, due to income levels and years of work, women receive 53% of total benefits (Center on Budget and Policy Priorities, 2005). The poverty rate of elderly African Americans and Hispanics is more than twice the level of elderly Whites in the United States (Census.org/HHES, 2006). A lifetime of low wages predisposes minority elderly to poverty. Elderly legal immigrants were severely affected by the passage of the 1996 Welfare Reform Act. Many are no longer eligible for safety-net programs such as supplemental security income (SSI), food stamps, and Medicaid. However, some states have adopted laws that maintain the previous coverage for legal immigrants (Yan, 1999).

Social Security and SSI are a safety net for older adults. Social Security provides at least 50% of the total income for at least 50% of elders in the United States. It is the major financial antipoverty program and successfully reduces the severity or impact of poverty among this group. For two-thirds of the elderly, Social Security provides the majority of their income. For one-third of elders, it provides nearly all of their income (Social Security Administration, OASDI Monthly Statistics, July 2005). With the introduction of SSI in the mid-1970s, the face of poverty changed. Elders who are not eligible for Social Security because of a limited work history may now access a minimum level of financial aid through SSI. In addition, SSI recipients receive state medical, prescription, and transportation services. However, even after receiving federal benefits, 14.7% of women and 8.2% of men remain impoverished. SSI, Social Security, and private pensions kept the elderly poverty rate in the United States at 11.9% in 1997 (Center on Budget and Policy Priorities, 2005). Elders can access a variety of services through local and regional service providers. Agencies use a computer program that includes a comprehensive listing of federal and state programs. When workers enter a client's financial, medical, and social needs, the program matches the person to appropriate resources and services.

The elderly are the most under represented group receiving food stamps (Elderly Nutrition Project, 2004; fnsusda.gov/OANE). Many elders do not know that they are eligible for the program, have difficulty completing the required paperwork, and do not understand how food stamps or food cards are used. The poverty among rural elders is higher than urban areas. In addition, isolation and lack of access to health services increases the problems faced by these individuals (www.apa.org/rural/ruralwomen.pdf.).

Financial safety-net programs have strict eligibility guidelines that leave many individuals ineligible for assistance. These are the near poor, or "tweeners"—those who, because they have some income and assets, are ineligible for many assistance programs. The near-poor income level is 25% above the poverty threshold. The proportion of elderly at this income level (19%) is higher than the percentage of poor in the general population (9%) (Food Research and Action Center, 1997, FRAC.org). Widowed middle-class women who lose spousal pensions when their husbands die also find themselves in this financial situation (Villa, Wallace, & Markides, 1997).

Several programs exist to help the near poor. Elders who are house rich and cash poor can apply for reverse-mortgage programs. These programs allow homeowners to receive monthly checks based on the equity in their home; more elders are relying on the value of their home to be their retirement plan. Banks are familiar with the rules and regulations. Medicare Part D prescription-drug plans were created for all Medicare eligible participants in 2006. However, drug benefits are available for low-income elders throughout the country. Some states also offer to pay Medicare premiums for near-poor elders. The Medicare assistance program pays all or part of the Medicare premium based on an elder's monthly income and total assets. The Medicare office can assist with the application and processing (Medicare and You, 2006). The Senior Community Service Employment Program (SCSEP) is a federal workforce initiative that offers job training to individuals age 55 or older who meet low-income guidelines. Supported by the U.S. Department of Labor, the SCSEP provides retraining, employment, and community-service opportunities for eligible elders. Salaries are subsidized for work performed in nonprofit agencies.

Securing a place to live is a challenge for many elders due to the declining availability of affordable housing and the loss of medical-subsidy programs for the poor and near poor. The U.S. Department of Housing and Urban Development Section 8 housing and voucher programs reduce the rate of poverty among the elderly (Shashaty, 2006). Although the number and types of housing subsidies and vouchers are decreasing, opportunities for public-housing units are still available. Eligibility requirements for services differ for each authority. The local, county, or state housing authority can be contacted for information. Homeless elders living on the street have difficulty accessing services; they avoid shelters for fear of being victimized by other residents. Homeless elders have untreated medical conditions, suffer more than other homeless persons, and need assistance in negotiating the eligibility processes to obtain services (National Coalition for the Homeless, 2006). Some states provide limited subsidies for assisted-living facilities for the poor and near poor. The state department of aging can be contacted for information and assistance regarding assisted-living initiatives.

Legal Counsel for the Elderly, an affiliate of the American Association of Retired Persons (www.aarp.org), offers legal aid for low-income elders regarding landlord–tenant problems, eligibility for benefits, pension disagreements, and employment discrimination. This service is available to nonmembers. The Department of Veterans Affairs offers medical, pharmaceutical, residential, and social supports for veterans and their families. The Gray Panthers (graypanthers.org), a social action group, and Senior Action in a Gay Environment (SAGE, sageusa.org) are also valuable resources.

ROSALIND KOPFSTEIN

See also

Access to Care
Homeless Elders
Meals On Wheels
Medicaid
Social Security

Internet Resources

Administration on Aging
http://www.aoa.dhhs.gov/

American Association of Retired Persons
http://www.aarp.org

Center for Advocacy for the Rights and Interests of the Elderly
http://www.carie.org/

Center on Budget and Policy Priorities
http://www.cbpp.org/

Gray Panthers
http://www.graypanthers.org

Senior Action in a Gay Environment
http://www.sageusa.org

REFERENCES

Center on Budget and Policy Priorities (2005). Social Security and poverty among the elderly: A national and state perspective. Washington, DC.

Federal Poverty Guidelines. (2006). Available at: http://aspe.hhs.gov/poverty/06poverty.shtml

Medicare & You: 2006. Centers for Medicare and Medicaid Services. Baltimore: Pub. #10050.

National Coalition for the Homeless (2006). Homelessness among elderly persons. NCH Fact Sheet #15. Washington, DC.

Rank, M. R., & Hirschl, T. A. (2001). Rags or riches? Estimating the probabilities of poverty and affluence across the adult American life span. *Social Science Quarterly*, *82*(4), 651–669.

Shashaty, A. (1999). Major Sec. 8 Housing losses force out elders nationwide. *Aging Today*, *1*.

Shashaty, A. (2006). Affordable Housing Finance. Available at http://www.housingfinance.com

Villa, V., Wallace, S., & Markides, K. (1997). Economic diversity and an aging population: The impact of public policy and economic trends. *Generations*, *21*(2), 13–18.

Yan, J. (1999). Petty welfare-reform limits burden elders. *Aging Today*, *1*.

PRESSURE ULCER PREVENTION AND TREATMENT

In the past decade, the evaluation, treatment, and prevention of pressure ulcers have changed dramatically. This evolution has taken place for several reasons:

- explosive growth in the number and type of wound-care products
- maturation of the field of pressure-ulcer and wound-care research
- examination of pressure-ulcer development as a quality indicator by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and regulatory guidance by the Centers for Medicare and Medicaid Services (CMS)

Despite these reasons, in 2003 there was a 63% increase in hospital stays during which pressure ulcers developed compared to 1992 AHRQ data (Russo & Elixhauser, 2006). The majority of patients (i.e., 72.3%) with pressure ulcers were 65 years or older.

Although pressure ulcers are not within the exclusive purview of geriatrics, their multifactorial origins and multidisciplinary treatment make them the quintessential geriatric syndrome. That wound-care research comes from nursing, physical therapy, geriatric medicine, nutrition, dermatology, and surgical literature reflects how intractable and how challenging pressure ulcers can be, especially without a coordinated team approach.

Pressure ulcers develop because of the amount of pressure, the duration of pressure, and something particular about the person—his or her “innate tissue tolerance" (Braden & Bergstrom, 1987). It is difficult to capture or measure those intrinsic factors; therefore, a variety of tools has been developed to assess an individual's risk for development of pressure ulcers. Currently, two risk assessment tools, the Braden and Norton scales, are widely used. These scales weigh slightly different factors: the Norton scale includes physical condition, mental condition, activity, mobility, and incontinence; the Braden scale uses sensory perception, moisture, activity, mobility, nutrition, and friction or shear. Low scores indicate that a person is at high risk for developing a pressure ulcer. Most institutions use these scales to target patients for early intervention through pressure redistribution, friction reduction, mobility measures, skin care with moisture control, and nutritional supplementation.

Prevention techniques may seem onerous at first but, in the long run, they are less costly, less time-consuming, and less emotionally draining than the lengthy process of treating a pressure ulcer. Both hospital staff and family caregivers must learn the correct techniques for positioning the patient, and health professionals should take the time to observe how the patient is being moved by asking the following questions:

- Is a drawsheet or other lifting device being used correctly to limit friction and shear when the patient is moved?
- Is the patient being repositioned frequently enough? Every 2 hours is the standard recommendation for most individuals in bed, but if Stage I ulcers are appearing, this schedule may be inadequate.
- Is the patient optimally placed to limit pressure on bony prominences? For example, when lying on the side, is the patient positioned on the buttocks rather than the hip? Are the heels elevated?
- Do caregivers recognize that ulcers can occur anywhere and in any position? Are they providing adequate pressure redistribution through a support surface cushion and repositioning every hour when the patient is out of bed in a chair or wheelchair? Caregivers may be meticulous in their attention to the patient's skin care needs when in bed but may leave the patient in a chair for hours at a time, under the false assumption that "bedsores" will not occur when the patient is sitting up.
- Is the patient capable of initiating any spontaneous movements? If so, caregivers and aides should encourage patients to reposition themselves every 15 minutes or whenever possible.

Pressure redistribution devices, such as overlays, air mattresses, and air or gel cushions, may be appropriate, depending on the setting and the patient's level of risk. For patients who are malnourished, a dietitian or other nutrition specialist can recommend the appropriate fluid and nutrient intake, determine the need for supplementation with vitamins or minerals, and assess adherence; families must work with the health care team to implement the dietary advice. Families and clinicians should determine how well the patient is eating; whether the patient is having difficulty eating because of poor dentition, constipation, dysphagia, dementia, or visual impairment; or whether other illnesses, such as depression, may be affecting the patient's desire for food. With some creativity, patients' nutritional status can improve without having to resort to tube feedings. One example is giving a patient a nutritional supplement rather than water to drink when taking medications (unless contraindicated by a food–drug interaction).

Although the National Pressure Ulcer Advisory Panel (NPUAP) plans to introduce a new staging system in 2007, it currently recommends the following staging criteria for pressure ulcers:

Stage I: An observable pressure-related alteration of intact skin as compared with the adjacent or opposite area on the body. Changes may include one or more of the following: skin temperature (warmth or coolness), tissue consistency (firm or boggy), and/or sensation (pain, itching). The ulcer appears as a defined area of persistent redness in lightly pigmented skin; in darker skin, the ulcer may appear with persistent red, blue, or purple hues.

Stage II: Partial-thickness skin loss involving epidermis and/or dermis.

Stage III: Full-thickness skin loss involving damage or necrosis of subcutaneous tissue that may extend down to but not through underlying fascia.

Stage IV: Full-thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures.

The concept of deep-tissue injury (DTI) and its role in staging ulcers is receiving increasing attention (Black & NPUAP, 2005; Doughty et al., 2006). As a result of the NPUAP 2006 consensus conference and data responses from a survey posted on the NPUAP Web site, the working definition of DTI is "a pressure-related injury to subcutaneous tissues under intact skin. Initially, these lesions have the appearance of a deep bruise, and they may herald the development of subsequent development of a stage III-IV pressure ulcer even with optimal treatment" (Black & NPUAP, 2005, p. 415). The NPUAP is now determining how to stage a DTI and whether to change the existing staging system.

Staging is a method of classifying the amount of tissue destroyed. Pressure ulcers can only progress to higher stages, not regress to lower ones. A healing ulcer does not change from a Stage III to a Stage II; it is always a Stage III wound. Tools specific to the healing process can be used to describe changes in size, exudate, and signs of tissue healing. Areas that have healed are always at higher risk for redevelopment of ulcers.

Pressure relief is essential to both prevention and treatment. The techniques and concerns are the same as those for prevention: Once an ulcer has occurred, it is important to avoid any pressure on the area if possible. The clinician should also determine whether family or staff reeducation about pressure relief is necessary (Tomaselli, 2005).

In addition to adequate turning and positioning, pressure-redistributing support surfaces are essential for the management of pressure ulcers. These include foam mattresses; special pads or mattresses of air, water, or gel; air flotation beds; and air fluidized beds. CMS divides these surfaces into three separate groups, and each has specific criteria for Medicare Part B reimbursement in the home setting (http://www.wocn.org/publications/facts/pdf/medicare_part_b.pdf). Costs can vary more than 10-fold. To determine the most reasonable support surface for a patient, clinicians should consider the location and stage of the ulcers, the effectiveness of pressure reduction, the weight of the mattress or bed, and the noise that motors can make. NPUAP is in the process of changing the terms and definitions about support surfaces to allow easier comparison of the characteristics of different surfaces (see www.npuap.org)

As in the case of pressure-ulcer prevention, adequate nutrition is a must for treatment. The clinician must consider the new ulcer when making recommendations about protein and caloric needs: How exudative is the wound, and how much protein loss is occurring? Is the wound of sufficient size to cause extra catabolic stress on the patient? Do antibiotics, pain medications, or limitations in positioning of the patient have any impact on the patient's ability to eat? Is there a need to supplement vitamins?

The key to wound care is the establishment and maintenance of a moist, pink, granulating wound bed. This necessitates removal of all nonvital tissue, including eschar (i.e., the brown or black dead tissue that can cover the wound), slough (i.e., the yellow or white, often fibrous material that clings to the wound bed), and devitalized connective tissue, which may appear dusky red or frankly necrotic. Debridement can be surgical/sharp, mechanical (i.e., using irrigation or wet-to-dry gauze dressing), autolytic (i.e., taking advantage of the body's own proteins by using synthetic dressings), enzymatic (i.e., using commercially prepared agents such as collagenase or papain urea) (Ayello & Cuddigan, 2004), or biological (i.e., using maggots).

The most common mistake that wound-care novices make is inappropriate wound assessment. Visual inspection alone is inadequate. Darkly pigmented skin can mask Stage I ulcers. Soft, brown eschar can also superficially resemble hyperpigmented, normal skin, but eschar feels devitalized, spongy, and cool, unlike healthy tissue. Palpation may be able to detect changes in skin temperature compared with the surrounding tissue. Palpation of Stages III and IV wounds also enables the clinician to determine the extent of undermining, lyse adhesions; probe for abscess pockets and tunneling; and feel for exposed bits of bone. The clinician should also assess the odor of the wound; foul-smelling exudate may be the first sign of abscess or necrosis (Hess, 2005). CMS has now defined *minimal* pressure-ulcer assessment documentation in long-term care as requiring all of the following: location and staging, size, exudate, pain, color and type of wound-bed tissue, and description of wound edges and surrounding skin.

An extensive description of the products available for wound care is available in the literature. Despite the wide variety of materials available, however, there are few studies comparing products, and some clinicians develop preferences based on familiarity with a limited number of products rather than research results.

Wounds heal most effectively when moist. To maintain the proper amount of moisture, wounds usually require some form of hydration. The most popular hydrating agents are wound hydrogels, which can be applied directly to shallow wounds or can be rubbed into moistened gauze that is then used to pack the wound. Simple gauze moistened with normal saline alone is cheap and effective, but it works best if changed several times a day and cannot be allowed to dry out; such labor-intensive regimens are rarely feasible unless the patient or family is willing and able to change dressings.

Hydrocolloid dressings work well for Stage I and II wounds, and they can often be left on the wound for many days. They can damage friable skin, especially if they must be removed daily because of exudate or soilage. The literature lacks a consensus on the use of hydrocolloid dressings in diabetic patients.

Highly exudative wounds require hydrophilic dressings, and many are now available. These include sodium chloride–impregnated gauze, foam dressings, alginates, and many of the composite dressings. These dressings can often be left on for several days, depending on the amount of exudate. Negative-pressure-therapy dressings are also very beneficial for wounds with large amounts of drainage. Antimicrobial dressings of silver or iodine are useful in infected wounds or those with a high bioburden.

A variety of tools are available to assess wound healing. One such tool is the Pressure Ulcer Scale for Healing (PUSH), launched by the NPUAP (http://www.npuap.org/pushins.html). It provides a scoring system for healing and cues the clinician to reassess the care plan if healing is not occurring appropriately. The clinician generates a score based on ulcer size, exudate, and tissue type and follows the score over time to determine whether the wound is healing appropriately (Berlowitz et al., 2005).

Good wound care requires frequent assessment, pressure relief, adequate nutrition, maintenance of cleanliness, and readiness to try a different wound-care product if the regimen is not working. Inadequate healing requires reassessment of all factors: Is there sufficient pressure relief? Is the wound truly clean, or is there still dead tissue or bacterial colonization? Is the patient receiving adequate nutrition? Is the wound being dressed properly?

Although most pressure ulcers heal with proper care, their cost, pain, and functional consequences make prevention paramount.

ELIZABETH A. AYELLO
EUGENIA L. SIEGLER

See also

Pressure Ulcer Risk Assessment

Internet Resources

American Academy of Wound Management
http://www.aawm.org/

American Professional Wound Care Association
http://www.apwca.org

National Pressure Ulcer Advisory Panel
http://www.npuap.org

Wound Care Communications Network
http://www.woundcarenet.com

Wound, Ostomy, and Continence Nurses Society
http://www.wocn.org

REFERENCES

Ayello, E. A., & Cuddigan, J. E. (2004). Debridement: Controlling the necrotic/cellular burden. *Advances in Skin and Wound Care*, *17*(2), 6–75.

Berlowitz, D. R., Ratliff, C., Cuddigan, J., Rodeheaver, G. T., & the National Pressure Ulcer Advisory Panel (2005). The PUSH tool: A survey to determine its perceived usefulness. *Advances in Skin and Wound Care*, *18*(9), 480–483.

Black, J. M., & National Pressure Ulcer Advisory Panel (2005). Moving toward consensus on deep-tissue injury and pressure-ulcer staging. *Advances in Skin and Wound Care*, *18*(8), 415, 416, 418–421.

Braden, B., & Bergstrom, N. (1987). A conceptual schema for the study of the etiology of pressure sores. *Rehabilitation Nursing*, *12*(1), 8–12.

Doughty, D., Ramundo, J., Bonham, P., Beitz, J., Erwin-Toth, P., Anderson, R., et al. (2006). Issues and challenges in staging of pressure ulcers. *Journal of Wound, Ostomy and Continence Nursing*, *33(2)*, 25–132.

Hess, C. T. (2005). The art of skin and wound care documentation. *Advances in Skin and Wound Care*, *18*(1), 43–53.

Russo, C. A., & Elixhauser, A. (2006). Hospitalizations related to pressure sores, 2003. Healthcare cost and Utilization Project (HCUP) Statistical Brief #3. Agency for Healthcare Research and Care. Rockville, MD. Available at http://www.hcup-us.ahrq.gov/reports/statbriefs/sb3.pdf

Tomaselli, N. L. (2005). Teaching the patient with a chronic wound. *Advances in Skin and Wound Care*, *18*(7), 379–387.

PRESSURE ULCER RISK ASSESSMENT

Pressure ulcers are a serious health problem in the elderly and occur in all health care settings. Healthy People 2010 created a national indicator related to pressure ulcers. Objective 16 is to reduce the proportion of nursing-home residents with a current diagnosis of pressure ulcers. The target is 8 diagnoses per 1,000 residents, reduced from the current prevalence of 16 per 1,000 nursing-home residents (http://www.healthypeople.gov/document/html/objectives/01-16.htm).

Braden Scale

One of the most widely used risk assessment tools for the early identification of persons at risk for pressure ulcers is the Braden scale (http://bradenscale.com). The scale consists of six factors associated with the development of pressure ulcers: mobility, activity, sensory perception, moisture, nutrition, and friction or shear. The scores for each of the six factors are added to obtain the total risk score. The original risk cutoff score for the general population was 16 but later revised to 18; scores of 18 or lower indicate high risk for developing a pressure ulcer.

The changes inherent in aging skin and the dark pigment in Black and Latino patients require that scores be adjusted for these patient populations. A cutoff score of 18 is used for older patients and for Black and Latino patients (Lyder et al., 1998). The total risk assessment score provides a limited picture. Clinicians must also address any subscore with a low score (CMS TAG F314) by providing appropriate measures to correct the problem area. The risk assessment score is an adjunct to nursing judgment about when to implement pressure-ulcer–prevention strategies.

Risk Assessment Frequency

Clinical practice guidelines of the former Agency for Health Care Policy and Research (http://www.ahrq.gov/clinic/cpgonline.htm) recommend pressure-ulcer risk assessment on admission to a facility and then periodically, based on the clinical setting and changes in the patient's condition. In acute care, reassessment should be done on most patients within 48 hours after admission or after 24 hours for intensive care unit patients. Reassessment should also be done when major changes occur in the patient's condition. In long-term care, reassessment should be done weekly for the first 4 weeks after admission and then minimum quarterly. In home care, reassessment should be done at every visit by the nurse, based on the patient's illness severity (Ayello & Braden, 2002; CMS Tag F 314).

Prevalence and Assessment of Stage I Pressure Ulcers

Several national surveys (Barczak, Barnett, Childs, & Bosley, 1997; Whittington & Briones, 2004) support the idea that the largest percentage of pressure ulcers is Stage I or II. Color, especially erythema, has been the "gold standard" used by clinicians to identify Stage I pressure ulcers. Patients with darkly pigmented skin have the lowest prevalence of Stage I pressure ulcers and a significantly higher prevalence of higher stage, full-thickness ulcers. Because intact, darkly pigmented skin does not change color (i.e., does not blanch) when pressure is applied over a bony prominence, reliance on the classic NPUAP definition of a Stage I pressure ulcer as "non-blanchable erythema of intact skin" might account for missed identification of early skin injuries in persons with darkly pigmented skin.

Rather than redness, the new indicator for assessing Stage I pressure ulcers in persons with darkly pigmented skin would be darkening of the client's skin tone from the usual skin color, which may present as blue, gray, or purple. Adequate light is essential when assessing clients with darkly pigmented skin. Natural or halogen light sources are better than fluorescent lights, which cast a bluish hue and can interfere with detection of Stage I pressure ulcers. Clinicians should avoid wearing tinted glasses that alter their ability to make color assessments.

Clinicians also need to include factors other than color, such as the temperature of the skin over bony prominences, to ascertain differences from the surrounding skin. Initially, an area of early skin injury feels warmer. As the capillaries collapse as a result of pressure and the tissue dies, the skin temperature cools. Because pressure ulcers occur most frequently on the sacrum and secondarily on the heels, clinicians should give particular attention to these areas.

Tissue consistency may also be an indicator of a Stage I pressure ulcer. Clinicians should palpate for a firm or boggy feel. The revised NPUAP 1998 Stage I definition also alerts clinicians to include sensation as an indicator. Sensation may present as pain or itching. Some researchers are investigating ultrasound as a way of detecting Stage I pressure ulcers.

As soon as a Stage I pressure ulcer is suspected, the patient should be positioned so that there is no pressure on the ulcer; in addition, an appropriate pressure-relieving device must be placed beneath the patient. Even when a patient is on a support surface, repositioning is essential. Pressure-ulcer prevention guidelines as recommended by the AHRQ (http://www.ahrq.gov/clinic/cpgonline.htm) and NPUAP should be implemented. Prompt cleansing of soiled skin with appropriate protection from the detrimental effects of incontinence also helps prevent skin injury.

The NPUAP is currently reviewing the existing definitions of pressure ulcers; the concept of deep-tissue injury (DTI) has posed a problem for clinicians in pressure-ulcer staging, identification, prevention, and treatment. This is an emerging area of practice with little in the literature, and the most current information on DTI can be obtained from the NPUAP Web site (www.npuap.org).

Nutritional Assessment

Malnutrition and nutritional deficiencies have been linked with pressure-ulcer formation. Guidelines recommend an abbreviated nutritional assessment at least every 3 months for patients at risk for malnutrition. Clinically significant malnutrition is serum albumin less than 3.5 g/dL, total lymphocyte count less than 1,800/mm^3, or more than 15% decrease in body weight. Clients should also be assessed for oral and cutaneous signs of vitamin and mineral deficiencies. For example, extreme transparency of the skin on the hands, cellophane or tissue-paper skin, and purplish blotches on lightly traumatized areas (due to capillary fragility and subepithelial hemorrhage) reflect vitamin C deficiency. Superficial flaking of the epidermis suggests a deficiency of essential fatty acids and, in nonpigmented skin, vitamin A deficiency. Dry, reddened skin around the nose and eyebrows is a sign of zinc deficiency. Adequate nutrition includes appropriate protein, calories, vitamins, minerals, and fluids and is important for clients at risk of developing pressure ulcers, as well as those for whom wound-healing is the goal (Ayello, Thomas, & Litchford, 1999).

The importance of accurate assessment of weight and heights cannot be overemphasized. Unintended weight loss of even 5% can affect a patient's ability to maintain skin or heal a pressure ulcer. A comprehensive plan of care must include assessment of the risk for developing pressure ulcers. The Braden scale (www.bradenscale.com) is an example of a valid and reliable instrument that should be used on admission and periodically thereafter, based on the particular clinical setting and a patient's condition. Indicators for early pressure-ulcer injury (Stage I) need to be modified for clients with darkly pigmented skin. Clinicians will benefit from further guidance from the NPUAP about the newly recognized concept of DTI (Ankrom et al., 2005; Black, 2005; Doughty et al., 2006). Nutritional assessment and intervention are also important parts of risk assessment and treatment of pressure ulcers.

ELIZABETH A. AYELLO

See also

Integumentary System
Pressure Ulcer Prevention and Treatment
Skin Issues: Bruises and Discoloration
Skin Tears

Internet Resources

American Academy of Wound Management
http://www.aawm.org

American Professional Wound Care Association
http://www.apwca.org

Braden Scale
http://bradenscale.com

Healthy People 2010
http://www.health.gov/healthypeople/

National Pressure Ulcer Advisory Panel
http://www.npuap.org

Wound, Ostomy, & Continence Nurses Society
http://www.wocn.org

REFERENCES

Ankrom, M., Bennett, R., Sprigle, S., Langemo, D., Black, J. M., Berlowitz, D. R., et al., & National Pressure Ulcer Advisory Panel (2005). Pressure-related deep-tissue injury under intact skin and the current pressure-ulcer staging systems. *Advances in Skin and Wound Care*, *18*(1). 35–42.

Ayello, E. A., & Braden, B. (2002). How and why to do pressure ulcer risk assessment. *Advances in Skin and Wound Care*, *15*(3),125–132.

Ayello, E.A, Thomas, D. R, & Litchford, M.A. (1999). Nutritional aspects of wound healing. *Home Health Nurse*, *17*(11), 719–729.

Barczak, C.A., Barnett, R. I., Childs, E. J., & Bosley, L. M. (1997). Fourth national pressure ulcer prevalence survey. *Advances in Wound Care*, *10*(4),18–26.

Black, J. M., National Pressure Ulcer Advisory Panel (2005). Moving toward consensus on deep tissue injury and pressure ulcer staging. *Advances in Skin and Wound Care*, *18(*8), 415, 416, 418–421.

Center for Medicare and Medicaid Services (CMS) Tag F 314. Pressure Ulcers Guidance for Surveyors in Long-term Care. Available at http://new.cms.hhs.gov/manuals/downloads/som107ap_pp_guidelines_ltcf.pdf

Doughty, D., Ramundo, J., Bonham, P., Beitz, J., Erwin-Toth, P., Anderson, R., et al. (2006). Issues and challenges in staging of pressure ulcers. *Journal of Wound, Ostom,y and Continence Nursing*, *33*(2), 125–132.

Lyder, C. H., Yu, C., Stevenson, D., Mangat, R., Empleo-Frazier, O., Emerling, J., et al. (1998). Validating the Braden scale for the prediction of pressure ulcer risk in Blacks and Latino/Hispanic elders: A pilot study. *Ostomy Wound Management*, *44*(3A Suppl.), 2S–49S; discussion 50S.

Whittington, K. T., & Briones, R. (2004). National prevalence and incidence study: 6-year sequential acute care data. *Advances in Skin and Wound Care*, *17*(9), 90–94.

PRIMARY CARE PRACTICE

Primary care for patients beyond their reproductive and working years is relatively new for organized medicine. The blossoming number of healthy, active elders living into their 80s, 90s, and occasionally 100s is a phenomenon of the late 20th century and one that is certain to increase in the next millennium (Ham, Sloan, & Warshaw, 2002). Although chronic diseases prevail in later life, treatment successes have allowed patients with a variety of disorders to reach old age. The quality of life in those later years becomes the overarching consideration for older patients, caregivers, providers, and health-policy planners. Optimal quality of life throughout the life span is the goal of primary care. With the increase in the older population, the primary care of older persons will occur mostly in traditional primary-care offices (i.e., family practice, general internal medicine). Patients in special situations (e.g., those with disabilities in three or more areas of basic function or in one area with behavioral disturbances) may benefit from transfer to a geriatric primary-care practice.

Quality of life for most patients is measured in terms of functional capacity: which daily tasks they can accomplish independently, with assistance, or not at all. Functional assessment is an integral part of all geriatric care, regardless of setting. Accurate functional assessment leads to treatment plans that are highly satisfying to patients and families.

Ideally, geriatric primary care remains forward-looking. For most patients, preservation of autonomy is crucial to quality of life. Functional assessment leads to identification and diagnosis of problems that can be treated successfully. Prevention of new illnesses can be attempted, and counseling and preparation can lead to successful outcomes in dealing with challenges associated with this stage of life.

Primary-Care Office Environment

In establishing a practice ideally suited to older adults, certain office environmental accommodations should be made:

- The office should be close to mass transit because the driving skills of older patients may be impaired.
- The office telephone should be answered by a receptionist. If electronic menus are unavoidable, the message should include no more than three options, and “stay on the line for help” should always be included as a choice for those with rotary phones or who are confused.
- Offices need to be wheelchair friendly.
- Special examination tables that are wider and height adjustable are optimal, allowing patients to transfer from chair to table without risk of falls. If expense precludes having these special tables in all exam rooms, at least one room should be equipped, and older patients should be seen in that room.
- Step stools with attached handrails make the ascent to and descent from the exam table safer for older patients.
- Office chairs should have arms and be of sufficient weight to withstand “pushing off” by patients as they rise.

Transitions of Care

Because the odds of an older patient having an acute event are high, practitioners should provide care or offer links to care at a variety of sites. Communication among providers is critically important for older patients (Naylor et al., 1999). Primary-care provider groups who have ceded the care of their inpatients to hospitalists should select hospitalists committed to the acute care needs of older patients. Acute medical events in older patients often require rehabilitation, either in a specialized facility or in a nursing home. A new concept in the United States is the outpatient day hospital for short-term outpatient rehabilitation (Osterweil, Brummel-Smith, & Beck, 2000). Firm links to a home-health-care agency for visiting nurses and at-home physical and occupational therapy are essential. If social-work services are not available in the primary care practice, social work assistance can usually be found in consultation with the following:

- local visiting-nurse agencies
- the network of county Area Agencies on Aging (AAAs; www.n4a.org)

- private case-management services: these often for-profit agencies provide private social-work case assessment and management to patients and families that can be especially useful for families trying to coordinate care for distant relatives (a good starting point for the search for such agencies would be through the listings of the local AAA)

The provision of house calls by the primary-care provider may be required. Similarly, the presence of a trusted primary-care provider may ease the pain of transition from home to nursing home for both patient and family.

The Primary-Care Visit

Older patients require longer visits than younger people because they have more active problems, take more medications, and frequently require conversation with a secondary informant (e.g., spouse, adult child, or caregiver). Most geriatric primary-care offices allocate 60 minutes for new patients and 20 to 30 minutes for return visits (Hu & Reuben, 2002). When visits of this length are impossible, various strategies can be used: A complete new patient assessment may be developed over several visits, or previsit questionnaires or telephone interviews may be used to collect a medical history. Some practices use "group visits" of patients with similar problems on a given half-day. Education and counseling are facilitated, and the group members can support one another.

Initial diagnosis and treatment plans for older patients are best developed during an interdisciplinary-team evaluation. Core professionals usually include physicians, nurses, and social workers, all with advanced training in geriatric care. Individual programs may include additional professionals as part of the assessment team: pharmacists, physical therapists, neurologists, or psychiatrists, for example. Assessments can be done over several visits or as one (often exhausting) day. Treatment objectives are based on functional assessment; are developed as a team; and are reviewed with patients, families, and referring practitioners.

Geriatric primary-care practices have obtained reimbursement from various sources for unbillable services, such as nursing evaluation and teaching, social-work assessment, and case management. Hospitals may provide support because patients provide referrals for inpatient care and specialty services. Some practices have generated endowment income, and others have grant support for innovative care or teaching.

The initial visit establishes the foundation for ongoing care. Patients must feel welcome, understood, and secure. Although attention to the office structure, staffing, and interdisciplinary links may facilitate these feelings, the initial encounter with the provider is the experience. Scheduling adequate time for the encounter allows the visit to be relaxed for both the patient and the provider. Certain areas deserve special emphasis:

- Information gathering may be more complicated in older patients; family or caregivers accompanying the patient may provide critical information. A previsit telephone call may prepare patient and family for this conversation.
- The social history helps to ascertain information about the living situation (i.e., apartment, house, stairs, bathroom and bedroom location), support systems (i.e., family, neighbors, agencies), and occupational history. In private, providers should ask questions about possible mistreatment or fear of family or caregivers.
- A functional assessment should always be done by self-report, family report, or direct observation.
- A complete medication review should be attempted. Patients should be instructed to bring all medications to the visit. Ideally, the patient should demonstrate an ability to open the bottles and recognize the purpose of the pills and dosing schedule.
- A dialogue about advance directives should begin at the initial visit. Patients should be encouraged to bring in existing documents so that they can be reviewed and kept on file. Patients without living wills and durable powers of attorney for health should be informed about them for discussion at

future visits. Patients should be encouraged to select surrogate decision makers and review their wishes with family members.

- The review of systems should pursue common syndromes seen in older patients: incontinence, memory loss, falls, immobility, vision and hearing loss, dentition changes, sleep disorders, and pain, for example. It may take several visits to perform a complete physical examination because of time constraints or patient fatigue. Attention to postural blood pressure changes, alterations in skin, and musculoskeletal and neurological exams is especially important.
- Patient instructions should be clear, succinct, and in writing.

Not all problems need to be addressed and solved during the initial visit; however, the patient should be reassured that all complaints will eventually receive attention. Written instructions for new medications or exercise may facilitate compliance.

The schedule of return visits should be frequent enough to complete initial evaluations, monitor chronic problems or new therapies, and reassure the patient or family. Education about illnesses or health promotion may be scheduled with a team member. Interdisciplinary meetings may be scheduled around return visits.

The diagnosis or treatment of illness in older patients often requires consultation with specialists. In an ideal situation, specialists are located on the same site as the primary-care office. Older patients may have difficulty obtaining transportation to another site or become confused with multi-site care. The identification of consulting specialists with a special interest in and expertise with older patients is critical to useful consultation.

Prevention of unnecessary disability is crucial. Preparation of the patient for the challenges of late life should be ongoing. Multiple medical problems should be managed to allow maximal function and independence throughout the life span.

Mary Ann Forciea

See also

Multidimensional Functional Assessment: Overview
Transitional Care

Internet Resources

American Geriatrics Society – Educational modules for providers and patients
http://www.americangeriatrics.org

Area Agencies on Aging
http://www.n4a.org

Institute on Aging, University of Pennsylvania
http://www.ageweb@mail.med.upenn.edu Ambulatory Geriatric Medicine

Medicare: Nursing Home Compare
http://medicare.gov/NHCompare

REFERENCES

Forciea, M. A., Schwab, E. P., Raziano, D. B., & Lavizzo-Mourey, R. (2004). *Geriatric Secrets*. Philadelphia: Hanley & Belfus.

Ham, R. J., Sloan, P. D., & Warshaw, G. A. (2002). *Primary Care Geriatrics*. St. Louis, MO: Mosby Company.

Hu, P., & Reuben, D. B. (2002). Effects of managed care on the length of time that elderly patients spend with physicians during ambulatory visits. *Medical Care*, *40*, 6–13.

Naylor, M. D., Brooten, D., Campbell, R., Jacobsen, B. S., Mezey, M. D., Pauley, M. V., et al. (1999). Comprehensive discharge planning and home follow-up of hospitalized elders. *Journal of the American Medical Association*, *281*, 613–620.

Osterweil, D., Brummel-Smith, K., & Beck, J. (2000). *Comprehensive Geriatric Assessment*. New York: McGraw-Hill.

PRISON-RESIDING ELDERS

What is considered “elderly” among inmates?

It is not easy to define “elderly” prison inmates because 45, 50, 55, and 60 years are used to denote the lower age boundary of "older offenders." It is thought that 50-year-old inmates are physically and emotionally more similar to community-residing 60-year-olds due to a harsher lifestyle and the wear and tear of prison life; however, there is no empirical evidence to support this claim. Uzoaba (1998) defined "older" offenders as those 50 to 64 years of age, whereas "elderly" offenders were considered those aged 65 or older.

As of May 2000, the Criminal Justice Institute reported there were 3,752 offenders aged 50 and older, representing 17% of the current federal offender population (i.e., approximately 22,000). They are divided between those who are incarcerated (n=1,653) and those who are released into the community on parole (n=2,099). Of these, 108 (0.5%) are women. It is interesting that whereas the number of females imprisoned in North America is significantly smaller than that of their male counterparts, the growth rate of incarcerated women during the last 2 decades has outpaced that of men. This increase can largely be attributed to stringent crime-control policies, particularly regarding drug-related offenses.

What health problems do older inmates possess?

On admission, prisoners often have serious health problems, including wounds from gunshots, stabbing, or attacks. They often require glasses and may need teeth as a result of neglect or grinding from years of methamphetamine addiction. They usually require vaccinations, and older inmates in particular may suffer from a range of chronic illnesses such as HIV, diabetes, and arthritis.

In 1988, a study was conducted to examine the emotional, social, and physical health characteristics of older men in Canadian medium-security prisons, interviewing 48 male inmates aged 45 to 87 (mean age 53.5) and 44 younger inmates (mean age 24.5) (Gallagher, 1988). Apart from more hearing and visual difficulties and fewer sports- or work-related injuries, the physical health of the older men did not differ significantly at that time from that of their younger counterparts. Although not statistically different, musculoskeletal illness, circulatory disorders, and urinary difficulties were reported more frequently by the older inmates.

A recent publication reported that the most prevalent disorders among inmates age 60 and older in four prison health surveys were arthritis, hypertension, venereal disease, and stomach ulcers. Chest pain, breathing problems, missing teeth, and difficulty walking were also common health complaints. Depression, anxiety, and psychiatric disorders have also been found to be much higher than in the general population (Aday, 2003).

The prevalence rates for most chronic conditions among female inmates are significantly higher than the general population. Because nearly two-thirds of older women in American prisons are of color, they report higher rates of disorders common among minorities including HIV, TB, hypertension, obesity, and diabetes (Reviere & Young, 2004).

What kind of health services are offered to older inmates?

As of 1997, according to the National Institute of Corrections, 23 of 50 Departments of Corrections (DOCs) indicated that they provided services for elderly inmate care (National Institute of Corrections, 1997). Of these 23, 15 states provide consolidated medical care at one or more main sites. The most common approaches used to provide specialized medical for elderly inmates include chronic clinics, preventive care, and increased frequency of physical examinations. Florida, Texas, and several other states use additional approaches, such as physical therapy, work opportunities, and special recreation to respond to the medical needs of elderly inmates. Currently, Maryland prisons conduct intake and annual screenings for those older than age 50; however, there was not a separate prison facility exclusively for elderly inmates. Despite the growth in the female-inmate population, it has been argued that federal and state policies and programs neglect the unique living environment, health care, and programming needs of aging female inmates.

What kind of health services use patterns do older inmates exhibit?

Inmates use health services more frequently than do persons who are not in prison. It was interesting that men aged 35 and older used the services less frequently than younger inmates, despite a higher incidence of reported illness. Health costs incurred by older offenders while incarcerated are estimated to be three times larger than the costs incurred by younger offenders.

According to a 1995 Inmate Survey, 40% of offenders aged 50 and older saw the doctor three or more times in the past 6 months, while only 28% of those under age 50 did so. The older inmates also reported slightly higher use of emergency medical attention (21% versus 17%) but were less likely to report sick days than those under age 50 (Price Waterhouse, 1996).

What are the cost implications of this aging prison population?

Health care is undoubtedly the most critical issue when discussing the aging prison population, for a variety of reasons. First, American prisoners are not eligible for Medicare and Medicaid benefits. Rather, they may be offered a more substandard type of health care. Second, other life issues tend to compound these prisoners' lives, including strained relationships with family and friends, adjustment to prison life, and dealing with age-related illnesses (Duckett, Fox, Harsha, & Vish, 2000). Annual costs for inmates older than 60 are estimated to be $70,000 in the United States (Anonymous, 2004).

What options are being tried to reduce cost and improve efficiency?

Several cost-control methods have been implemented by prisons throughout the United States, including hospice, telemedicine, privatization of medical care, inmate co-payments, and managed care (Duckett et al., 2000). A recent study by the National Institute of Justice (NIJ) found that using telemedicine saved three prisons more than $59,000 by avoiding the need to transfer prisoners to the medical center. Another $27,500 was saved when the use of telemedicine prevented about 35 trips to local specialists (Telemedicine, 1999). With Telemedicine, doctors can treat patients via telemedicine systems, which work over telephone lines and employ a camera, microphone, blood pressure cuff, and stethoscope. By the late 1990s, Texas, Oklahoma, Tennessee, Michigan, Massachusetts, and Virginia were using telemedicine to provide for their prison populations.

Many states are entering into privately managed care agreements to provide mandated health care for criminal offenders, including mental health services. The most common mental health illnesses are depression, senile dementia, and substance abuse (primarily alcohol abuse) (Duckett et al, 2000). If implemented correctly, managed-care systems can promote efficiency, reduce unnecessary costs by eliminating unneeded services, and promote preventive health care even in offender populations.

There are efforts underway to investigating whether one can safely move older prisoners serving life sentences from maximum security prisons to less secure facilities, including nursing homes for inmates confined to bed. In Maine, the DOC uses nursing-homes beds for very frail and medically compromised elderly inmates (National Institute of Corrections, 1997).

Another option prisons utilize to handle the aging prison population is "compassionate release," available in Maryland as well as 21 other state DOCs. This form of release offers medical parole for chronically and terminally ill inmates whose needs are better met in the community.

What are the unique challenges and dilemmas?

The goals of health care in prison may be in conflict with the goals of the penal institution. Nurses, for example, are attuned to the need for improving self-esteem and quality of life, whereas corrections officials are often more concerned with retribution and punishment for what are often harsh and unforgivable crimes. Finding a balance between these goals can be challenging.

Efforts to promote early release of older offenders are met with resistance from groups such as those representing victims of crime. They would argue that longer sentences for serious crimes are in order, not shortened sentences. Yet, it is well known that criminal behavior, particularly of a violent nature, lessens considerably in later life. Older inmates themselves often become institutionalized and, in fact, many who are eligible for parole fail to even apply for early release. Programs of peer support from outsiders and opportunities for gradual release should be explored to reduce the relocation shock that is common on sudden release from years of incarceration.

Housing is another issue that is being debated. Many jurisdictions are creating separate facilities to house the older inmates. At least 16 states, including Florida, have such facilities and are offering hospice care for dying inmates as part of their on-site programs. Many experts feel that older prisoners fear younger inmates and are victimized in mixed prison settings and therefore need the protection that age-segregated settings provide. However, other experts feel that their existence among the younger offenders provides a sense of balance and order for the institution. Research is needed to more clearly identify which models work best for what types of inmates.

Because their numbers are extremely small, the special needs of older women prisoners are often not well addressed. Advocates support special health care initiatives to address their unique needs as well as palliative and hospice car units for terminally ill inmates. Prison personnel may lack the necessary skills to provide such care and thus would benefit from additional training. The special dietary needs of older inmates, particularly those living with various chronic diseases, should also be addressed. Attending to aging inmates is an issue that will grow in importance in the years ahead. More care and planning are needed.

Elaine M. Gallagher

See also
Autonomy

Internet Resources

Florida State Department of Health
http://www.doh.state.fl.us/Cma/reports/agingreport.pdf#search=%22aging%20inmates%20prisoners%22

Haworth Press
http://www.haworthpress.com/store/ArticleAbstract.asp?sid=S8WLUEJ3AP1L9KE71F3GGADAKW307PV6&ID=36913

National Women's Studies Association
http://www.nwsa.org/communities/downloads/Aging%20&%20Prison%20Bibliography.doc

Prison Activist
http://www.prisonactivist.org/pipermail/prisonact-list/2003-July/007670.html

PubMed
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12557993&dopt=Abstract

REFERENCES

Anonymous (February 28, 2004). Elderly inmates swell prisons, driving up health care costs. *USA Today*.

Aday, R. (2003). *Aging prisoners: Crisis in American corrections*. Westport, CT: Praeger.

Duckett, N., Fox, T., Harsha, T., & Vish, J. (2000). The aging prison population. Maryland State Commission on Criminal Sentencing Policy. Available at http://www.msccsp.org/publications/aging.html

Gallagher, E. (1988). Emotional, social and physical health characteristics of older men in prison. Simon Fraser University: Unpublished doctoral dissertation.

National Institute of Corrections (1997). *Prison medical care: Special needs populations and cost control.* Washington, DC: U.S. Department of Justice.

Price Waterhouse (1996). *1995 National Inmate Survey: Final Report, Correctional Service of Canada*. Ottawa, Ontario, Canada SR-02.

Reviere, R., & Young, V. (2004). Aging behind bars: Health care for older female inmates. *Journal of Women and Aging*, *16*(1/2), 55–68.

Telemedicine cuts costs of health care for inmates study reports (1999, November). Minnesota Issue-Watch. Available at http://www.mnplan.state.mn.us/issues

Uzoaba, J.H.E. (1998). Managing older offenders: Where do we stand? Correctional Services of Canada. Available at http://www.csc-scc.gc.ca/text/rsrch/reports/r70/r70e_e.shtml

PROGRAM OF ALL-INCLUSIVE CARE FOR THE ELDERLY (PACE)

The Program of All-inclusive Care for the Elderly (PACE) values the idea that seniors with chronic care needs and their families are better served in the community whenever possible. PACE is a prepaid, capitated managed-care program that combines all primary, acute, and long-term-care services for the frail elderly. PACE serves individuals who are aged 55 or older (although participants' average age is about 82), certified by their state to need nursing-home care, able to live safely in the community at the time of enrollment, and live in a PACE service area. Enrollment is not affected by changes in health status and continues as long as enrollees' desire. Provided at all PACE sites is a comprehensive set of preventive, primary, acute, and long-term-care services, as well as end-of-life care, all specifically tailored to the needs of each participant. The program is designed to closely monitor participants for even subtle changes in needs, which if left unattended could lead to inappropriate, avoidable, and expensive use of institutional (i.e., hospital and nursing home) care that would have an adverse fiscal impact on the site (Centers for Medicare & Medicaid Services, 2005).

The interdisciplinary team is the center of PACE services, consisting of professional and paraprofessional staff. Each PACE team includes a primary care physician, nurse, social worker, physical therapist, occupational therapist, recreation therapist or activity coordinator, dietitian, PACE center supervisor, home-care liaison, health workers or aides, and drivers. The viewpoints of different disciplines are brought together, and information gained through interaction with the PACE participants over time and in different settings is shared through the interdisciplinary teams (Greenwood, 2001). This approach authorizes those involved and allows more information to be available at the critical points when decisions are being made. In everyday practice, smaller subsets of disciplines operate as proxies for this comprehensive team to accomplish the care-management and care-delivery process (Temkin-Greener, Gross, & Kunitz, 2004). To integrate care provision, the team assesses and periodically reassesses participants' needs; develops care plans encompassing all Medicare- and Medicaid- covered services, including institutional, home, community, and end-of-life-care; and directly delivers all or most services. Social and medical services are delivered primarily in PACE's adult day health centers; center-based services must include primary-care services, nutritional counseling, recreational therapy, and meals. Oversight of progress and delivery of care is facilitated by PACE's emphasis on day-center attendance, but congregate housing and in-home services have been developed and integrated into care planning and provision. Some sites have recently begun contracting with independent (i.e., nonstaff) community-based primary-care physicians to allow them to continue to follow their patients after enrolling in PACE. Under this arrangement, PACE provides the participant and his or her physician with all team services, including care coordination and nurse practitioners or physician assistants (Eng, 2005).

The financial underpinnings of PACE are complex, varied, and evolving. PACE programs represent a three-way partnership among providers, the state, and the federal government. The Centers for Medicare and Medicaid Services (CMS) pays the Medicare capitation and each state establishes and pays the Medicaid capitation. In return, the PACE programs assume complete financial responsibility to provide all needed services to enrollees (Larson, 2002). In the past, the Medicare capitation payment has simply been the average county-based per-capita expenditures for Medicare Parts A and B multiplied by a 2.39 frailty adjuster. The program received the same payment for every Medicare-eligible PACE participant (excluding End Stage Renal Disease participants) enrolled from the county regardless of their health status. However, since 2004, CMS has been phasing in a new payment methodology with the goal of paying PACE programs, and Medicare Advantage plans, rates specific to the demographic, diagnostic, and functional impairment characteristics of each enrollee. Under Medicaid, the monthly capitation is negotiated and annually contracted between the local PACE provider and the state. Generally, states base their payments on their reimbursements for a nursing-home–eligible population, including both nursing-home residents and community-based long-term-care recipients. In 2006, combined Medicare and Medicaid capitation payments averaged approximately $4,900 per participant per month. Typically, one-third of payment comes from Medicare and two-thirds from Medicaid. Medicare-eligible participants who are not eligible for Medicaid pay monthly premiums equal to the Medicaid capitation amount but no deductibles, co-insurance, or other type of Medicare or Medicaid cost-sharing applies. PACE providers assume full financial risk for participants' care without limits on amount, duration, or scope of services (Larson, 2002).

The PACE model of care can be traced to the early 1970s, when the Chinatown community of San Francisco saw the pressing need for long-term-care services for the families whose elders had immigrated to the United States. A nonprofit corporation, On Lok Senior Health Services, was formed to create a community-based system of care. By 1986, federal legislation extended the system and allowed 10 additional organizations to replicate On Lok's "one-stop" health-service delivery and funding model in other parts of the country. The Balanced Budget Act of 1997 established the PACE model as a permanently recognized provider type under both the Medicare and Medicaid programs (Larson, 2002).

Currently, there are 35 programs in 18 states that have been fully established. All PACE sites are run by nonprofit health-care providers, but by 2007 there will more than likely be two operational for-profit PACE sites operating under a federal demonstration program. The National PACE Association (NPA)—a nonprofit trade association that exists to advance the efforts of PACE—has been developing strategies to reach new populations in need of comprehensive health care. Since the model has successfully been adapted in many communities, interest has grown in adapting the model to serve older adults in rural areas. Passage of the Community Options for Rural Elders (CORE) legislation by Congress in early 2006 led to the creation of the Rural PACE Provider Grant Program. The grant program provides start-up funding and cost-outlier protection to PACE organizations serving rural areas. Other areas of growth that NPA is looking into are Tribal States, Veterans Affairs, new payers, and other individuals not yet covered under PACE (National Pace Association, 2006).

SHAWN BLOOM
JILLIAN LEITAO

See also

Assisted Living
Case Management
Naturally Occurring Retirement Communities (NORCs)
Nursing Homes

Internet Resources

Centers for Medicare & Medicaid Services
http://www.cms.hhs.gov/PACE/01_Overview.asp#TopOfPage>

National PACE Association
http://www.npaonline.org/website/article.asp?id=4

REFERENCES

Centers for Medicare & Medicaid Services (2005). Overview: Program of all inclusive care for the elderly. Available at http://www.cms.hhs.gov/PACE/01_Overview.asp#TopOfPage>

Eng, C. (2005). Community primary care physicians in PACE: On Lok experience. Presented at a NPA Teleconference Series.

Greenwood, R. (2001). The PACE Model: Center for Medicare Education Issue Brief, 2 (10). Available at http://www.futureofaging.org/PublicationFiles/V2N10.pdf

Larson, L. (2002). A better way to grow: The PACE model. *Trustee Magazine*. Available at http://www.seniorjournal.com/NEWS/Eldercare/2-08-08PACE.htm

National PACE Association (2006). Rural PACE. Available at http://www.npaonline.org/website/article.asp?id=774>

Temkin-Greener, H., Gross, D., & Kunitz, S. (2004). Measuring interdisciplinary team performance in a long-term-care setting. *Medical Care*, *42*(5), 472–481.

PROSTHETICS: LOWER EXTREMITY

See
Joint Replacement: Lower Extremity

PRURITUS (ITCHING)

Pruritus is the most common dermatologic complaint in persons older than 65 years of age (Ward, 2005). In evaluating an elderly patient with pruritus, it is important to determine the presence or absence of an associated rash as well as whether the itch is localized or generalized. Many common dermatologic diseases including urticaria (i.e., hives), psoriasis, atopic dermatitis, and seborrheic dermatitis may be associated with localized and/or generalized pruritus (Ward, 2005). Drug hypersensitivity and bullous pemphigoid are two skin conditions that may be more common in elderly populations and are often preceded or accompanied by pruritus. Scabies, caused by the mite *Sarcoptes scabiei,* may also cause intractable itching. In these patients, pruritic, red papules tend to be localized to the trunk, particularly the periumbilical region, in genital areas, or finger-web spaces. Scabies is a common cause of epidemic generalized pruritus in nursing homes (Greaves, 2003).

Xerosis (i.e., dry skin) is the most common cause of generalized pruritus without a rash in elderly people (Ward, 2005). The stratum corneum of aged skin has a reduced water-holding capacity due to lower lipid (notably sebum-derived triglycerides) and amino acid content. Xerosis may be exacerbated by frequent bathing, use of strong soaps and detergents, cold weather, low humidity, rough clothing, malnutrition, and the use of diuretics and/or cholesterol-lowering drugs.

Pruritus without a rash may be secondary to many other conditions including nostalgia paresthetica, neurodermatitis, and parasitic infestation. A multitude of systemic diseases such as renal failure, thyroid and hepatobiliary disease, anemia, and lymphoma/leukemia may also cause generalized pruritus. Idiopathic itching of the elderly, so called senile pruritus or Willan's itch, may be considered in patients in whom the presence of primary skin disease, xerosis, drug hypersensitivity, or underlying systemic illness has been excluded. The pathophysiology of senile pruritus is poorly understood but may be related to factors such as dermal neuropeptide levels, reduced stratum corneum barrier function, and altered sensory threshold for subepidermal unmyelinated nerves (Ward, 2005).

Treatment

Treatment of pruritus due to skin disease such as psoriasis or atopic dermatitis is directed at the underlying cause. Pruritus secondary to xerosis as well as many other skin conditions may be improved by frequent and liberal application of thick, bland emollients, particularly after bathing (Ward, 2005). The occlusive effect of emollients traps moisture in the skin (Strober, Washenik, & Shupack, 2003). Creams are less greasy and are therefore cosmetically more acceptable than ointments. Greasy medicaments may affect a person's adherence to treatment; patients should be encouraged to experiment with different emollients. Commonly used emollients include glycerin, mineral oil, white or yellow petrolatum, and lanolin and lanolin derivatives (Strober et al., 2003). Preparations containing menthol have a cooling effect, whereas camphor and phenol have a local anesthetic effect. Those containing urea may also help to alleviate itch and reduce xerosis.

Typically, topical steroids are used initially to treat inflammation in skin conditions such as atopic dermatitis, psoriasis, stasis dermatitis, and neurodermatitis. In periods of quiescence or remission, these may then be replaced with simple emollients.. Long-term use of topical steroids in clinically normal skin may result in adverse effects such as tachyphylaxis, atrophy, and striae formation. Thus, steroids are contraindicated for pruritus due to xerosis alone and are no more effective than emollients, which are safer and cheaper. Doxepin and capsaicin are additional topical antipruritic agents that may be tried, but they often have limited effectiveness (Hercogova, 2005).

Systemic antihistamines are beneficial in the management of skin conditions in which pruritus is histamine-mediated, such as urticaria, drug-hypersensitivity reactions, and possibly atopic dermatitis. Commonly used sedating antihistamines include hydroxyzine (Atarax) and diphenhydramine (Benadryl), but older patients are often unable to tolerate these medications. Newer nonsedating antihistamines such as fexofenadine (Allegra), desloratadine (Claritin), and cetirizine (Zyrtec), although more costly, are useful alternatives (O'Donoghue & Tharp, 2005). Cardiac and anticholinergic toxicities limit the usefulness of tricyclic antidepressants such as doxepin. Ultraviolet light has been successfully employed in a range of pruritic disorders including atopic dermatitis, psoriasis, neurodermatitis, as well as pruritus of renal disease and of HIV. Recently gabapentin (Neurontin) has been reported to be effective in the treatment of refractory generalized pruritus of unknown origin (Yesudian & Wilson, 2005). Acupuncture, hypnosis, and transcutaneous nerve stimulation are alternative treatments of unknown efficacy.

Scratching is a reflex function at the spinal-cord level. Although it may provide temporary relief, it can promote further itching. Clinicians must explain the itch-scratch cycle and promote efforts to break it, using strategies such as diversional therapy.

Prevention

A survey of noninstitutionalized elderly suggests that skin problems are common and skin care needs are largely unmet (Beauregard & Gilchrest, 1987). On examination, 85% of older persons were found to have xerosis. Typically, those studied had poor understanding of their skin problems and had sought virtually no professional assistance.

Education can help the patient understand how to reduce those factors that promote itching. Patients should be advised to avoid hot or prolonged showers, thus limiting evaporation from the skin. Excessive use of soap should be avoided because it dissolves sebum. Instructing patients to bathe with nonirritating soaps and to limit application only to apocrine gland-bearing areas may help alleviate symptoms. Patting the skin dry with a cotton towel and avoiding rubbing help maintain a natural protective barrier.

Patients with pruritus should limit the frequency of bathing. Partial baths or assisted bowl washes may be more suitable. Mobility and staffing problems in institutional settings may impose restrictions on bathing. Staff should exercise special caution when helping the elderly transfer out of the bath following the use of bath oils.

Allergic and irritant contact dermatitis may cause or exacerbate pruritus. Teaching can raise awareness of common allergens such as fragrance, formaldehyde-releasing preservatives, nickel, rubber (sometimes found in old underclothes), balsams (in many cosmetics), plant dyes, lanolin, and esters.

Environmental factors that may contribute to pruritus include humidity and temperature of living areas. Dry skin is common when humidity is less than 30%, thus maintaining a humid environment when bathing is helpful. Central heating or use of an electric blanket may have an excessive drying effect and lead to pruritus. Use of cool compresses or a spray water mister may be helpful, although the effectiveness of such measures is not clear and is likely to be short-acting at best. Cotton bed linen and clothing are helpful in achieving adequate skin ventilation and comfort.

Alexis Granite

Internet Resources

American Academy of Dermatology
http://www.aad.org

American Academy of Family Physicians
http://www.aafp.org

eMedicine Consumer Health
http://www.emedicine.com

REFERENCES

Beauregard, S., & Gilchrest, B. A. (1987). A survey of skin problems and skin care regimes in the elderly. *Archives of Dermatology*, *123*, 1638–1643.

Greaves, M. W. (2003). Pathophysiology and clinical aspects of pruritus. In I. M. Freedberg et al. (Eds.), *Fitzpatrick's dermatology in general medicine* (pp. 398–405). New York: McGraw-Hill.

Hercogova, J. (2005). Topical anti-itch therapy. *Dermatological Therapy*, *18*, 341–343.

O'Donoghue, M., & Tharp, M. D. (2005). Antihistamines and their role as antipruritics. *Dermatological Therapy*, *1*, 333–340.

Strober, B. E., Washenik, K., & Shupack, J. L. (2003). Principles of topical therapy. In I. M. Freedberg et al. (Eds.), *Fitzpatrick's dermatology in general medicine* (pp. 2319–2323). New York: McGraw-Hill.

Ward, J. R., & Bernhard, J. D. (2005). Willan's itch and other causes of pruritus in the elderly. *International Journal Dermatology*, *44*, 267–273.

Yesudian, P. D., & Wilson, N. J. E. (2005). Efficacy of gabapentin in the management of pruritus of unknown origin. *Archives of Dermatology*, *141*, 1507–1509.

PSYCHIATRIC DIAGNOSIS AND THE *DSM-IV-TR*

Diagnosable, syndromically defined mental disorders affect approximately one-third of older adults (Lyness et al., 1999). An additional significant number of seniors have subsyndromal presentations of symptoms that also result in disability and morbidity. Untreated depression and dementia in the geriatric population pose risk to the individual, with poor optimization of overall health and well-being, poor control of other co-morbid medical conditions, and increased disability and stress for patients, caregivers, and family. Untreated depression is associated with high risk for death by suicide and other diseases in later life.

Although mental illness in older adults is common and treatable, less than 3% of seniors seek specialty mental health care (Lebowitz et al., 1997). The majority of seniors with mental illness are treated by their primary-care physicians. Diagnosis of psychiatric conditions poses a challenge because symptom presentation in older adults can be different from younger cohorts. Co-morbid medical illnesses often confound the picture, making diagnosis and management of the mental health condition more difficult. Additionally, age-related biases on the part of the patient, family, and clinician—often attributing problematic psychiatric symptoms to the inevitable consequences of "getting old"—are barriers to timely diagnosis and intervention. Overall, geriatric mental illness too often remains underdiagnosed and undertreated.

DSM-IV-TR

The *Diagnostic and Statistical Manual of Mental Disorders (DSM)* is an assessment tool used by mental health and medical practitioners to make diagnoses, inform treatment planning, measure impacts, and predict outcomes. A multiaxial diagnostic approach views the individual as part of broader systems, taking into account family and other relationships, presence of medical co-morbidities, and previous levels of functioning. *Axis I* specifies mental disorders, *Axis II* personality disorders and mental retardation, *Axis III* medical illnesses and conditions, *Axis IV* severity of psychosocial stressors, and *Axis V* overall psychological, social, and occupational functioning (not due to physical impairment) through use of the Global Assessment of Functioning scale. The most recently published *DSM* is the fourth edition, Text Revision (American Psychiatric Association, 2000).

The approach to diagnosis of psychiatric disorders in an older adult can be challenging. Unlike other areas of medicine, where diagnoses often are defined based on etiology or pathogenesis of the disease, the etiology or pathogenesis of psychiatric illnesses often has yet to be determined. Many psychiatric disorders present with overlapping symptoms, while additional factors such as medical illnesses and environment may influence the clinical presentation of disease.

Psychiatric illnesses are categorized by syndromes (e.g., cognitive, psychotic, mood, anxiety, and somatoform). Several Axis I diagnoses share criteria common across syndromes; therefore, a strategic approach to diagnosis is needed. For example, the cognitive disorder delirium, although defined by the presence of cognitive (i.e., intellectual) deficits, often also manifests with depressive, psychotic, or anxiety symptoms; if these latter symptoms are present solely in the course of delirium, a separate diagnosis of a mood, psychotic, or anxiety disorder is *not* given.

The *DSM-IV-TR* provides a classification scheme to aid diagnosis based on defined sets of criteria. It has the advantage of producing reasonably high rates of inter-rater agreement, comparable to clinical diagnoses in other specialties. However, two important caveats must be considered: (1) the diagnostic criteria are guidelines that must be mediated by clinical judgment; the experienced clinician may assign a certain diagnosis even in the absence of clear evidence for sufficient symptoms to meet all the DSM criteria; and (2) each category of mental disorder is not a totally discrete entity that unequivocally differentiates it from other mental disorders or from no mental disorder at all. Each disorder may present with different combinations of symptoms that are influenced by personality, environment, presence of co-morbid conditions, and previous history.

The initial approach to using the *DSM-IV-TR* assumes that a thorough assessment has been completed, including a thorough history, mental status examination, relevant aspects of the physical examination, and any necessary laboratory investigations. Moreover, history may be obtained from the patient, from family or other informants, and from medical records or conversations with other treating clinicians. Each of the diagnostic criteria is composed of a set of symptoms or signs reaching defined thresholds of severity and duration associated with impairment or decline in occupational and social function. In the geriatric population, this attention to occupational and social function is a limitation of the *DSM-IV-TR* because these criteria may be more difficult to utilize given traditional expectations of retirement from work and evolving social roles associated with aging. Often, practitioners who work with older adults emphasize other aspects of function such as social interactions, hobbies, and functional ability to care for oneself independently.

A complete medical evaluation, including detailed medication history and review of systems, is paramount when working with older adults. The *DSM-IV-TR* separately designates secondary psychiatric disorders that are “due to general medical condition” (e.g., “depression due to hypothyroidism” or “personality change due to cerebrovascular accident”). Thus, making a diagnosis of primary (idiopathic) psychiatric disorders requires exclusion of psychiatric conditions directly related to medical conditions. The interplay between medical co-morbidities and primary psychiatric disorders is an area of interest and concern for many practitioners. As increased medical burden has been associated with depressive illness, depression itself has been associated with poorer outcomes for other medical conditions such as cardiovascular diseases.

The *DSM-IV-TR* also recognizes psychiatric disorders secondary to substance use as separately denoted conditions (e.g., “alcohol-induced depression” or “benzodiazepine-withdrawal-induced anxiety disorder”). Obtaining a careful substance-use history is essential to make an accurate diagnosis. Cognitive disorders almost always are attributable to the patient’s medical co-morbidities, medications, substance use, or a combination of these factors.

Disorders in Older Adults

Cognitive disorders are commonly associated with aging, affecting an increasing number of seniors; up to 8% of those older than 65 and 30% of those older than 85 have Alzheimer’s disease (Small et al., 1997). The *DSM-IV-TR* categorizes the cognitive disorders into deliriums, dementias (i.e., Alzheimer’s type, vascular, due to other medical conditions or substance-induced), amnestic disorders, and age-related cognitive decline. Clinically significant behavioral disturbance and early- versus late-onset qualifiers are utilized in diagnostic coding. The presence of other psychiatric conditions such as mood or psychotic disorders due to an underlying dementia also should be coded separately on Axis I.

The presence of psychosis in the absence of an underlying delirium or dementia suggests a primary psychotic disorder, although mood disorders can also present with psychotic features. The primary psychotic disorders (i.e., schizophrenia, delusional disorder, schizoaffective disorder) are not specific to the geriatric population, and potential differing presentations associated with late-onset schizophrenia (sometimes called paraphrenias) are not distinctly addressed in *DSM-IV-TR*. Symptoms can be shared across syndromes, with patients presenting with both mood and psychotic features. Determination of the initial presenting symptoms and overall pattern of symptoms over time can help to determine whether the diagnosis is a mood disorder with psychotic features, schizophrenia with depression, or schizoaffective disorder.

Mood disorders may affect up to 25% of older adults (Lebowitz et al., 1997). As with other conditions, depression can present differently in seniors compared with younger cohorts, with increased somatic symptoms and cognitive complaints and fewer subjective complaints of altered mood (e.g., sadness, anxiety) or ideational symptoms (e.g., worthlessness, guilt, suicidal ideation). Major depression, dysthymic disorder, and bipolar-spectrum disorders are well defined in the main text of the *DSM-IV-TR*, whereas minor depression and alternative research criteria for dysthymic disorder are found in the appendices. So-called subsyndromal depression can cause significant dysfunction and distress, with a cumulative morbidity greater than that of major depression because of the former's higher prevalence.

Anxiety symptoms are common in seniors and can be prominent in a variety of disorders. Primary anxiety disorders are diagnosed only after it has been confirmed that the anxiety is not solely part of a cognitive, psychotic, mood, or secondary (i.e., due to the effects of a substance or of a medical condition) disorder. Specific anxiety-disorder diagnoses include agoraphobia, panic disorder, specific phobia, social phobia, generalized anxiety disorder, posttraumatic stress disorder, and obsessive-compulsive disorder.

Other *DSM-IV-TR* diagnoses must be considered in older adults. Some of the most common include adjustment, personality, sleep, sexual, and somatoform disorders. Bereavement, although not considered a mental disorder, is listed in *DSM-IV-TR* as a condition that may require clinical attention, with symptoms that considerably overlap those of depression; indeed, bereavement stressors are powerful risks for the development of full-fledged mood disorders.

Categorization of mental disorders, despite limitations, is necessary and important for clinical, educational, and research purposes. The editions of the *DSM* have continued to integrate a greater understanding of these disorders, as well as the biopsychosocial factors that contribute to affect or modify their course. Although the *DSM-IV-TR* expanded the text of the previous *DSM-IV*, it did not revise the criteria. With the rapid growth of research, additions and modifications of criteria will be required in *DSM-V*, anticipated to be published no sooner than 2010. Factors for further discussion that pertain to the geriatric population include differentiating pathology from "normal aging," defining disorders utilizing a developmental perspective by looking at disorders over a lifetime such as age of onset, lifetime history, and longitudinal course (Widiger & Clark, 2000), and determining which disorders warrant distinct diagnostic criteria if they present, or present for the first time, in later life.

LISA L. BOYLE
JEFFREY M. LYNESS

See also

Cognition Instruments
Delirium
Dementia: Overview
Depression in Dementia

Internet Resources

American Association for Geriatric Psychiatry
http://www.aagpgpa.org

American Psychiatric Association
http://www.psych.org

American Psychological Association
http://www.apa.org

Expert Consensus Guidelines
http://www.psychguides.com

International Psychogeriatric Association
http://www.ipa-online.org

National Institute of Mental Health
http://www.nimh.nih.gov

REFERENCES

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition, Text Revision (*DSM-IV TR*). Washington, DC: American Psychiatric Association.

Lebowitz, B. D., Pearson, J. L., & Schneider L. S., et al. (1997). Diagnosis and treatment of depression in late life: Consensus statement update. *Journal of the American Medical Association*, 278, 1186–1190.

Lyness, J.M., Caine, E.D., King, D.A., Cox, C., & Yoediono, Z. (1999) Psychiatric disorders in older primary care patients. *Journal of General Internal Medicine*, 14, 249–254.

Small, G. W., Rabins, P. V., Barry, P. P., Buckholtz, N.S., DeKosky, S.T., Ferris, S.H., et al. (1997). Diagnosis and treatment of Alzheimer's disease and related disorders: Consensus statement of the American Association of Geriatric Psychiatry, the Alzheimer's Association, and the American Geriatrics Society. *Journal of the American Medical Association*, *278*, 363–371.

Widiger, T. A., & Clark, L. A. (2000). Toward *DSM-V* and the classification of psychopathology. *Psychological Bulletin*, *126*, 946–963.

PSYCHOLOGICAL/MENTAL STATUS ASSESSMENT

The format for mental status assessment of elderly clients does not differ significantly from that used with younger clients. The health professional takes a psychiatric history, including a history of the presenting complaint and the medical, psychiatric, personal, and family history. The mental status examination should include the usual areas of appearance and behavior, speech, mood and affect, form and content of thought, perception, sensorium and cognition, and insight and judgment. Nevertheless, some considerations specific to the elderly must be considered.

It is generally acknowledged that the elderly population is increasing dramatically in developed countries. This, coupled with the fact that the risk of occurrence or reoccurrence of mental illness increases with age, means that the ability to carry out a careful mental status assessment is an important skill for any health professional working with elderly clients.

Although it is true that the risk of mental illness increases with age, mental illness itself should not be seen as a natural and therefore inevitable consequence of the aging process. There is a tendency for health professionals to view a decline in cognitive functioning as natural in an elderly person and to see depression, due to the loss of functional abilities or other losses, as an expected response. Such beliefs may lead the professional to see what she or he expects to see. In such circumstances, the health professional may fail to appreciate the complex interplay of social, biological, and psychological factors involved in the aging process; misdiagnosis and inadequate treatment may follow. The almost inevitable outcome is a poorer quality of life for the elderly client.

It seems that the attitude of the health professional is the starting point of any psychological assessment of an elderly client. How health professionals comport themselves during the encounter with the client and the beliefs they bring to the assessment are as important as the questions asked of the client and the tests undertaken.

Psychological assessment requires an engagement with the client at a much deeper level than that of mere data collection. The psychological assessment is a therapeutic interaction whose goal is to understand the client more fully in order to meet the client's needs. Clients who feel alienated from the assessor or misunderstood are not reliable historians and will not be cooperative in the assessment process. Many authors have written on the process of mental health assessment, including questioning techniques and assessment tools (Othmer & Othmer, 2002). However, this disscussion deals with the health professional's ways of being with the patient that can inform the assessment process.

Psychological assessment should have as its base the notion of shared humanity. That is, we are all more similar than we are different. The client is seen first and foremost as a fellow human being in the world who can be understood by the clinician through what they have in common—their humanity. In this way, the clinician is less likely to treat the client as a data-filled object to be examined and categorized. Three elements are essential to "being with" the client in shared humanity: understanding, possibility, and care-full concern (Walsh, 1999). "Being with" is more than a physical proximity to the client; it also entails an emotional and psychological proximity.

Being with the client in understanding means taking the point of view that everyone can be understood at some level, even if they are confused, angry, or anxious. Behavior, including delusional and confused behavior, has meaning and can be interpreted. From this perspective, the clinician is more likely to explore issues and behaviors rather than to simply label them as being related to depression, dementia, or the aging process. It also means attending to the client. Understanding can be submerged through an overemphasis on the task-oriented, stepwise process of data collection. We can become intent on asking certain questions or doing certain tests and fail to pick up on the subtle, nonverbal clues in the client's manner or behavior.

As human beings, we are all imbued with possibility. The treatment options and paths open to elderly clients should be based on their uniqueness as human beings and their unique sociocultural circumstances. The possibilities open to a client should not be cut off on the basis of a diagnosis alone or some other apparently constraining factor. A recognition of possibility also safeguards the clinician from jumping to hasty conclusions and from making decisions based on a paucity of evidence or a proclivity to act on a preconceived notion or prejudice.

In being with the client in understanding and possibility, the clinician is exposing his or her care and concern for the client. This genuineness brings about an engagement that is more likely to yield fruitful results for both the client and the clinician.

The Four D's

An elderly person can experience the same mental health issues as a younger person in the community. Nevertheless, the complex interplay of biological, psychological, and physical factors may present the clinician with a confusing picture. This is especially true for what is sometimes called the four D's of psychiatric assessment in the elderly: depression, dementia, delirium, and delusions (Gallo, Bogner, Fulmer, & Paveza, 2006). Failure to differentiate among these can have serious consequences.

The incidence of depression rises with age. Unfortunately, this very treatable illness is often overlooked or misdiagnosed. Depression in the elderly may be a consequence of loss or physical illness or it may be endogenous. The presentation of depression in the elderly can be quite different from depression occurring in other populations. The client may present with numerous physical complaints for which a cause cannot be found (this may also be a feature of an individual suffering from a high degree of anxiety). Lack of energy and less interest in activities can sometimes be regarded as consequences of the aging process and hence dismissed, but they may be related to an underlying depression. The depressed client may present with a lack of appetite, weight loss, irritability, agitation, preoccupation with the past, and lack of engagement with family and friends. Paranoid ideation and suspiciousness may also be present. An elderly client presenting with such features should also be assessed for suicidal ideation and should undergo a complete physical examination because many physical illnesses have depressive symptoms as part of their presentation. Some of these disorders include myocardial infarction, Parkinson's disease, various cancers, thyroid disorders, and stroke.

Depression can also be mistaken for dementia. However, the two disorders can coexist. Depression has a rapid onset, usually weeks to months, whereas dementia usually has a gradual course and develops over a period of years. Feelings of sadness, worry, or guilt are present in the depressed person. Guilt is usually absent in dementia, although the client's mood may be labile. Sleep disturbance is more usual in depression—either insomnia (sometimes with early-morning waking) or excess sleeping. Impaired drawing abilities and object-naming abilities are usually absent in dementia. Cognition in a depressed person may seem impaired due to difficulty concentrating and apathy. The patient may reply to testing with many "I don't know" answers. In dementia, the cardinal sign is a disturbance of executive functioning (i.e., planning, organizing, sequencing, and abstracting). These functions are readily and quickly assessed using cognitive screening tools (Borson, Scanlan, Watanabe, Tu, & Lessig, 2005; Royall, Palmer, Chiodo, & Polk, 2004).

Delirium caused by an underlying organic disturbance typically has a rapid onset of hours to days and a fluctuating course and is characterized by a disturbed level of consciousness ranging from hyperalert to difficult to arouse. Level of consciousness is usually intact in both dementia and depression (Fick, Agostini, & Inouye, 2002).

Although content disturbance is a feature of all of these disorders, the presentation varies. In a patient suffering from delirium, thought content may be characterized as incoherent and confused. Delusions may be present. Thought content in a depressed elderly client may include negative thoughts and thoughts of death, as well as hypochondria and nihilistic delusions. A client with dementia may appear paranoid, disorganized, and delusional. Judgment is poor in all these disorders, but socially inappropriate behavior is more common in clients suffering from dementia (Gallo, Bogner, Fulmer, & Paveza, 2006).

Although the distinguishing features of the four D's may be helpful, it is paramount that a clinician undertaking a mental status assessment of an elderly client be sensitive to the client's perception of the situation and not ignore the fact that the client is a fellow human being and is situated in a unique sociocultural environment with a unique history as a person. Such a focus on the personhood of the individual ensures that the clinician undertakes an assessment that is sensitive, inquiring, and thoughtful and has the potential to bring about the best outcome.

EDITORIAL STAFF

See also

Cognition Instruments
Delirium
Dementia: Overview
Depression in Dementia
Depression Measurement Instruments
Mental Capacity Assessment
Neuropsychological Assessment
Psychiatric Diagnosis and the *DSM-IV-TR*

REFERENCES

Borson, S., Scanlan, J. M., Watanabe, J., Tu, S. P., & Lessig, M. (2005). Simplifying detection of cognitive impairment: Comparison of the Mini-Cog and Mini-Mental State Examination in a multiethnic sample. *Journal of the American Geriatrics Society*, *53*(5), 871–874.

Fick, D. M., Agostini, J. V., & Inouye, S. K. (2002). Delirium superimposed on dementia: A systematic review. *Journal of the American Geriatrics Society*, *50*, 1723–1732.

Gallo, J. J., Bogner, H. R., Fulmer, T., & Paveza, G. J. (Eds.) (2006). *Handbook of Geriatric Assessment* (4th. ed.). Boston: Jones and Bartlett.

Othmer, E., & Othmer, S. C. (2002). The clinical interview using the DSM IV. Washington, DC: American Publishing, Inc.

Royall, D. R., Palmer, R., Chiodo, L. K., & Polk, M. J. (2004). Declining executive control in normal aging predicts change in functional status: The Freedom House Study. *Journal of the American Geriatrics Society*, *52*(3), 346–352.

Walsh, K. (1999). Shared humanity and the psychiatric nurse–patient encounter. *Australian New Zealand Journal of Mental Health Nursing*, *8*(1), 2–8.

PSYCHOTIC DISORDERS AND MANIA

When treating individuals with psychotic disorders and mania, the practitioner's priority is to create an alliance with the patient and family or a helpful third party. Demonstrated reliability, availability, and respect for the patient's individuality can allow sufficient trust to sustain the diagnosis and treatment process. The practitioner need not agree with the delusions or acknowledge the presence of hallucinations but should accept the patient's psychotic perceptions as evidence of a need for assistance and refrain from directive, confrontational efforts to correct the patient's false beliefs. It is important to identify distressing issues with the patient and third party, form a consensus, and share plans to reduce the problem. Gaining the patient's permission to share the results of diagnostic procedures and treatment recommendations with other concerned parties sets the groundwork for future collaboration. Particularly when disturbances in judgment or impulse control are expected, initial networking with team members will be time well spent when crises arise. Family and other involved parties should understand that delusions that do not interfere with care or personal well-being and do not overtly distress others may be ignored. Family therapy should be directed at understanding strengths and how to shore up the caring relationship.

Schizophrenia

The premature mortality and lost personal productivity and autonomy make schizophrenia the most devastating mental illness of adult life. Elements of successful treatment are a comprehensive, individualized approach, including medication, family support and education, and aggressive case management. Although 90% of persons with schizophrenia receive antipsychotic medication, only 50% receive the recommended array of psychosocial and rehabilitative services. Failure to add an antidepressant for depressive episodes or to provide for psychosocial treatments is the most frequent inadequacy (Lehman & Sreinwachs, 1998).

Most cases of schizophrenia in males occur in the second and third decades of life. Among women, there is a significant second peak occurring in the menopausal years. Late- and early-onset schizophrenia are similar in several ways. Positive symptoms are more prominent in women, and impairments in visual and auditory processing are also common, as are a family history of psychosis and a personal history of adjustment problems in childhood (Jeste, 1997). Sensory impairments, particularly hearing difficulties that were thought to contribute to the onset of paranoia, may result from difficulty acquiring and accommodating to glasses and hearing aids (Rabins et al., 1996). The overall pattern of cognitive impairment is similar in early- and late-onset disease. Late-onset disease is more frequent in women, has fewer severe negative symptoms, and is mostly delusional and paranoid in character. Impairments in learning, abstraction, and cognitive flexibility are not as severe.

Schizoaffective Disorder

Schizoaffective disorder is an illness that has features of both schizophrenia and mood disorders (a bipolar type or a depressive type). On initial presentation, schizoaffective disorder is often mistaken for Bipolar Mania or a Major Depressive Disorder with psychotic features because both have a combination of mood and psychotic symptoms. It is important to remember that Schizoaffective Disorder consists predominantly of psychotic symptoms, and that there must be a period of 2 or more weeks of psychosis in the absence of mood symptoms to make the diagnosis. The depressive type may be more commonly seen in older adults.

Delusional Disorder

Delusions are false beliefs that seriously impair judgment and do not originate from cultural or religious norms. Pathological suspiciousness, jealousy, exaggerated self-regard, and erotic obsession are the most frequent manifestations. Most aspects of personality and cognitive performance remain intact. However, failure to pay bills or to attend to physical illness or disability, along with accusations against others for which there is no basis in fact, brings these people to the attention of social service agencies. In most instances, antipsychotic medication substantially restores the person's capacity to manage, but only one in four patients abandons the delusions and gains clear insight into the problem.

Mania

Late-onset mania is often misdiagnosed and is probably more common than reported. The presentation is more complex and less typical than classic bipolar illness. A careful history from family may uncover hypomanic episodes that did not seriously impair the individual but in retrospect are clear indicators of early-onset disease. The difficulties associated with contributing conditions, age-related vulnerability to medication side effects, and structural brain changes make treatment difficult. Late-onset mania is often secondary to or closely associated with other medical disorders, most commonly stroke, dementia, and hyperthyroidism. It can also be associated with medications, including antidepressants, steroids, estrogens, and other agents with known central nervous system properties (McDonald & Nemeroff, 1996).

Late-onset mania is more frequent among men. The manic episode often presents with confusion, disorientation, distractibility, and irritability rather than elevated, positive mood. The clinical interview may be characterized by irrelevant content delivered with an argumentative, intense, yet fluent quality. The presence of psychosis, sleep disturbance, and aggressiveness, particularly in a nursing-home setting, may suggest dementia or depressive disorder rather than mania. Because late-onset mania is frequently misdiagnosed, patients are often treated with antipsychotics, antidepressants, or benzodiazepines, which provide only partial relief.

Pharmacological Treatment of Mania

Seniors who have experienced good results with lithium should not be switched to an alternative; however, advanced age, absence of family history of bipolar disorder, and mania secondary to another medical condition, particularly stroke or dementia, all predict a poor response to lithium. Age-related renal impairment and drug–drug interactions place older adults at increased risk for lithium toxicity. Mood stabilizers (i.e., anticonvulsants) are preferred both for acute and maintenance treatment. A partial response to monotherapy with an anticonvulsant after 3 to 4 weeks would require the addition of an atypical antipsychotic or another mood stabilizer (Young et al., 2004). Valproic acid is increasingly a first choice for augmentation of antidepressant therapy in the treatment and prevention of mania. The risk of hepatic toxicity is low when a therapeutic blood level is achieved, but valproic acid inhibits hepatic enzymes that metabolize a variety of other medications. Studies suggest that lamotrigine is beneficial for resistant bipolar depression (Nierenberg et al., 2006), but there is no evidence of this drug's effectiveness for mania or psychosis in late life. Its low rate of drug interaction, protein binding, and lack of need to monitor therapeutic levels or liver toxicity make it an attractive choice.

Antipsychotics and Movement Disorders

The typical antipsychotics (most frequently haloperidol, perphenazine, and thioridazine) tend to induce movement disorders as the dose and duration of administration increase. Although movement disorders also emerge spontaneously with advanced age, they are rarely disabling unless they evolve into Parkinson's disease or drug-induced pseudo-Parkinsonism. Drug-induced movement disorders are a direct result of dopamine receptor D_2 blockade and have several manifestations. Akathisia is a jittery, restless feeling that may be difficult to distinguish from anxiety but worsens as the dose increases. Tardive dyskinesia follows longer-term treatment with typical antipsychotics. It may be irreversible even when the medication is stopped or an atypical is substituted. Compared to younger patients, older adults have a three- to five-fold increased risk of tardive dykinesia. Spasticity of the tongue and lips and writhing movements of the trunk may be observed and can be disfiguring or disabling. Drug-induced Parkinsonism (i.e., extra-pyramidal side effects) can be alleviated with anticholinergics, but these agents pose problems for older adults whose cholinergic tone is reduced by age or other medications with anticholinergic properties.

The atypical antipsychotics (i.e., olanzepine, risperidone, quetiapine, ziprasidone, and aripiprazole) exhibit less dopamine D_2 receptor antagonism and more serotonin 5-HT_2 receptor antagonism than do typical antipsychotics. They must be used with care because they can increase a patient's risk of metabolic syndrome, which includes weight gain, hyperlipidemia, and elevated blood glucose, and can also increase the risk for severe medical conditions, such as diabetes and heart disease (Lieberman, 2004). Thioridazine is less likely to provoke extra-pyramidal side effects and irreversible movement disorders, but it lowers blood pressure and impairs balance as the dose is increased. Movement disorders are frequently seen but are usually not disabling with low doses of haloperidol and perphenazine. Thus, if symptoms are well controlled and the movement disorder does not impair function or appearance, patients may prefer to continue typical antipsychotics.

Use of quetiapine or olanzepine avoids the worsening bradykinesia seen in Parkinson's disease with typical antipsychotics and with higher doses of risperidone. Clozapine, the first atypical antipsychotic medication, does not induce movement disorders. At doses given to young persons with schizophrenia, it is anticholinergic and induces agranulocytosis in as many as 2% of patients. However, at low doses given to older patients with levodopa-induced psychosis, it significantly reduces psychosis and tremor without impairing cognition (Cummings, 1999). Clozapine at low doses and with white blood cell count monitoring may be beneficial for a small but clearly defined set of older patients.

Some patients will not take oral medications but will accept a long-acting injectable antipsychotic (i.e., haloperidol decanoate, fluphenazine decanoate, or risperidone long-acting injectible). These antipsychotics are best used after hospitalization where symptoms were controlled with oral medication. Psychosis arising out of delirium and in combination with dangerous behavior (e.g., agitation, pulling out life supports) requires haloperidol, which remains the drug of choice due to its relative freedom from cardiovascular side effects.

Electroconvulsive Therapy for Mania or Psychosis

Electroconvulsive therapy (ECT) has a long history in the treatment of mania and psychotic depression and may be indicated for a severely disturbed older psychotic patient who is agitated or violent, or when medications are ineffective or intolerable. It may be useful in cases of psychotic depression, imminent suicidal risk, or morbid nutritional status. However, advanced age, concurrent antidepressants, and cardiovascular compromise increase the risk of adverse reactions. Twice-weekly treatments and unilateral lead placement can limit cognitive impairment caused by ECT.

YOLONDA R. COLEMON
GARY J. KENNEDY

See also

Psychiatric Diagnosis and the *DSM-IV-TR*

Internet Resources

National Alliance for the Mentally Ill
http://www.nami.org

Depression and Bipolar Support Alliance
http://www.DBSAlliance.org/

National Institutes of Mental Health
http://www.nimh.nih.gov/

REFERENCES

Cummings, J. L. (1999). Managing psychosis in patients with Parkinson's disease. *New England Journal of Medicine*, *340*, 801–803.

Jeste, D. V. (1997). Special issue on schizophrenia, antipsychotics and aging. *Schizophrenia Research*, *27*, 101–267.

Lehman, A. F., Sreinwachs, D. M., & Co-investigators of the PORT Project (1998). Translating research into practice: The schizophrenia patient outcomes research team (PORT) treatment recommendations. *Schizophrenia Bulletin*, *24*, 1–10.

Lieberman, J. A. (2004). Metabolic changes associated with antipsychotic use. *Primary Care Companion to the Journal of Clinical Psychiatry*, *6* (Suppl. 2), 8–13.

McDonald, W. M., & Nemeroff, C. B. (1996). The diagnosis and treatment of mania in the elderly. *Bulletin of the Menninger Clinic*, *60*, 174–196.

Nierenberg, A. A., Ostacher, M. J., Calabrese, J. R., Ketter, T.A. Marangell, L. B., Miklowitz, D. J., et al., and STEP-BD Investigators (2006). Treatment-resistant bipolar depression: A STEP-BD equipoise randomized effectiveness trial of antidepressant augmentation with lamotrigine, inositol, or risperidone. *American Journal of Psychiatry*; *163*(2), 210–216.

Rabins, P. V., Black, B., German, P., Roca, R., McGuire, M., Brant, L., & Cook J. (1996). The prevalence of psychiatric disorders in elderly residents of public housing. *Journals of Gerontology*, *51A*, M319–M324.

Young, R. C., Gyulai, L., Mulsant, B. H., Flint, A., Beyer, J. L., Shulman, K. I., et al. (2004). Pharmacotherapy of bipolar disorder in old age: Review and recommendations. *American Journal of the Geriatric Psychiatry*; *12*(4), 342–357.

PSYCHOTROPIC MEDICATIONS IN NURSING HOMES

The use of psychotropic medications in long-term-care facilities has been the subject of clinical concern, federal regulation, and ongoing controversy. Nursing homes provide care for a population with high rates of dementia, behavioral disturbances, depression, psychotic features, and those who suffer from chronic mental illness. Multiple studies have shown that the prevalence of dementia and other psychiatric problems among nursing-home residents is 80% or more (Sadavoy, Jarvik, Grossberg, & Meyers, 2004).

The history of nursing-home care in the United States includes concerns raised in the 1970s and 1980s regarding high rates of antipsychotic medications, sedatives, and other tranquilizers often prescribed without documentation of a psychiatric assessment or care plan. The Institute of Medicine also raised concerns that depression was seldom identified or treated in this vulnerable population. Other issues, including the widespread use of physical restraints, and questions of poor quality of nursing-home care led to Congressional hearings and an unprecedented law that made long-term-care facilities one of the most regulated areas of health care (Sadavoy et al., 2004).

The Nursing Home Reform Act, Subtitle C of the Omnibus Budget Reconciliation Act of 1987 (OBRA-87) (PL 100-203), included a provision stating that residents of nursing facilities must be "free from the use of physical and chemical restraints." The regulations and subsequent interpretive guidelines issued by the Center for Medicare and Medicaid Services (CMS, formerly known as the Health Care Financing Administration) were considered controversial by many due to their broad scope and were revised and finalized in 1990 (Ryan, Kidder, Daiello, & Tariot, 2002). Many updates have been made to these guidelines, which can be accessed on the CMS Web site, www.cms.hhs.gov/manuals.

A chemical restraint is defined as a psychotropic medication drug used without appropriate indications, monitoring of side effects, in excessive dose, or for an excessive duration. The prescribing of these drugs must be clinically indicated, necessary, and appropriate for the condition being treated. Specific indications, monitoring of specific side effects, and documentation of ongoing need are required by the OBRA-87 regulations.

Many aspects of the OBRA-87 regulations reflect basic geriatric medical and psychiatric principles. The requirements for assessment, diagnosis, and documentation of indications for and side effects of psychotropic medications have highlighted the need for and importance of psychiatric interventions in nursing homes. Long-term-care facilities and those who practice in these settings should recognize the basic intent of these regulations; that is, to ensure the clinically necessary and judicious use of psychotropic medications (Sadavoy et al., 2004).

The terms *antipsychotic* and *psychotropic* are often confused and used incorrectly as synonyms. Psychotropic medications are one broad category of drugs that have central nervous system effects including antipsychotic, antidepressant, anxiolytic, and sedative-hypnotic agents. Antipsychotic medications are one type of psychotropic drugs that are used to treat symptoms including hallucinations, delusions, and disruptive behavior (Pompei & Murphy, 2006). Antipsychotic medications are subject to the greatest degree of regulation under OBRA-87.

The interpretive guidelines related to antipsychotic medications issued by CMS stress that these particular agents must not be administered unless necessary to treat a specific condition. Conditions warranting antipsychotic medications are included in the guidelines: schizophrenia, schizoaffective disorder, delusional disorder, mania and depression with psychotic features, acute psychotic episode, brief reactive disorders, atypical psychosis, Tourette's disorder, Huntington's disease, and organic mental syndromes, including dementia with associated psychotic and/or agitated behaviors. These behaviors must be assessed, documented, persistent, present a danger, and result in resident distress or impairment in functional capacity. Facilities are also instructed that antipsychotic agents may not be used when certain disruptive behaviors are the only indications. These behaviors include wandering, poor self-care, restlessness, impaired memory, anxiety, depression, insomnia, unsociability, indifference, fidgeting, nervousness, lack of cooperation, and behaviors that do not represent a danger to the resident or others (CMS, 2006).

The use of psychotropic medications on an as-needed (PRN) basis is strongly discouraged. Physician reevaluation is required if PRN medications are ordered and used more than twice in a 7-day period. The clinician is encouraged to formulate a treatment plan that avoids PRN medication orders.

Dementia is associated with a high prevalence of psychiatric symptoms and behavioral disturbances. Agitation, the most commonly reported complication of dementia, refers to symptoms of disruptive behaviors, including inappropriate verbal outbursts, physical aggression, and impulsive or perseverative motor activity. Of patients with dementia, 90% have at least one behavioral symptom, and 60% have four or more problem behaviors (Pompei & Murphy, 2006). This spectrum of behavioral symptoms includes physical destructiveness, verbal disruption, intrusiveness, impulsivity, and resistance to caregivers. Insomnia and sleep-wake cycle disturbances may develop, and nighttime wandering may compromise the patient's safety. Disrobing and sexually inappropriate behaviors often occur.

The recognition and treatment of depression and depressive features in nursing-home residents remains a major challenge. Depression in a frail elderly nursing-home resident with dementia may present as agitated, disruptive behavior. A screening test such as the Geriatric Depression Scale or other screening instruments may help identify symptoms in older nursing-home residents (Pompei & Murphy, 2006). In patients with more advanced dementia, depression is often not even considered as a cause of behavioral disturbance. The clinician must maintain a high index of suspicion and consider depression in the differential diagnosis of all behavioral disturbances in the elderly. Other contributing factors include pain, hunger, thirst, sensory loss, overstimulation, environmental distractions, or generalized discomfort.

Facilities may implement a variety of therapies to care for residents with behavioral problems. Behavioral management is often the key to therapy, as well as an important adjunct to treatment when psychiatric medications are indicated. Environmental and milieu management is extremely important, particularly for behaviors such as wandering, restlessness, and pacing (Sadavoy et al., 2004). Therapeutic recreational modalities are vital to daily life and can help address issues such as loneliness, isolation, and boredom, which can lead to a variety of behavioral disturbances. Access to physical, occupational, and speech therapies; correction of sensory deficits; and promotion of independence are important aspects of any behavioral intervention (Pompei & Murphy, 2006).

The appropriate use of psychotropic medications in long-term-care facilities requires assessment and diagnosis, identification of target symptoms, attention to dosing, and monitoring (Ryan et al., 2002). Positive outcomes as well as negative side effects of the medication must be monitored and documented. Attempts at dose reduction must be made at least twice in 1 year for antipsychotic agents and every 4 months for benzodiazepine-type anxiolytic medications, unless the clinician documents a contraindication. Regular nursing documentation for all patients on psychotropic medications is recommended. The duration of therapy must be individualized as part of a care plan that includes alternatives and adjuncts to medication, including behavioral, environmental, and activity therapies. Each category of psychotropic medication is subject to maximum daily dose recommendations. Clinicians are prompted by the regulations to screen for sedation, orthostatic hypotension, extrapyramidal symptoms, and the development of involuntary movements (Hughs & Lapane, 2005).

The pharmacist is an important member of the interdisciplinary team when evaluating the psychotropic medication regimen and documentation. Federal guidelines call for a monthly drug regimen review by a pharmacist for every resident of a long-term-care facility. The pharmacist should review the documentation of medication efficacy, adverse reactions, and attempts at dose reduction and screen for any irregularities in drug therapy that may arise in the course of treatment.

The impact of the OBRA-87 regulations on the prescribing of psychotropic medications to nursing-home residents has been substantial. Following implementation of the guidelines in 1990, an overall decline in the rates of antipsychotic use was noted, from as high as 42% to 16% (Hughs & Lapane, 2005). An increase in use of other agents, such as antidepressants or anxiolytics, was found in some studies but not others. By 1997, after several new atypical antipsychotic agents were available, use of these medications again started to slowly increase (Sadavoy et al., 2004). There was also a significant increase in the number and type of randomized, double-blind, clinical trials of these atypical agents for the treatment of dementia-related psychosis in nursing homes and other settings. Although positive efficacy of atypical antipsychotic agents was noted, with a lower incidence of side effects such as drug-induced Parkinsonism and tardive dyskinesia, concerns were raised by both the drug manufacturer and later the U.S. Food and Drug Administration (FDA) regarding an increase in cerebrovascular events and overall mortality among patients with dementia.

In April 2003, the manufacturer of risperidone issued a warning to all physicians regarding an increase in cerebrovascular events among patients with dementia. Subjects in clinical trails of risperidone experienced a 2% increase in nonfatal cerebrovascular events compared to those treated with placebo. By the end of 2004, the FDA required the manufacturers of olanzapine, risperidone, and aripiprazole to add this warning to the package insert for the medications. Ziprasidone, quetiapine, and clozapine were not required to add this warning, due to the lack of a large enough sample size of patients with dementia who had experienced cerebrovascular events. Further studies and data analysis using large databases have found that all antipsychotics, both typical and atypical, as well as benzodiazepines were associated with an increased risk of cerebrovascular events, but the effect size is quite small (Gill et al., 2005). A prior history of stroke has been found to correlate with the greatest likelihood of a new cerebrovascular event (Finkel et al., 2005).

On April 11, 2005, an advisory was issued regarding the use of atypical antipsychotic agents for the treatment of dementia-related symptoms and an increase in the mortality rate based on an analysis of placebo-controlled studies. The FDA conducted a review of 17 placebo-controlled trials of risperidone, olanzapine, quetiapine, and aripiprazole in patients with dementia, reaching a conclusion that these agents were associated with a 1.6 to 1.7 increase in mortality rate compared with placebo-treated subjects. No placebo-controlled trials of ziprasidone or clozapine have been conducted, but most experts view this small but statistically significant increase in mortality to be a class effect. Recent reviews suggest that older, typical antipsychotic agents present at equal or greater risk (Liperoti et al., 2005). Concerns have also been identified regarding benzodiazepine use, particularly when combined with antipsychotic agents in patients with dementia.

Antipsychotic agents remain a beneficial and necessary treatment for nursing-home residents who suffer from psychotic symptoms or behavioral disturbances that pose a danger to the patient or others in the facility. The vital issue is to perform a thorough assessment of the symptoms, utilize the interdisciplinary team, provide behavioral interventions for every resident, and discuss the benefits and risks of the agents with the patient, family, or significant other.

MELINDA S. LANTZ

See also

Behavioral Symptoms in Patients With Dementia
Depression in Dementia
Elder Mistreatment: Overview
Nursing Homes
Restraints
Wandering

Internet Resources

Alzheimer's Association
www.alz.org

American Association for Geriatric Psychiatry
www.aagponline.org

Center for Medicare and Medicaid Services
www.cms.hhs.gov/manuals

Family Caregiver Alliance
www.caregiver.org

National Citizen's Coalition for Nursing Home Reform
www.nccnhr.org

REFERENCES

Finkel, S., Kozmac, C., Long, S., Greenspan, A., Mahmoud, R., Baser, O., et al. (2005). Risperidone treatment in elderly patients with dementia: Relative risk of cerebrovascular events versus other antipsychotics. *International Psychogeriatrics*, *17*(4), 617–629.

Gill, S. S., Rochon, P. A., Herman, N., Lee, N., Sykora, K., Gunraj, N., et al. (2005). Atypical antipsychotic drugs and risk of ischaemic stroke: A population-based retrospective cohort study. *British Medical Journal*, *330*, 445–456.

Hughs, C. M., & Lapane, K. L. (2005). Administrative initiatives for reducing inappropriate prescribing of psychotropic drugs in nursing homes: How successful have they been? *Drugs and Aging*, *22*(4), 339–351.

Liperoti, R., Gambassi, G., Lapane, K. L., Chiang, C., Pedrone, C., Mor, V., et al. (2005). Conventional and atypical antipsychotics and the risk of hospitalization for ventricular arrhythmias or cardiac arrest. *Archives of Internal Medicine*, *165*(6), 696–701.

Pompei, P., & Murphy, J. B. (Eds.) (2006). *Geriatrics review syllabus: A core curriculum in geriatric medicine* (6th. ed.). New York: American Geriatrics Society.

Ryan, J. M., Kidder, S. W., Daiello, L. A., & Tariot, P. N. (2002). Psychopharmacologic interventions in nursing homes: What do we know and where should we go? *Psychiatric Services*, *53*(11), 1407–1413.

Sadavoy, J., Jarvik, L. F., Grossberg, G. T., & Meyers, B. S. (Eds.) (2004). *Comprehensive textbook of geriatric psychiatry* (3rd. ed.), New York: W. W. Norton & Company, Inc.

Q

QUALITY-OF-LIFE ASSESSMENT

Improved quality of life is the primary goal for clients receiving long-term care. But despite best intentions, it can be easily obscured by ongoing pressures associated with scheduling of services and recordkeeping requirements in formal programs and lack of attention to details in less formal settings. With careful planning, strategies can advance a quality-of-life focus in care planning and documentation, clinical-case conferences, and administration of formal programs. This strategy can also be applied to less structured environments.

Introducing the Objective

The process begins by all stakeholders in a clinical engagement agreeing to advance a quality-of-life focus. Activities are aimed at increasing caregiver and client communication about quality of life through gathering information on the degree to which clients perceive their illness/disability affecting quality of life. This information is then used to tailor a care plan that best matches patterns of assisted functional activity to the patterns of client needs and preferences. Communicating with clients about how they want routine services delivered and providing opportunities for clients' choices in planning care can address other client needs. Expanding staff–client communication about quality of life can increase staff awareness of client-specific quality-of-life information.

Reviewing Current Practices

To determine how to integrate quality-of-life issues into care patterns in established programs, an outside consultant or internal committee should review patients' records to determine how to incorporate quality-of-life information. This review includes introducing information on quality of life into the setting, training staff to obtain information, and collaborating with staff to find ways to address quality-of-life issues in clinical practice. The staff's role is to endorse the goals of the partnership and to incorporate new and revised information-gathering techniques into their current practice.

Nurses and social workers are well suited for this process because, as professional advocates for the client, they are concerned about client preferences and are traditionally responsible for planning care and scheduling services. However, all members of the care team (e.g., director, administrator, therapists, nurses, social workers) must understand and support objectives and activities.

To demonstrate existing practices in incorporating information on clients' quality of life, charts should be reviewed for a record of client–staff interaction on quality-of-life topics. These topics include discussing the care plan with the client, the client's approval, personal care preferences, and the effect of health-related problems or services on quality of life. Quality of life can be recognized by explicit descriptions of the client's emotional comfort, physical comfort, levels of mobility and task performance, social activities and personal relationships, awareness of needs, perceptions of current health and expectations for future health, sense of freedom to make decisions and choices, and views on the treatment and services received.

In settings of informal care or by a paid person not associated with an agency, care consultants should review information and then invite the client and caregivers to share perceptions of the situation and needs, past experiences, and preferences for change.

Obtaining New Quality-of-Life Information

Several instruments can measure quality of life for clinical services. Quality-of-life status can be measured using systematic interview guides such as the Quality of Life 100 Point Scale (http://www.stroudsymposia.org/about/). This visual analog obtains information on 10 domains: emotional comfort, physical comfort, mobility, task performance, social relationships and activities, awareness, general health, future health, choices, and view of treatment and services. Clients place an "X" that indicates the degree to which his or her quality of life is negatively affected by illness or disability. Obtaining quality-of-life information from both clients and caregivers stimulates communication between all parties.

Instruments such as the Clinical Comprehensive Assessment and Referral Evaluation (CLIN-CARE) (http://www.stroudsymposia.org/about/) can serve as supplementary scales. CLIN-CARE measures activities of daily living, living conditions, depression, self-perceived health, chronic pain, effort tolerance, critical incidents, fears, stress, satisfaction with services, involvement in decisions, and positive qualities.

Needs and preferences can be measured using the Basic Activities of Daily Living (BADL). The Time-Activity Pattern Schedule (http://www.stroudsymposia.org/about/)—which matches a client's current patterns of assistance in the BADLs, including bathing, dressing, toileting, eating, and transferring—with patterns for these activities in the period just prior to their needing assistance. The BADL Needs and Preferences Interview addresses a client's level of satisfaction with the time patterns involved in BADL care assistance and time-related preferences, such as how long a BADL takes and how frequently it occurs. It also reports problems resulting from unmet needs.

The same process applies to situations in which informal caregivers or paid caregivers not associated with a program are involved. Care consultants can make assessments using these instruments with input from the client, his or her physician, and caregivers.

Observing Clinical-Case Conferences

Observing clinical-case conferences can determine how staff consider quality-of-life issues when assessing clients' needs, planning care, and evaluating interventions. The Clinical Case Conference Inventory lists quality-of-life topic areas and is accompanied by a glossary of terms. As staff members address cases, their comments can be rated, based on whether a designated topic was mentioned once (1), followed by a discussion (2), or results in a care plan (3).

Sections of the Clinical Case Conference Inventory address quality-of-life quantitative terms used in the QoL-100 scale. Needs and preferences are expressed through client satisfaction with the timing of BADL assistance and with the sequencing of two or more assisted BADLs. Preferences for change include when assistance is given; duration, frequency, and pace of an activity; sequence of steps involved; and caregiver attitudes. Other topics addressed include the care schedule and reasons for planned care not being received; awareness of contingency plans when assistance is unavailable; and use of services (e.g., delivered meals) that reduce the need for personal assistance. Recording the number and variety of quality-of-life references made by people attending case conferences and the resulting changes in care plans help observe the affect of a quality-of-life focus over time.

Sensitizing Caregivers

New training techniques can sensitize staff to connections between service deliveries, clients' views on their needs and preferences, and clients' self-perceived quality of life, that this is essential to ensure a change in clinical practice. For example, staff can see summaries, in graph form, of clients' perceptions of how health-related problems have adversely affected their quality of life in the 10 domains of the QoL-100. Before viewing, staff members mark on a QoL-100 schedule how they think the client reported his or her quality of life in each domain. Differences may represent a conflict in how staff and clients view the effect of health problems on quality of life and indicate a need for interventions to improve communication and to understand the meaning behind those differences.

Client and caregiver views of how illness and disability impact quality of life can be startlingly different. For example, a client may believe that a physical-therapy assistant who wants to do range-of-motion exercises is assaulting her, while the therapist feels that she is helping the client improve function. An explanation might solve the problem but the therapist believes that it is useless because of the client's short-term memory loss. When clients and caregivers expose these differences, improved understanding can result in more sensitive and appropriate care planning. Awareness of the constantly changing nature of disability and its affect on quality of life underscores the need for frequent reevaluations.

Reinforcing the Process

Once client charts have been reviewed, interventions with the staff members completed, case conferences observed and rated, and public-relations materials reviewed, staff should be instructed on how to advance a quality-of-life focus in charting practices, clinical case conferences, and outside agency communications. For each area, existing practice should be acknowledged, changes suggested, and the quality-of-life rationale stated. For example, if the intake forms lack a quality-of-life focus, a space could be created to document that the client understands and agrees to the care plan and schedule. This provides documentation and implies that the client's needs and preferences are considered.

Clinical-case conferences often follow a format of presenting clients and problems involved with care. In addition to the traditional approach, staff could use quality-of-life issues as a focus or theme. For example, the theme "freedom to make decisions about my life" could be discussed with respect to the following: How much control does the client have over his or her life? Have health-related problems affected his or her range of choices related to daily activities, treatments, and services scheduled? What is the importance of this freedom to the individual? How do clients respond to loss of freedom? What can be done to reaffirm clients feeling that they have *not* been excluded from choices about their lives?

In a conference, this approach forces discussion of the effects of health-related problems on quality of life from the clients' perspective. With improved quality of life as the goal, discussion could move more swiftly in the direction of solutions and would encourage greater participation by everyone in attendance.

Likewise in a nonprogram setting, such questions can be posed to clients and caregivers to encourage communication and care planning that is more clearly quality-of-life–driven.

VIRGINIA W. BARRETT
BARRY J. GURLAND

See also

Autonomy
Elder Mistreatment: Overview
Home-Health Care
Case Management
Pain Assessment Instruments
Patient–Provider Relationships

Internet Resource

Stroud Center for Study of Quality of Life: Columbia University Faculty of Medicine
http://www.stroudsymposia.org/about/

R

RECREATION

See
Creativity
Leisure Programs
Therapeutic Recreation Specialists and Recreation Therapists

REHABILITATION

Life expectancy has increased along with the total number of older adults coping with physical limitations. Physical limitations develop through the process of disablement. The World Health Organization (WHO) defines *disability* as organ-system impairment creating difficulty in self-care activities. *Handicap* is defined as a disability hindering participation in society. Handicap may also develop due to contextual factors like environmental barriers (e.g., stairs) or availability of social support (Jagger, Barberger-Gateau, & Robine, 2005). The disablement process and organ-system problems often contribute to one another. For example, blindness or muscle weakness may cause difficulty with self-care activities at the same time that difficulty with self-care activities are leading to organ-system problems like falls or pressure sores. Rehabilitation professionals work as a team evaluating and intervening to reduce the impact of disability and limit handicap.

Professional Disciplines

The rehabilitation team usually includes a variety of individuals with varied backgrounds and training (see Table R.1). A physiatrist is a physician who specializes in rehabilitation and usually coordinates the team or program. Occupational therapists, physical therapists, and speech-language pathologists are educated at the postgraduate level and certified or licensed to provide rehabilitation services. Other rehabilitation providers who may be instrumental in the patient's care include dietitians/nutritionists, kinesiotherapists (i.e., movement specialists), prosthetists, music therapists, psychologists, recreational therapists, and vocational rehabilitation specialists.

Programs

Rehabilitation teams work in many settings. Services can vary considerably from site to site by focus and frequency of treatment and by the specialists involved in the rehabilitation team. Reimbursement for services also varies by care setting. To achieve the greatest benefit, it is critical to select the setting that will best meet the individual patient's needs because patients vary considerably in both abilities and needs. For example, a patient recovering from joint replacement has different abilities, limitations, and goals than a patient recovering from stroke.

Rehabilitation is often initiated in an acute-care hospital but is usually focused on assessment and discharge planning. Most restorative rehabilitation occurs after discharge in either rehabilitation hospitals or subacute-care settings (including some nursing-home facilities).

Rehabilitation can also occur in the patient's home. Although this permits the therapist to address functional limitations in the patient's own environment, the frequency and intensity of therapy provided in the home is often limited when compared to rehabilitation in inpatient settings. Medicare covers a limited number of home visits after an acute hospital stay; reimbursement by other insurers varies.

Rehabilitation may also occur in outpatient facilities. In some states, patients can self-refer for outpatient therapy, but most insurance, including Medicare, requires a physician referral to authorize payment. Medicare limits the number and

TABLE R.1 Rehabilitation Providers and the Methods They Typically Use in Evaluation and Treatment

Discipline	Methods for Evaluation and Treatment
Physical therapist	Assess joint range of motion and muscle strength Assess gait and mobility Exercise to increase range of motion, strength, endurance, balance, coordination and gait Treatment with physical modalities (heat, cold, ultrasound, massage, electrical stimulation)
Occupational therapist	Evaluate self-care skills and other ADL Home safety evaluation Self-care skills training; recommendations and training in use of assistive technology Fabrication of splints and treatment of upper-extremity problems
Speech therapist	Assess and treat communication disorders Assess swallowing disorders and recommend alterations to diet and positioning to treat these
Nurse	Evaluate self-care skills Evaluate family and home care factors Self-care training Patient and family education
Prosthetist	Assess need and fit for prosthetic devices Provide training to maximize function and safety
Physiatrist	Physician specialist in rehabilitation medicine Assess and prescribe rehabilitation interventions Coordinate a rehabilitation team Perform special tests such as EMG Perform special procedures such as joint aspirations/injections or nerve blocks
Social worker	Evaluate family and home care factors Assess psychosocial factors Counseling
Dietician	Assess nutritional status Alter diet to maximize nutrition
Recreation therapist	Assess leisure skills and interests Involve patients in recreational activities to maintain social roles

availability of outpatient rehabilitation visits. Primary physicians may also refer their patients to licensed rehabilitation professionals for fitness programs. This allows a program to be designed with individual needs considered. Insurance reimbursement for fitness programs depends on the patient's diagnoses, physical abilities, and goals. For example, Medicare often pays for fitness programs that are part of cardiac or pulmonary rehabilitation or that treat deconditioning that occurred in an acute illness.

Rehabilitation for older adults is covered by four primary payers: Medicare (Part A and Part B supplemental), Medicaid, the Department of Veterans Affairs, and private insurers. Due to variability in reimbursement rules, it is important to understand how therapy services will be covered before starting therapy. Those professionals arranging rehabilitation services should clarify this information for patients and their families.

Treatment prescribed by a physician and supervised by a licensed rehabilitation specialist is usually covered. For reimbursement to continue, however, patients must show progress toward a measurable goal. When function has been restored to a maximal level and/or the patient and family or caregivers have safely mastered new skills, discharge plans will be made. These plans often include recommending independent work by the patient and/or caregivers to maintain the gains achieved.

TABLE R.2 Factors That May Affect Rehabilitation Interventions, Prognosis, or Goals

Factor	Potential Effect
Cognitive impairment	Goals may be more limited. Take advantage of skills the patient already has; use interventions that don't require carryover.
Disability has been present for many years	Goals may be more limited and directed to compensatory strategies or treatment of deconditioning.
Motivation is limited (e.g., depression)	Goals need to be well defined and reached in measurable steps.
Patient had prior rehabilitation for the same problem	Rehabilitation may be limited unless new functional decline has occurred.
Terminal illness	Intervention is directed toward reducing pain and caregiver burden.
Severity of disability	Extremely mild disability may not require intervention. Extremely severe disability may have limited potential for benefit.
Cultural circumstances	Absence of a caregiver, financial limitations, cultural beliefs may preclude use of certain techniques or technologies.
Malnutrition	Building muscle requires both nutrition and exercise; rehabilitative interventions may have limited impact.
Delirium or altered level of consciousness	Unable to learn or cooperate; rehabilitation may need to be delayed until resolved.
Hemodynamic instability (e.g., congestive heart failure or severe infection)	May make it unsafe to carry out certain types of exercise.
Acute orthopedic conditions such as fracture, bony metastasis from cancer, or joint instability (structural instability)	Weight-bearing exercise could worsen fracture or cause fracture; rehabilitation interventions may be limited. Joint instability may preclude use of certain exercises, and functional goals may be limited.
Acute infection (e.g., bladder infection, pneumonia)	May cause confusion, fatigue, or low blood pressure; rehabilitation may not be appropriate until problem resolved.
Acute skin or joint infection	May cause fatigue, pain, or muscle splinting; rehabilitation may not be appropriate until resolved.
Acute inflammatory disease (e.g., certain rheumatological and neuromuscular conditions)	Resistive exercise may impair recovery; rehabilitative interventions may be limited.
Medications that may affect rehabilitation treatment: psychotropics, beta-blockers, those with Parkinsonian side effects, antihypertensives, anticoagulants	May alter ability to cooperate during rehabilitation or to carry out certain types of exercise or reduce the effectiveness of treatment. Rehabilitation may not be appropriate until problem resolved.

Modified from Hoenig, H., Nusbaum, N., & Brummel-Smith, K. (1997).

To this end, community-based programs are often available specifically for seniors. Found through local senior centers and commercial gymnasiums, these often offer a variety of structured exercise. Cost may vary, from free of charge to requiring membership in an organization plus additional fees. Recreational therapists often facilitate these programs whereas occupational therapists, physical therapists, and physicians are more likely to only play a consultative role.

Interventions

Rehabilitation interventions address both the individual and the environment while considering coexisting organ-system disease (see Table R.2). Interventions can include but are not limited to exercise, adaptive techniques, assistive technology, physical modalities, orthoses, and prostheses. Restoration can be classified as full, modified-independent, or assisted function.

Exercise helps to prevent or eliminate physical limitation. Even in the presence of other disease or illness, exercise reduces the extent of disability and counteracts the adverse effects of immobility. Older adults in particular may benefit from an evaluation by a rehabilitation team when initiating an exercise program. Having an individualized program that considers all medical and physical conditions helps assure success. A prescription for exercise obtained from a health care provider has been shown to be a powerful motivator for exercise participation.

Exercise has multiple types and purposes. Strength and flexibility training may reduce joint pain in arthritis. Weight-bearing exercise may improve bone density. Posture and balance may be improved through yoga or tai chi. Cardiovascular or pulmonary conditioning is addressed through aerobic exercise or endurance training. Task-based strength-training with nutritional support may help restore lean body mass (muscle) and can be especially helpful for frail older adults (Espinoza & Walston, 2005). Physical exercise has even been shown to reduce the likelihood of memory and cognitive decline and depression (Hogan, 2005).

Performing self-care tasks safely and independently can involve learning adaptive techniques. For example, therapists may train an individual with hemiplegia due to a stroke to dress independently using only one arm. Adaptive techniques may involve assistive technologies—devices designed to support safe activity. Assistive technologies have expanded rapidly in recent years with many new devices and designs. Although devices may be costly initially, they often decrease long-term costs by increasing the individual's ability to maintain independence, decreasing the need for costly personal assistance. Devices may be simple like raised toilet seats or canes or may be complicated like modifications to the home (e.g., patient lifts, grab bars, or hand rails). A physician's prescription is usually necessary for insurance reimbursement. Not all types of assistive technologies or their installations are covered by insurance. Rehabilitation specialists can recommend the appropriate devices, assist with equipment design and purchase, and provide fitting and training for patients and caregivers with new equipment. Improper equipment (by type or fit) is unlikely to maximize function and may even be dangerous (Bateni & Maki, 2005).

Physical modalities use techniques that promote healing by reducing local inflammation, muscle spasm, or pain. Ultrasound, diathermy, transcutaneous electronic nerve stimulation (TENS), whirlpool, massage, and the application of heat or cold are a few examples. Efficacy for many of these physical modalities is unproved, but anecdotes often support their use in individual situations. Consultation with a rehabilitation specialist is necessary for prescriptions and training in the safe use of the more complicated modalities (e.g., ultrasound, diathermy, and TENS).

Orthoses are supports to limbs, joints, and muscles (e.g., braces and splints). Prostheses replace missing limbs. Both can be critical elements in restoring function. Physicians and rehabilitation therapists assess need and prescribe these devices. Therapists also perform training monitor equipment fit, especially with prostheses. They can also be powerful advocates for patients if insurance coverage is questionable.

Rehabilitation Candidates

A variety of older adults may benefit from rehabilitation evaluation and treatment. Older adults with preexisting limitations in functional ability, those with a change in functional ability due to acute disease or injury, and those at increased risk for functional loss or injury may also be good candidates. Rehabilitation evaluation can be of great benefit when guidance is needed to identify and eliminate the physical or environmental factors that may magnify or create limitations. Evaluation can also identify patients who are medically unstable (e.g., due to congestive heart failure, chronic pulmonary disease, or severe infection) and may not be appropriate candidates for rehabilitation services. Appropriateness for rehabilitation interventions, particularly when the prognosis for recovery is favorable, should be reassessed frequently. The detrimental effects of immobility are much easier to prevent than to reverse.

Significant improvements in health in the elderly are quite evident through increasing life expectancy. Although risk of disease may increase, disease is not normal aging. Older patients may benefit from many rehabilitation modifications and interventions that prevent or reverse physical limitations. The WHO refers to "active aging." There is no doubt that remaining active physically, socially, and mentally promotes successful aging. Ongoing rehabilitation evaluation and treatment can be a helpful adjunct to achieving this goal.

William C. Logan, Jr.
Janet Robinson
Helen M. Hoenig

See also

Activities of Daily Living
Assistive Technology
Deconditioning Prevention
Exercise and the Cardiovascular Response
Fractures
Gait Disturbances
Multidimensional Function Assessment: Instruments
Occupational Therapy Assessment and Evaluation
Physical Therapy Services

Internet Resources

Abledata
http://www.abledata.com

American Board for Certification in Orthotics and Prosthetics
http://www.abcop.org

American Occupational Therapy Association
http://www.aota.org

American Physical Therapy Association
http://www.apta.org

National Rehabilitation Information Center
http://www.naric.com

Prosthetics
http://www.oandp.com

REFERENCES

Bateni, H., & Maki, B. E. (2005). Assistive devices for balance and mobility: Benefits, demands, and adverse consequences. *Archives of Physical Medicine & Rehabilitation*, *86*(1), 34–45.

Espinoza, S., & Walston, J. D. (2005). Frailty in older adults: Insights and interventions. *Cleveland Clinic Journal of Medicine*, *72*(12), 1105–1112.

Jagger, C., Barberger-Gateau, P., & Robine, J. M. (2005). Disability in older people: Indicators, process and outcomes. *Disability and Rehabilitation*, *27*(5), 209–212.

Hoenig, H., Nusbaum, N., & Brummel-Smith, K. (1997). Geriatric rehabilitation: State of the art. *Journal of the American Geriatrics Society*, *45*(11), 1371–1381.

Hogan, M. (2005). Physical and cognitive activity and exercise for older adults: A review. *International Journal of Aging & Human Development*, *60*(2), 95–126.

RELOCATION STRESS

In their now classic work, Litwak and Longino (1987) described three relocations that older adults commonly experience as they age. First, they may relocate to a desirable geographic location shortly after retirement. Some years later, they may return to an area to be close to family members (Koenig & Cunningham, 2001) or desired and needed medical care. As their health and care needs change, they may relocate to more supportive housing, such as assisted living, certified retirement communities, group homes, or senior apartments that provide various services.

Many older adults must relocate due to declining functional ability or worsening health. They are particularly likely to move if they are cognitively impaired and have limited assistance in their homes. This move is commonly to a long-term-care facility when their needs surpass the availability and capacity of community services and family caregivers. Among those with cognitive impairment, particular sequelae have been associated with relocation to a nursing home: incontinence, difficulty walking, and excessive nighttime activity. Even when facilities provide "aging in place," residents of more intense care environments, such as graduated retirement homes or nursing homes, have to relocate one or more times within the facility or to a new facility as their needs change.

Nearly all professionals working with older adults have had the experience of trying to help an older adult adjust to the process of relocation, in either a professional or a personal capacity. The widespread incidence of relocation stress in varying intensities among older adults should be of concern to health care professionals, who may be well positioned to prevent and help older adults recover from some of the stress of relocation and facilitate adjustment to the new home.

Identifying Relocation Stress

Two questions commonly considered by those helping older adults through the relocation process are (1) Who is most vulnerable to the stress associated with relocation? and (2) How is this stress identified? Relocation stress may occur with greater regularity and intensity when an older adult relocates precipitously, with limited choice or input into the decision. Involuntary moves in which there is little perceived improvement in living conditions may be especially stressful. Perhaps the most stressful situation, and ironically one of the most common, is when the relocation occurs in response to a health crisis. In this situation, the older adult may feel rushed into the relocation, have little choice in the location of the new home, and have minimal time to prepare. The decision to relocate is commonly made by the older adult's physician, adult child, or another family member (Johnson, Schweibert & Rosenmann, 1994). The situation may be especially stressful for ethnic elders who may fear discrimination when they relocate (Johnson & Tripp-Reimer, 2001).

Any older adult who relocates, but particularly those who fit the potentially most stressful scenario (e.g., precipitous move; little choice, especially due to cognitive impairment; little preparation; and limited perceived improvement in living conditions), may show signs of depression, anxiety, withdrawal, and morbidity (Lutgendorf et al., 2001). These may be accompanied by declines in the older adults' ability to perform basic and instrumental activities of daily living (Chen & Wilmoth, 2004), weight loss, anorexia, poor nutrition, falls, a decline in self-perceived health, reduced social support, and decline in sense of coherence (Johnson & Tripp-Reimer, 2001), intrusive thoughts and decreased vigor (Lutgendorf et al., 2001). Any of these manifestations may occur during the process of relocation decision making, during the actual move, or within 3 months afterward, particularly if the older adult has an unhealthy relocation transition style (Rossen & Knafl, 2003). The first month following relocation may be the most difficult period, and signs of stress may be most obvious. During the first week, older adults may experience elevated stress hormone levels (i.e., cortisol) that may begin to resolve by the fourth week (Hodgson, Freedman, Granger, & Erno, 2004). Within the first 3 months post-relocation, older adults may have lowered natural killer cell cytotoxicity that may make them vulnerable to infection (Lutgendorf et al., 2001).

Careful, multidisciplinary assessment during these periods is critical to identify signs of relocation stress. Use of a well-tested instrument to assess depression and changes in functional status may assist in early identification of relocation stress. However, it is also necessary to assess ability to perform activities of daily living (ADL), signs of infection, nutritional status, engagement in social behavior, physical activity level, sleep, and morbidity. These areas are equally important to assess in those who are cognitively impaired.

Preventing Severe Relocation Stress

As with most negative health situations, preventing severe relocation stress is a better approach than trying to minimize it once it is already present. Ensuring the older adult's participation in making the decision to relocate is the earliest preventive measure. This is a multidisciplinary task for those helping the older adult in the situation preceding relocation. Clearly, not all older adults will want to participate nor should they be expected to do so. Participation necessarily assumes some cognitive capacity and includes considering alternatives and exercising choice. Recognition that relocation is needed may not be as immediate for the older adult as for participating family members. Thus, professionals working with families that are contemplating relocation need to ascertain the degree of difference in view, if any, between the older adult and family members. This is best done by interviewing them separately. Family members should not pressure the older adult into the decision but instead discuss the benefits of the new location in terms of how it may improve living conditions. Participation and choice in selecting the new residence may help prevent severe relocation stress.

Beyond choice, careful preparation may minimize the stress of relocation. This also involves a multidisciplinary approach. For example, the case manager or social worker may establish the groundwork by having staff members of the new residence contact the older adult and family to begin to establish rapport and identify with the new location. The nurse practitioner or primary care physician should conduct a thorough assessment and transmit the results to those responsible for new residents at the new location. This may help ensure that the most appropriate and beneficial services and care are made available to the relocated older adult.

Each of these measures assumes that there is no emergency or acute need for relocation. However, this is commonly not the case. Hospitalized older adults often must relocate to the first available place (e.g., a nursing home) when their inpatient days have elapsed or to a place that they may have tentatively considered years earlier when they put their name on a waiting list. Alternatively, hospitalized elders might have to relocate to an adult child's or other relative's house with home care. When relocation occurs precipitously, it may seem that choice and participation are not possible. However, even limited participation by the older adult in the decision can be helpful. Deciding which belongings to take to the new residence, what new things are needed, and what will be done with belongings not taken may help minimize relocation stress, assuming that this is done in a fairly unhurried manner. Decisions about the new residence, such as room color and furniture arrangement, may help prevent severe relocation stress.

Anticipatory planning and preparation involve making visits to the new residence at different times of the day and week, meeting and visiting with residents and staff, having meals there, and viewing the new living space. It also includes asking and receiving answers to questions about such things as policies, special services, programming, and events.

Treating Severe Relocation Stress

Although preventive strategies are the optimal approach in relocating older adults, these may not always be used or effective. Most people who relocate experience varying degrees of stress. Such stress may facilitate adaptation because changes in behavior, attitudes, or both are necessary for older adults to adjust to a new residence. To minimize severe relocation stress, reminiscence therapy, massage, therapeutic touch, bibliotherapy, active listening, prayer, music therapy, art therapy, social programming, and linking new residents with a "buddy" who is not a newcomer for social support may be helpful. Pharmacological treatment for depression and anxiety may be needed in severe cases. Continuing assessment of nutritional status, self-care, and social behavior is needed to monitor progress. Older adults and their family members should participate in the process of assessment and intervention.

Despite more than 3 decades of research demonstrating the profound effects of relocation stress on older adults, precipitous, relatively unplanned, and involuntary relocation still occurs regularly. Professionals who work with older adults and their families should advocate for the older adults' choice, participation, and preparation to decrease the incidence of this largely preventable yet potentially damaging situation.

REBECCA A. JOHNSON

See also

Discharge Planning
Transitional Care

Internet Resources

AARP - Appropriations for Rural Housing
http://www.aarp.org/wwstand/testimony/1998hm3935.html

AARP - Caregiving: Housing Options
http://www.aarp.org/caregive/4-house.html

Consumer Information Center
http://www.pueblo.gsa.gov

REFERENCES

Chen, P. C., & Wilmoth, J. M. (2004). The effects of residential mobility on ADL and IADL limitations among the very old living in the community. *Journal of Gerontology: Social Sciences*, *59B*(3), S164–S172.

Hodgson, N., Freedman, V. A., Granger, D. A., & Erno, A. (2001). Biobehavioral correlates of relocation in the frail elderly: Salivary cortisol, affect, and cognitive function. *Journal of the American Geriatrics Society*, *52*, 1856–1862.

Johnson, R. A., Schwiebert, V. B., & Rosenmann, P. A. (1994). Factors influencing nursing home placement decisions: The older adult's perspective. *Clinical Nursing Research*, *3*(3), 269–281.

Johnson, R. A., & Tripp-Reimer, T. (2001). Relocation among ethnic elders: A review. *Journal of Gerontological Nursing*, *27*(6), 22–27.

Koenig, C. S., & Cunningham, W. R., (2001). Adulthood relocation: Implications for personality, future orientation, and social partner choices. *Experimental Aging Research*, *27*, 197–213.

Litwak, E., & Longino, C. F., Jr. (1987). Migration patterns among the elderly: A developmental perspective. *Gerontologist*, *27*(3), 266–272.

Lutgendorf, S. K., Tripp-Reimer, T., Harvey, J. H., Marks, G., Hong, S. Y., Hillis, S. L., et al. (2001). Effects of housing relocation on immunocompetence and psychosocial functioning in older adults. *Journal of Gerontology*: *Medical Sciences*, *56A*(2), M97–M105.

Rossen, E. K., & Knafl, K. A. (2003). Older women's response to residential relocation: Description of transition styles. *Qualitative Health Research*, *13*(1), 20–36.

RENAL SYSTEM

See
Kidney and Urinary System

RESPIRATORY SYSTEM

Aging has important effects on the structure and function of nearly all tissues of the body. These are quite significant in the respiratory system. Important physiologic changes occur with advancing age in pulmonary mechanics, gas exchange, respiratory control, and exercise capacity. These alterations are heavily influenced by genetic and environmental factors, particularly cigarette smoking, to further modify respiratory function. This information will be reviewed in detail below.

Pulmonary Mechanics

Respiratory Muscles and Chest Wall.

The respiratory muscles, including the diaphragm, the intercostal muscles, and accessory muscles, provide the necessary force to move the lung and the chest wall. Older age is associated with a modest decrease in respiratory muscle strength. Factors that may be involved in the decline of strength include decreased work capacity, temporal dispersion within motor units, and increased duration of motor potentials. Objective findings at older age show decreased maximal inspiratory pressure (MIP) and maximal expiratory pressure (MEP), as well as decreased chest wall compliance. Changes in chest wall compliance may occur secondary to intercostal cartilage calcifications, costovertebral joint arthritis, and kyphoscoliosis. Because of the increased rigidity of the chest wall, the effort of breathing requires additional work by the diaphragmatic and abdominal muscles.

Lung Recoil

The lungs and the chest wall are bound together by the potential pleural space and function as a bellows. At the end of an expiration, the tendency of the lungs is to recoil inwardly from the chest wall while the chest wall recoils outwardly. Increasing age produces stiffening of the chest wall, as well as increased compliance of the lung parenchyma.

Cross-sectional studies have shown a progressive age-related loss of lung elastic recoil after 20 to 25 years that results in increased lung compliance (Sparrow & Weiss, 1995). This loss of elastic force is possibly due to alteration of the orientation and location of individual elastic fibers. Inflammatory

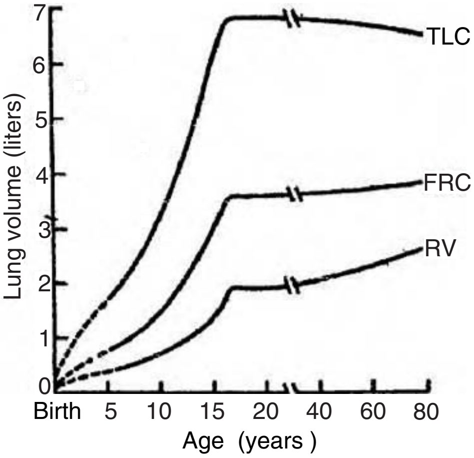

FIGURE R.1 Total lung capacity (TLC), functional residual capacity (FRC), and residual volume (RV) as functions of age from birth to 80 years for an "average" body build. Reproduced from Murray (1976), with permission.

processes in the lung that release oxidant and antioxidant enzymes may also affect this process.

Pulmonary Function

The stiffening of the chest wall and the increased compliance of the aging lung produces changes in several lung volumes and capacities, as depicted in Figure R.1. Although total lung capacity (TLC) remains fairly constant, vital capacity (VC) decreases and residual volume (RV) increases. As lung recoil decreases with advancing age, functional residual capacity (FRC) increases slightly. The closure of the small airways is also affected by aging, as there is closure of the small airways at a more distal position in the airway, so that airway closure starts to occur at a smaller exhaled tidal volume. The closing volume begins to exceed the sitting FRC at approximately 65 years of age (Chan & Welsh, 1998). This is significant in older persons, even while in a seated position, because they may have dependent closure of their small airways (i.e., terminal bronchioles) during tidal breathing and therefore decreased arterial oxygen tension.

Three separate factors have effects on the flow rates: muscular strength, elastic recoil, and lung volumes. Muscular strength and pressure produced by elastic recoil have a significant impact on the flow rate when lung volumes are large. However, they have less of an effect at low lung volumes. There is enough flow generated by the chest wall and lung elastic recoil until the airway narrows enough and prevents further flow. This is dynamic compression of the airways and it occurs fairly early, after exhalation of only 20% to 30% of the VC. The only force that continues to keep these airways open is the elastic recoil driving pressure. The elderly individual, with a decreased lung elastic recoil, will therefore have compression of these airways occur much earlier. This will produce a decrease in flow at low lung volumes and therefore result in a picture that is similar to someone with mild obstructive airways disease. Several parameters show age-related decline, including the forced vital capacity (FVC), forced expiratory volume in 1 second (FEV_1), and forced expiratory flow between 25% and 75% of the VC ($FEF_{25\%-75\%}$). The largest decline is seen in the $FEF_{25\%-75\%}$. The FEV_1 and FVC arc representative of flow rates at higher lung volumes, so they are more dependent on muscle strength than elastic recoil.

Gas Exchange

Age-related alterations of the mechanics of the lung and the chest wall also affect the gas exchange at the alveolar-capillary interface. The early closure of the small airways causes ventilation-perfusion mismatching. Other possible explanations for this mismatch include increased collagen content of the alveolar walls, airflow limitations due to anatomical alveolar duct and bronchiolar changes, decreased cardiac output, and decreased alveolar surface area. As a result of decreased alveolar surface area, the diffusing capacity of the lung for carbon monoxide (DLCO) loss is 4% to 8% per decade (Johnson, Badr, & Dempsey, 1994). P_aO_2 also declines slightly with advancing age.

Changes in dead space, both physiological and anatomical, can contribute to declining oxygenation. The anatomical dead space is the volume of the conducting airways, the trachea and the bronchi, whereas the physiological dead space is functionally defined as the volume of lung that does not eliminate CO_2 (West, 1990). These two measures are usually approximately equal, but with inequality of perfusion and ventilation, there can be an increase in the physiological dead space. In the elderly, there is an inequality of ventilation and perfusion, due to the decreased ventilation of the basal portions of the lung because of increased closing volumes, as explained previously. This inequality would increase the physiological dead space in the elderly without significantly increasing anatomical dead space. The presence of any coexisting disease, such as emphysema, may make this disparity larger.

Exercise Response in the Elderly

The reductions in lung function in the elderly may be more marked with exercise. There is loss of respiratory reserve, which is often unmasked by acute illness, surgery, or exercise (Johnson, Badr, & Dempsey, 1994). Respiratory mechanical changes with aging place a greater demand on the muscles of respiration, resulting in a lower tidal volume and a higher respiratory rate. The ventilatory responses to hypoxia and hypercapnia are diminished in the elderly. The reasons include decreased peripheral chemosensitiviry, decreased neural output to the respiratory muscles, deconditioning, and lower mechanical efficiency.

VO_2 max, which is defined as maximum oxygen consumption, progressively decreases with aging. Most of the decrease appears to be due to altered cardiovascular physiology and related responses, as well as a sedentary lifestyle, rather than to ventilatory limitation. Age-related loss of muscle mass may result in decreased ability of the respiratory muscles to contribute to ventilation.

The aged subject can exercise like a young subject at normal training intensities (50% to 75% of maximal VO_2 max), but when metabolic demands are increased or pulmonary function is diminished, the ventilatory response may be inadequate (Johnson, Badr, & Dempsey, 1994). Metabolic demand and pulmonary reserve decline in the older person. Because of substantial variability in pulmonary reserve at advanced age, it is more likely that exercise performance could be attenuated in some older subjects due to this mechanism. Such limitations in pulmonary reserve can be identified by standard pulmonary function tests (especially based on flow rates over the mid to lower lung volumes). Elderly people may not be able to meet respiratory demands under conditions of heat or altitude. These conditions produce a need for increased ventilation and competition for blood flow at a time when there is reduced alveolar-capillary reserve and reduced airflow (Johnson et al., 1994).

GANESH C. NATARAJAN
DAVID SPARROW

See also
Chronic Obstructive Pulmonary Disease
Cough Pulmonary Ambulism

REFERENCES

Chan, E. D., & Welsh, C. H. (1998). Geriatric respiratory medicine. *Chest*, *114*(6), 1704–1733.

Johnson, B. D., Badr, M. S., & Dempsey, J. A. (1994). Impact of the aging pulmonary system on the response to exercise. *Clinics in Chest Medicine*, *15*(2), 229–246.

Murray, J. F. (1976). *The normal lung*. Philadelphia: Saunders.

Sparrow, D., & Weiss, S. T. (1995). Respiratory system. In E. J. Masoro (Ed.), *Handbook of physiology* (pp. 475–483). New York: Oxford University Press.

West, J. B. (1990). *Respiratory physiology*, Baltimore: Williams & Wilkins.

RESPITE CARE

Respite care refers to short-term supervisory, personal, and nursing care provided to impaired older adults, typically those who cannot be left alone because of physical or mental disabilities. The purpose of respite care is to provide the informal caregivers of impaired older adults with temporary relief or respite from their caregiving responsibilities. Of all the services designed for community-dwelling impaired older adults, respite care is most firmly rooted in recognition of the social, primarily family, context within which caregiving occurs.

There are three primary forms of respite care: in-home respite care, inpatient respite care, and adult day care. All three forms provide "time-off" for caregivers but provide very different experiences for the care receiver. Adult day care is provided in a community setting to multiple impaired older adults. Depending on the caregiver's preference and ability to pay for the service, as well as the care receiver's illness severity, weekly day care schedules range from 1 to 5 days. In-home respite is provided in the impaired older adult's home by a respite care worker. Length and frequency of in-home respite visits vary widely, dictated by caregivers' desires and ability to pay for the service. Inpatient respite care involves a short-stay placement (usually 2 weeks) in a hospital or nursing home.

The need and rationale for respite care services emerged primarily because of overwhelming research evidence that caregivers are at substantial risk for psychological distress, clinical depression, social isolation, and perhaps exacerbation of physical illness and financial problems. More than 2 decades of evidence document the high proportion of caregivers who experience one or more of these problems (Vitaliano, Young, & Zhang, 2004). In addition, 25 years of research clearly demonstrates that the older persons at greatest risk of nursing-home placement are those without families and those whose families are no longer willing or able to tolerate the demands of home care. In addition, caregivers' levels of stress and well-being strongly predict institutionalization of the impaired relatives for whom they care (Bond & Clark, 2002). These facts fueled hope that respite care might also delay institutional placements of impaired older adults.

The number of respite care programs in the United States has grown exponentially during the past 2 decades. The greatest impetus to the growth of respite care was the reauthorization of the Older Americans Act (OAA) in 2000, which included the National Family Caregiver Support Program (NFCSP). As a result of adding the NFCSP to the OAA, states applying for funds to support services to older adults are required to implement respite care programs through local Area Agencies on Aging.

Research examining the effects of respite care services on caregiver well-being remains scant. Moreover, few of the studies available are randomized clinical trials—the research design required for compelling evidence. Nonetheless, the volume of research evidence on the effects of respite care on caregivers is growing slowly. At first glance, findings across studies appear widely inconsistent. Attention to two issues, however, brings considerable clarity to the apparent chaos. The two important issues are type of respite care service and the specific outcomes examined.

The strongest and most plentiful evidence of decreased caregiver burden and increased caregiver satisfaction has been found for adult day care services (Gaugler et al., 2003a, 2003b). Evidence for the effectiveness of in-home respite care is less plentiful and more mixed. Most studies, however, report positive effects (Hoskins, Coleman, & McNeely, 2005). The number of studies evaluating inpatient respite is very small, but they consistently fail to find evidence that this type of respite benefits caregivers (Landry, Hebert, & Preville, 2002).

The effects of respite care on caregivers also vary, depending on the specific outcome under investigation. Nearly all studies that examine caregiver satisfaction with respite care report positive findings—that is, the majority of caregivers report high levels of satisfaction with the respite care they receive. It has proven to be more difficult, however, to demonstrate positive effects in terms of reducing caregiver burden, increasing caregiver well-being, and reducing caregiver depression and anxiety. Nonetheless, recent evaluations of adult day care and in-home respite typically report some success in reducing caregiver burden or increasing caregiver well-being.

In contrast to studies that focus on the satisfaction and well-being of caregivers, there is no evidence that respite-care use delays institutionalization of the impaired older adult. Indeed, several studies report that receipt of respite care significantly increases the odds of institutional placement (Bond & Clark, 2002). It is unlikely that respite-care utilization has a causal effect on institutionalization. A more likely scenario is that highly stressed caregivers are more likely to both increase use of community-based services and subsequently seek institutional placement for the care recipient.

More recent research has focused largely on the factors that make respite-care services more or less attractive to caregivers and the characteristics of caregivers who do and do not use respite-care services. It is widely recognized that specific features of respite-care programs can have significant effects on their utilization. Flexibility of respite schedules, cost of respite care, and the rapport established between respite workers and their care recipients, for example, effect caregivers' decisions to use respite care and the length and frequency of use. Demographic and social status factors also are related to respite-care use. In general, high levels of education, income, and community involvement are related to more and longer use of respite care and other community services for older adults. There also are racial and ethnic differences in patterns of respite utilization. Because of cost, African Americans and Hispanics are less likely to have access to respite care than Whites. Nonetheless, when access is available, African American and Hispanic caregivers typically use respite care longer than White caregivers (Montgomery, Marquis, Schaefer, & Kosloski, 2002).

For the foreseeable future, the major challenges in respite care will be additional research designed to assess the impact of respite care on caregivers and, in the service sector, overcoming barriers to use. These are related issues. There is general agreement among researchers and service providers that too few caregivers use respite care, and that those who do initiate use too late in the care receiver's illness trajectory or use too little volume of care to make a sizeable reduction in caregiver burden.

Linda K. George

See also

Caregiver Burden
Consumer-Directed Care

Internet Resources

Caring Connections
www.caringinfo.org

Federal Source for Women's Health Information
www.4women.gov/faq/caregiver.htm

Helpguide
www.helpguide.org/older/respite_care.htm

REFERENCES

Bond, M. J., & Clark, M. S. (2002). Predictors of the decision to yield care of a person with dementia. *Australian Journal on Ageing*, *21*, 86–91.

Gaugler, J. E., Jarrott, S. E., Zarit, S. H., Stephens, M. A. P., Townsend, A., & Greene, R. (2003a). Respite for dementia caregivers: The effects of adult day service use on caregiving hours and care demands. *International Psychogeriatrics*, *15*, 37–58.

Gaugler, J. E., Jarrott, S. E., Zarit, S. H., Stephens, M. A. P., Townsend, A., & Greene, R. (2003b). Adult day service use and reductions in caregiving hours, effects on stress, and psychological well-being for dementia caregivers. *International Psychogeriatrics*, *15*, 37–58.

Hoskins, S., Coleman, M., & McNeely, D. (2005). Stress in carers of individuals with dementia and community mental health teams: An uncontrolled evaluation study. *Journal of Advanced Nursing*, *50*, 325–333.

Landry, M., Hebert, R., & Preville, M. (2002). Evaluation of a respite care program for the frail elderly and its effects on their informal caregivers. *Canadian Journal on Aging*, *21*, 371–383.

Montgomery, R. J. V., Marquis, J., Schaefer, J. P., & Kosloski, K. (2002). Profiles of respite use. *Home Health Care Services Quarterly*, *21*, 33–63.

Vitaliano, P. P., Young, H. M., & Zhang, J. (2004). Is caregiving a risk factor for illness? *Current Directions in Psychological Science*, *13*(1), 13–16.

RESTRAINTS

A physical restraint is defined according to its functional application and is any device, material, or equipment that is attached to or adjacent to a person's body, cannot be removed easily, and restricts freedom of movement. In addition to vest restraints, hand mitts, and belts, siderails that limit voluntary movement out of bed (e.g., bilateral full-length siderails or four half rails) are also considered restraints.

Physical restraints are applied in hospitals and nursing homes for three primary reasons: fall risk, treatment interference, and behavioral symptoms. To date, no studies have demonstrated that restraints effectively safeguard patients from injury, protect treatment devices, or alleviate behavioral symptoms such as wandering or agitation. In fact, several studies suggest that physical restraints are associated with falls, serious injuries, and decreased cognitive function.

Nevertheless, many health care professionals and other caregivers see few alternatives to restraint use in some situations. Hospitals and nursing homes often do not have personnel with expertise in aging or with the requisite skills for assessing and treating clinical problems specific to older adults. Fears about legal liability (albeit misplaced), lack of interdisciplinary discussions about decisions to restrain, and staff perceptions about resident behaviors also influence restraint practices. Insufficient staffing levels and the costs associated with hiring additional employees have long been regarded as obstacles to minimal use of physical restraints. In fact, the opposite is true because data show that caring for nursing-home residents without restraints is less costly and needs no more staff than caring for residents who are restrained (Rantz et al., 2004).

There is substantial evidence that restraints can cause considerable harm—they reduce functional capacity as the person quickly loses muscle strength, steadiness, and balance when restricted to a bed or chair. Because of the immobilization that physical restraints cause, they are associated with functional incontinence, aspiration pneumonia, circulatory obstruction, cardiac stress, skin abrasions or breakdown, poor appetite, and dehydration. In several studies, restraint use has been associated with delirium (McCusker et al., 2001). Attempting to restrain a frightened, delirious patient increases his or her levels of panic and fear producing angry, belligerent, or combative behavior. Other emotional responses include a sense of abandonment or desolation, loss of control, reduced self-esteem, depression, and withdrawal. A vicious circle occurs when the harms of restraints are combined with the characteristics of persons likely to be restrained—usually those of advanced age who are physically and mentally frail, prone to injury and confusion, and experiencing invasive treatments.

Restrained persons may incur injuries when attempting to remove restraints or ambulating while restrained. These actions can lead to asphyxiation and death, resulting from gravitational chest compression when the person is suspended by a vest restraint inhibiting the ability to inhale or entrapped within rails (Miles, 2002). The FDA, in response to the reports of restraint-related deaths, mandates that all devices carry a warning label concerning potential hazards.

It is now well established that restraint use, including siderails, in nursing homes can be significantly reduced without increasing serious injuries or hiring more staff (Capezuti et al., in press; Neufeld et al., 1999; Rantz et al., 2004). This is accomplished through implementing alternative approaches to assessing, preventing, and responding to behaviors that routinely lead to restraint use. Such a change in approach requires a fundamental change in philosophy and attitudes at the institutional and caregiving levels. In settings where restraints have been reduced (or eliminated), there is strong emphasis on individualized, person-centered care; normal risk taking; rehabilitation and choice; interdisciplinary team practices; environmental features that support independent, safe functioning; involvement of family and community; and administrative and caregiver sanction and support for change. It is also crucial to have involved professionals, particularly medical directors and expert nurses with education, skill, and expertise in both geriatrics and individualized care.

Although legislation and external regulation or control do not change beliefs or entirely alter entrenched practice, the Nursing Home Reform Act (enacted in 1990) significantly impacted care in nursing homes generally and restraint use specifically. Guidelines for surveyors of long-term-care facilities state that use of restraints must occur within a context of rigorous clinical assessment and comprehensive care planning that weighs risks against potential benefits and informs the resident or representative of those risks. Interventions for specific problems must be tried and documented; if restraints are used, staff must document that they are the least restrictive alternative, along with specific indicators warranting their use.

Similarly, in hospitals, restraint standards developed by the Joint Commission on Accreditation of Healthcare Organizations have led to reductions in overall physical-restraint use as well as changes in patterns of use. Currently, restraints tend to be used more to prevent treatment disruption than to avert falls and related injuries; thus, arm/limb restraints are more frequently employed than vest/waist restraints (Minnick, Mion, Leipzig, Lamb, & Palmer, 1998). Reduction of restraints use in acute care has been successfully implemented without increases in falls or patient-initiated discontinuation or dislodgment of therapeutic devices (Mion et al., 2001). Standards mandate that restraints be used only to improve well-being in cases in which less restrictive measures have failed to protect the patient or others from harm. In addition, clinicians, in consultation with the patient's own provider, must provide continual individualized assessment and reevaluation of the patient as long as they are restrained. Direct-care staff must also be trained in the proper and safe use of restraining devices.

Current approaches to restraint reduction vary along a continuum from promotion of individualized care, free of any restraints, to an attitude of tolerance for restraint use under certain circumstances. To some extent, successful (although incomplete) reduction of physical restraints in nursing homes underscores the need to achieve the same changes in hospitals, where disproportionately high incidences of iatrogenesis occurs, much of it exacerbated by the use of physical restraints and adverse reactions to psychoactive drugs. The resulting complications—especially delirium, pressure ulcers, infections, and fall-related injuries—can add dramatically to loss of function, thus increasing the cost of care.

Siderails

Siderails are considered physical restraints and they have been used primarily to prevent individuals from falling from bed. However, there is evidence to suggest that raised siderails may actually cause falls when patients try to transfer over them or when patients can get trapped between the rungs. Like other physical restraints, siderails can cause injuries and even death (Miles, 2002). Reducing the use of siderails is also associated with fewer bed-related falls and injuries (Capezuti et al., 2007). In March 2006, the FDA issued design guidelines for hospital beds to reduce entrapment injuries. The guidelines also include recommendations for manufacturers of new hospital beds and suggest ways for health care facilities to assess existing beds.

Conclusion

Care that does not involve the use of any physical restraints is increasingly considered the standard of care for elders in all health care settings. Such a standard challenges professional caregivers to conduct comprehensive assessments of patients and residents in order to make sense of individual behaviors. These assessments, in turn, suggest a wide range of interventions that enhance physical, psychological, and social function, as well as to acknowledge and affirm the uniqueness and dignity of the older person.

Joan M. Dunbar
Elizabeth Capezuti

See also

Behavioral Symptoms in Patients With Dementia
Psychotropic Medications in Nursing Homes

Internet Resources

American Geriatrics Society
http://www.americangeriatrics.org/products/positionpapers/restraintsupdatePF.shtml

Centers for Medicare & Medicaid Services
http://www.cms.hhs.gov

Kendal's "Untie the Elderly"
http://ute.kendaloutreach.org/

U.S. Food and Drug Administration, Hospital Bed Safety
http://www.fda.gov/cdrh/beds/index.html
http://www.fda.gov/bbs/topics/NEWS/NEW00280.html

REFERENCES

Capezuti, E., Wagner, L. M., Brush, B. L., Boltz, M., Renz, S., & Talerico, K. A. (2007). Consequences of an intervention to reduce restrictive siderail use in nursing homes. *Journal of the American Geriatrics Society*, *55*, 334–341.

McCusker, J., Cole, M., Abrahamowicz, M., Han, L., Podoba, J. E., & Ramman-Haddad, L. (2001). Environmental risk factors for delirium in hospitalized older people. *Journal of the American Geriatrics Society*, *49*(10), 1327–1334.

Miles, S. H. (2002). Deaths between bedrails and air pressure mattresses. *Journal of the American Geriatrics Society*, *50*(6), 1124–1125.

Minnick, A. F., Mion, L. C., Leipzig, R., Lamb, K., & Palmer, R. M. (1998). Prevalence and patterns of physical restraint use in the acute care setting. *Journal of Nursing Administration*, *28*(11), 19–24.

Mion, L. C., Fogel, J., Sandhu, S., Palmer, R. M., Minnick, A. F., Cranston, T., et al. (2001). Outcomes following physical restraint reduction programs in two acute care hospitals. *Joint Commission Journal on Quality Improvement*, *27*(11), 605–618.

Neufeld, R. R., Libow, L. S., Foley, W. J., Dunbar, J. M., Cohen, C., & Breuer, B. (1999). Restraint reduction reduces serious injuries among nursing home residents. *Journal of the American Geriatrics Society*, *47*(10), 1202–1207.

Rantz, M. J., Hicks, L., Grando, V., Petroski, G. F., Madsen, R. W., Mehr, D. R. (2004). Nursing home quality, cost, staffing, and staff mix. *Gerontologist*, *4*, 24–38.

RETIREMENT

The term *retirement* has multiple meanings. On a broad level, it signifies a set of economic and societal practices that help to manage the size of the labor force. The term also designates a social status that has become established as a historically new stage of the life course. At the level of the individual, retirement can refer to a changed relationship to the economy, to the temporal event of withdrawal from work, and to a personal transition from one life role to another that entails a process of adaptation

Various criteria are used to classify individuals as retired—for example, reduced labor-force participation, cessation of a career, receipt of pension income, willingness to self-identify as retired, or some combination of these. Most people understand retirement to be an older worker's cessation of full-time employment coupled with reliance on public or private pensions for some portion of income.

Retirement can be a crisp, single event, perhaps concluding a career job or occupation. Retirement can also occur as a set of transitions—exit and reentry, part-time or intermittent employment—that bridges the adult work role with final withdrawal from the labor force. Recent research has raised awareness of more variable and indeterminate patterns of retirement that have arisen due to changing labor markets and pension incentives.

Retirement as we know it today—withdrawal from the labor force coupled with the earned entitlement to pension income—is a relatively recent development in industrial societies (Gruber & Wise, 1999). As a matter of economic policy, retirement can be seen as a device for drawing older workers out of the labor force and financing partial replacement of their lost wages. The emergence of modern retirement practices to support this policy awaited several historical trends, among them the enhanced productive capacity of industrialized economies, growth in the size of older populations, and the rising power of governments to manage national pension systems.

Developments in the United States such as the establishment of old-age pensions under Social Security, the expansion of employers' pensions, and the private accumulation of wealth contributed to a decline in the labor-force participation of older adults. In 1950, 45.8% of men aged 65 and older were in the labor force, compared to only 19.8% in 2005 (with roughly half of this employment now consisting of part-time work). Participation among men aged 55 to 64 has also dropped. Women as well had higher retirement rates over these decades, although this trend is masked by women's historical rise in job-holding as a group. Retirement practices evolved to such an extent that, by the 1980s, so-called early retirement (i.e., before age 65) became the norm. The trend toward earlier retirement then leveled off; in recent years, the labor-force participation of older workers has even risen slightly (Wiatrowski, 2001).

The Decision to Retire

Although most older workers eventually retire, there can be great latitude in the timing of this life step. Factors involved in the retirement decision include pension availability, prospects for income security over the longer term, opportunities for continued employment, workplace conditions and administrative rules, personal attitudes about work and leisure, family responsibilities, and continued ability to perform on the job. Married persons may make mutual decisions, taking the spouse's employment, pension, and health into account. Among these many considerations, wealth and health are of paramount importance as contributing factors in the decision to retire.

Few adults can manage to fund retirement from personal savings alone. Thus, pension availability is the necessary condition for retiring because of the need to replace income lost by withdrawal from work. Pension eligibility and age incentives, in turn, bring various societal, organizational, and personal objectives to bear on the individual decision.

Until recently, retired-worker pensions under Social Security could be claimed at age 65 for full benefits and at age 62 for reduced benefits after having worked and contributed for at least 10 years. New policies, however, will favor extended work careers. In 2003, the normal age for full Social Security benefits began advancing gradually to age 66 and will reach age 67 by 2027. Early retirement at age 62 is still possible, but with a greater reduction in benefits. Delayed retirement will bring a larger benefit. Congress has also removed limits on the amount of money that most recipients can earn without losing part of their benefits. The earnings limit remains in effect for early retirees, thus encouraging people to wait until the normal age to begin receiving retirement benefits.

Employer-provided pensions also guide the timing of retirement. Employers sponsor pensions to serve different objectives: to encourage long tenure, to remain competitive in hiring, as an outcome of collective bargaining, as a device to keep promotion lines open to younger staff, or as a means to shed workforces of older personnel who are believed eventually to become less productive or too costly. Pension plans have widely varying characteristics and are unevenly distributed among occupational groups. They are more common and benefit levels more generous in industries characterized by large, highly organized firms and strong labor unions. Most government workers are covered. In 2002, about half of all full-time employees participated in one or more retirement plans, a rate of coverage that has declined somewhat since the mid-1990s. The mix of plan types, however, has shifted from traditional "defined benefit" plans to a now dominant proportion of "defined contribution" plans as primary or supplemental pension sources (Munnell, Lee, & Meme, 2004).

In defined benefit plans, employees are promised a steady benefit that can be claimed after meeting an age and length-of-service requirement. Many such plans have early retirement options, and benefit formulas are often structured to encourage retirement at an optimal age beyond which there is little financial advantage to stay on the job. Unlike Social Security, few defined pension benefits are regularly adjusted for increases in the cost of living, leaving their projected purchasing power vulnerable to inflation. Under defined-contribution plans, such as the 401(k) type, the employer and/or employee can make contributions of a specified amount to the employee's account. There is no fixed future benefit; retirement income is drawn from the earnings of the account that has been managed or directed by the employee. This shift from corporate paternalism to employee self-reliance puts greater responsibility, as well as future risk, on the individual. Age incentives for retirement are not a feature of defined-contribution plans, yet such savings-style plans increase the feasibility of early retirement because distributions can begin at age $59^1/_2$. Withdrawals must begin by age $70^1/_2$. Upon taking a distribution, the prospective retiree must decide how to annuitize these sums to provide a long-term stream of income.

Given a reduction in the expenses associated with working, retirees need to replace about 65% to 85% of previous earnings to maintain a comparable standard of living, a goal that nevertheless eludes the majority of retirees if they rely on employer and Social Security pensions alone (Schulz, 2001). Despite employer pensions and efforts to encourage private saving, Social Security remains the major source of income for more than half of all beneficiaries.

A second major factor in retirement decisions is the worker's health and continued ability to perform on the job. Approximately 20% to 30% of all retirements involve ill health or disability as the primary reason for retirement. Access to health insurance will also be a consideration for workers who want to exit their jobs prior to the Medicare eligibility age of 65.

Retirement under mandatory or compulsory age rules is no longer the factor that it was in the past. Federal age-discrimination laws have virtually eliminated permissible mandatory retirement ages for jobs in private industry. The legislated prohibition of mandatory retirement should not obscure the fact that older workers may still face subtle age discrimination, negative perceptions about their productivity, and local pressure to retire (Hardy, 2006).

One significant development has been the growth in workers' expressed willingness to retire, to the point that a preference for leisure has become the primary self-reported reason for retirement. Marketers of travel, recreation, and financial services have encouraged strong demand for retirement by celebrating the consumption of leisure as a legitimate lifestyle. Retirement is promoted as a time for release and self-development in advance of the frailty that heralds death.

In general, workers exhibit more control over their retirement decisions to the extent that they have had regular, stable employment and enjoy relative social-class advantages. However, some workers leaving the labor force trade a history of disability or chronic unemployment for early retirement. Strained financial circumstances cause other workers to forego retirement. Finally, professionals and the self-employed, having continued employment opportunities and stronger personal investments in their identity as workers, are occupational groups more likely to stretch out their labor-force attachment.

Adaptation to Retirement

Early conceptions about possible retirement adaptation, developed while the retirement role was still gaining popular acceptance, foresaw retirement as a stressful transition and a "crisis" for personal identity. Research reports from longitudinal studies of workers' experience before and after retirement concluded instead that there is likely to be continuity of well-being and activities over the transition from work to retirement. This research has disclosed that a more satisfactory retirement experience is had by individuals who have better health, greater income, a stronger social network, and an adaptive personality—circumstances that favor adjustment at all stages of the life course. Serious dissatisfaction with retirement happens when retirement occurs unexpectedly, coincides with another negative life event such a spouse's illness, or when long-standing personal problems continue after withdrawal from work.

Adaptation is enhanced by a process of having anticipated and accepted retirement in advance of the event. Although few older workers participate or have the opportunity to participate in formal planning programs, financial and lifestyle advice about retirement is widely available (Vitt, 2003). Most preparation for retirement is informal and involves some information-seeking and anticipatory rehearsal of the retirement role. Although the role of retired person may never develop the specificity of the work role, there are certain expectations of retirees that they remain active, independent, self-reliant, and not interfere at their former place of work. The vagueness and flexibility of the retirement role is a particular benefit to retirees whose diminished health and financial resources limit their ability to participate.

The satisfaction with retirement expressed by most retirees may be tinged with ambivalence about the simultaneous freedom and marginality of an ex-worker status (Weiss, 2005). Contrary to the widely held notion that retirement often has negative consequences for health, epidemiological studies have consistently demonstrated that the event of retirement does not influence the risk of decline in physical or mental health. Indeed, considerable numbers of retirees report that retirement has a beneficial effect on their health. Marital discord, another supposed negative outcome of retirement, is also far less common than is generally thought.

Depending on their circumstances, retirees exhibit a wide variety of lifestyles. No particular level of leisure participation or social engagement has been shown to be the sole formula for a satisfactory retirement. Recreation, tourism, and travel certainly do preoccupy some people, and others use retirement as the opportunity to take up pursuits that they have long deferred, such as further education or skill development, a time-consuming hobby, or even a new line of work. Approximately one-quarter of retirees do some part-time work after retirement. A lot of retirement time actually becomes absorbed by mundane tasks of household maintenance and by tending relationships with friends and family members. Aside from formal employment, retirees remain productive as they assist their children and grandchildren in various ways, undertake care and support for other relatives, and volunteer their time and skills within their churches and communities. Despite the powerful, popular image of Sunbelt retirement, permanent or seasonal migration to retirement havens or resort communities is undertaken by a relatively small percentage of people. Retirement is a status largely lived out in one's same community, where there is available a continuity of roles, activities, and relationships.

David J. Ekerdt
Julie F. Sergeant

See also

Pensions and Financing Retirement
Social Security

Internet Resources

Center for Retirement Research at Boston College
http://www.bc.edu/centers/crr/

Pension Research Council
http://prc.wharton.upenn.edu/prc/prc.html

Social Security Administration
http://www.ssa.gov

U.S. Department of Labor (Retirement Plans, Benefits & Savings):
http://www.dol.gov/dol/topic/retirement/index.htm

REFERENCES

Gruber, J., & Wise, D. A. (Eds.). (1999). *Social security and retirement around the world*. Chicago: University of Chicago Press.

Hardy, M.A. (2006). Older workers. In R. H. Binstock & L. K. George (Eds.), *Handbook of aging and the social sciences* (6th ed., pp. 201–218). San Diego, CA: Academic Press Elsevier.

Munnell, A. H., Lee, J. G., & Meme, K. B. (2004). *An update on pension data*. Issue Brief 20. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Schulz, J. H. (2001). *The economics of aging* (7th ed.). New York: Auburn House.

Vitt, L. A. (Ed.) (2003). *Encyclopedia of retirement and finance*. Westport, CT: Greenwood Press.

Weiss, R. S. (2005). *The experience of retirement*. Ithaca, NY: Cornell University Press.

Wiatrowski, W. J. (2001). Changing retirement age: Ups and downs. *Monthly Labor Review*, *124*(4), 3–12.

RETIREMENT COMMUNITIES

See

Continuing Care Retirement Communities
Naturally Occurring Retirement Communities (NORCs)

RHEUMATOID ARTHRITIS

Rheumatoid arthritis is a progressive disabling condition that results in pain, joint damage, and functional loss, and it is associated with profound economic consequences in terms of lost wages, disability benefits, hospital costs, nursing-home costs, home-care costs, and professional and medication expenses. Many patients with rheumatoid arthritis fear loss of independence, and the disease has been associated with psychological distress, depression, and anxiety. A multidisciplinary approach to treating patients with rheumatoid arthritis, as well as early initiation of treatment, may improve quality of life and outcomes.

Epidemiology

Among the general adult population, rheumatoid arthritis most commonly occurs in the third to fifth decades, with a prevalence rate in the population of 0.3% to 3%. Several authors have divided this disease into two subsets: adult-onset rheumatoid arthritis (AORA) and elderly onset (after age 60) rheumatoid arthritis (EORA), each with its own distinctive characteristics. In most people, disease onset occurs prior to age 60; however, there is a distinct category of patients who develop this disease after the age of 60. New cases of EORA have been reported among 14% to 55% of rheumatoid arthritis cases. In the AORA population, women are more frequently affected than men, with a ratio of 2:1 to 3:1; however, with increasing age, the incidence in men rises, with the ratio becoming 1:1.

Diagnosis

The diagnosis of rheumatoid arthritis in the elderly is made when characteristic symptoms are present. The majority of patients may have an indolent onset of disease, with progressive pain, swelling, and morning stiffness of characteristic joints: proximal interphalangeal joints, metacarpophalangeal joints, wrists, elbows, shoulders, hips, knees, ankles, and metatarsophalangeal joints. In 30% of patients, the onset is acute, with an asymmetrical presentation. A complete history, physical examination, and laboratory evidence of inflammation are necessary to make the diagnosis of rheumatoid arthritis. Radiographs of the hands and other involved joints with evidence of periarticular osteopenia or marginal erosions support the diagnosis. A complete blood count, chemistries, and serologies such as rheumatoid factor, antinuclear antibody, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and anti-cyclic citrinullated peptide antibiody titers (anti-CCP) should also be obtained.

Despite an increasing prevalence of rheumatoid factor positivity in up to 40% of healthy elderly, rheumatoid factor is positive in only 32% to 58% of elderly patients presenting with new-onset disease. This compares with 80% positivity in AORA. Although the onset may be abrupt, several authors describe a milder presentation in elderly seronegative patients, with polymyalgia symptoms and frequent axial (i.e., shoulder and hip) involvement. Constitutional symptoms such as weight loss and a functional decline may accompany these symptoms. Patients who are rheumatoid factor positive have been described as having more persistently active disease, greater functional decline, more radiographic erosions, and increased mortality when compared with seronegative patients. Other differences between EORA and AORA include less frequent metatarsophalangeal joint involvement and fewer subcutaneous nodules in patients who are rheumatoid factor negative.

Older patients with long-standing disease may have joint deformities, synovitis, nodules, and radiographic erosions. Laboratory tests such as ESR and CRP are elevated. Anemia is common is patients with rheumatoid arthritis. Often the indices are consistent with anemia of chronic disease; however, a mixed etiology may be present and should be evaluated thoroughly.

Two other disease entities have been described in the elderly and may be difficult to distinguish from seronegative rheumatoid arthritis. These diseases have been described as variants of rheumatoid arthritis or as overlapping with the spectrum of the disease. First, polymyalgia rheumatica needs to be considered when evaluating an elderly patient with an acute presentation of symmetrical shoulder pain and an elevated ESR and CRP. The distinction may be difficult to make, and treatment with corticosteroids is effective for both entities. The other possible differential diagnosis is remitting seronegative symmetrical synovitis with pitting edema. This is a relatively rare disease described in elderly men, with a typical presentation of acute synovitis involving the wrist, carpal joints, and flexor digitorum tendon sheaths and evidence of pitting edema of the dorsum of the hands. Other upper- and lower-extremity joints may be involved. Rheumatoid factor is negative, and HLA association is with B27 and B7 (Schwab & Albert, 2001).

Crystal arthropathies such as polyarticular gout and calcium pyrophosphate deposition disease may present similarly to rheumatoid arthritis. Synovial fluid analysis and radiographs help make the distinction. Elderly patients with new-onset disease may be difficult to diagnose, especially if they present with polyarticular joint involvement, myalgias, negative serologies, and constitutional symptoms. In these situations, other diagnostic possibilities include viral and bacterial infections, connective tissue disorders such as systemic lupus erythematosus and Sjögren's syndrome, metabolic disorders, and malignancy.

Although the differential diagnoses appear straightforward, diagnosis in the elderly may be hindered by obtaining information from cognitively impaired patients; the presence of multiple coexisting diseases, which may confound history and physical examination; the increasing frequency of positive serologies in elderly patients; and difficulty obtaining laboratory studies and radiographs in nonambulatory patients, who may not have the social and financial support to obtain appropriate medical care.

Treatment

Although the treatment strategy for rheumatoid arthritis in the elderly is similar to that used for younger patients, treatment in this high-risk group is a challenge (Albert & Schwab, 2001). The goal of therapy is to relieve pain, diminish disability and joint destruction, and improve quality of life and functional outcome. Multiple problems are encountered with increasing age. The risk of drug toxicity is increased secondary to age-related alterations in pharmacokinetics and pharmacodynamics. Polypharmacy, often found in the elderly, can substantially increase the risk of drug interactions and adverse reactions. Multiple co-morbid conditions may alter the metabolism and excretion of prescribed medications, suggesting lower initial doses for most older patients. "Start low and go slow" is the general therapeutic guideline for drug dosages. In addition to patient education and counseling, an exercise program should be prescribed to improve functional outcomes.

Other concerns such as cognitive dysfunction, financial constraints, and limited social support influence treatment decisions. For instance, a practitioner may decide on a milder, less toxic treatment regimen for a patient with multiple co-morbid conditions to diminish drug toxicity, especially if physician visits are infrequent and blood monitoring is not available. A multidisciplinary team approach may help diminish obstacles.

The choice of drug therapy for a particular person depends on the progression of the disease, toxicity of the drug, and the individual's coexisting conditions (American College of Rheumatology Ad Hoc Committee on Clinical Guidelines, 2002). The current treatment strategy includes the early initiation of disease-modifying agents to retard damage and ultimately diminish disability. The potential toxicity of any drug needs to be weighed against the morbidity caused by the disease. These drugs are equally effective in the elderly as they are in younger persons, but their toxicities may be more profound in the elderly because of pharmacokinetic and pharmacodynamic alterations, drug interactions, and coexisting conditions that may alter drug metabolism and excretion.

Simple analgesics such as acetaminophen are ineffective. Nonsteroidal anti-inflammatory drugs (NSAIDs) are effective in patients with mild disease only but may not be well tolerated in the elderly due to their side effects. As a result of the controversy resulting from studies demonstrating increased cardiovascular events with certain cyclooxygenase 2 inhibitors and nonselective NSAIDs, the U.S. Food and Drug Administration (FDA) requires that all NSAIDs carry box warnings of increased cardiovascular events. In addition, other side effects of traditional NSAIDs include gastrointestinal inflammation, ulceration (reported in the small and large bowel), bleeding and perforation, nephrotoxicity, hepatoxicity, volume overload, central nervous system effects of confusion and cognitive impairment, and hematological abnormalities such as thrombocytopenia, neutropenia, and hemolytic anemia. Increasing age, history of peptic ulcer disease, concomitant corticosteroid or anticoagulant use, cigarette smoking, alcohol use, and ingestion of multiple NSAIDs have been identified as risk factors for gastrointestinal complications. Caution must be exercised when prescribing cyclooxygenase-2 inhibitors to all patients but especially older adults who may not be aware of underlying cardiovascular disease. The cyclooxygenase-2 inhibitors, valdecobix and rofecoxib, have been withdrawn from the market due to their reported toxicities while celecoxib remains available.

Hydroxychloroquine seems to be well tolerated in the elderly. Side effects include gastrointestinal discomfort, rash, photosensitivity, and, rarely, retinal toxicity. Patients should obtain biannual ophthalmological examinations, especially if they have coexisting ocular disease such as cataracts or macular degeneration. The role of corticosteroids in treating rheumatoid arthritis is extremely controversial because of the potential toxicities of osteoporosis, diabetes, cataracts, glaucoma, anxiety, delirium, and atherosclerosis. Although these agents are effective in reducing inflammation, they should be used with great caution and at the lowest effective dose. Antiresorptive therapy should be started simultaneously to diminish potential bone loss, especially in a population in which osteoporosis is prevalent.

Other second-line agents such as methotrexate and sulfasalazine appear to be well tolerated in the elderly. Methotrexate is often the agent of first choice because of its early onset of action and high efficacy-to-low-toxicity ratio. The primary toxicity of methotrexate is hepatic and hematological and requires frequent surveillance of liver function and blood count. Starting doses are often low in the elderly and slowly titrated. The primary toxicity of sulfasalazine is gastrointestinal problems; liver function and hematological abnormalities are rare. Other agents such as cyclosporine, azathioprine, parenteral gold, oral auranofin, and penicillamine are less popular in this age group. Specific side effects include bone-marrow toxicity, nephrotic syndrome with parenteral gold, and skin rash and dysgeusia with penicillamine. Leflunomide, an inhibitor of pyrimidine biosynthesis, has been shown to be effective in reducing disease activity. Side effects include rash, liver-function abnormalities, alopecia, and gastrointestinal symptoms.

Biologic therapies have been shown to modify the course of this disease (Klippel, 2000). These agents include anticytokine therapy such as etanercept, a recombinant human tumor necrosis factor (TNF) receptor fusion protein; infliximab, an anti-TNF alpha antibody; adalimumab, a human monoclonal antibody; and anakinra, an interleukin-1 receptor antagonist. The anti-TNF agents inhibit the cytokine, TNF, which is a proinflammatory cytokine that contributes to the pathogenesis of rheumatoid arthritis. Side effects have been described with etanercept. In addition to injection-site reactions, serious infections such as tuberculosis, atypical mycobacterial infections, and other opportunistic infections have been described. Other potential toxicities include demyelinating disease and development of lymphoma, pancytopenia, and heart failure. Serious infections have been reported with anakinra as well. Clinical trials are underway to assess the efficacy and safety of newer biologic agents. Rituximab, a B-cell depleting monoclonal antibody, is currently being investigated (Emery et al., 2006). Abatacept, a selective costimulation modulator that inhibits full T-cell activation, has been approved by the FDA for patients who have inadequately responded to DMARDs or failed TNF antagonists (Kremer et al., 2006). Although current results are promising, further information is required to assess their long-term efficacy, safety, and toxicity in all patients.

EDNA P. SCHWAB

See also

Osteoarthritis

Internet Resources

American College of Rheumatology
http://www.rheumatology.org/public/factsheets/ra_new.asp

Arthritis Foundation
http://www.arthritis.org

Medline Plus
http://www.nlm.nih.gov/medlineplus/rheumatoidarthritis.html

REFERENCES

American College of Rheumatology Ad Hoc Committee on Clinical Guidelines (2002). Guidelines for the management of rheumatoid arthritis: 2002 update. *Arthritis & Rheumatism*, *46*, 328.

Boers, M. (2006). Abatacept in rheumatoid arthritis: A new branch on the "biologics" tree. *Annals of Internal Medicine*, *144*, 933–935.

Emery, P., Fleischmann, R., Filipowics-Sosnowska, A., Schechtman, J., Szczepanski, L., Kavanaugh, A., et al. (2006). The efficacy and safety of rituximab in patients with active rheumatoid arthritis despite methotrexate treatment. *Arthritis & Rheumatism*, *54*, 1390–1400.

Klippel, J. H. (2000). Biologic therapy for rheumatoid arthritis. *New England Journal of Medicine*, *343*, 1640–1641.

Kremer, J. M., Genant, H. K., Moreland, L. W., Russell, A. S., Emery, P., Abud-Mendoza, C., et al. (2006). Effects of abatacept in patients with methotrexate-resistant active rheumatoid arthritis. *Annals of Internal Medicine*, *144*, 865–876.

Schwab, E. P., & Albert, D. (2001). Arthritis in the elderly. In M. Weisman & M. E. Weinblatt (Eds.), *Treatment of rheumatic diseases* (2nd Ed.). Philadelphia: W. B. Saunders.

RISK ASSESSMENT AND IDENTIFICATION

Risk assessment allows clinicians to target services and interventions to individuals. This has the potential to increase access to services for individuals who are most likely to benefit, resulting in improved outcomes and efficient use of resources. Risk assessment may be particularly helpful at the time of care transitions. Risks are not necessarily fixed; an individual's risk may decrease or increase over time as conditions evolve or the environment changes. Risk assessment can be viewed as an activity that aims to identify elders who are more vulnerable to declines in health. This approach recognizes vulnerability as more than the sum of existing medical conditions and underscores the importance of assessing ongoing function and adverse environmental conditions that significantly increase the risk of functional decline or death for all elders.

Clinical teams can use clinical and demographic characteristics to identify elders at increased risk for functional decline or death. A large number of risk factors have been identified in the medical literature. This discussion focuses on those risks that have immediate or intermediate impact—typically less than 4 years—and those that are important for interdisciplinary team assessments and care planning. The recognized risk factors that contribute to important health outcomes can be divided into four groups: demographics and socioeconomic status (SES); function; health behaviors; and diagnoses, conditions, and associated treatments.

Group I: Demographic and SES Domains

An individual's age influences his or her response to disease and chances of functional recovery, decline, and death, even after accounting for multiple other risk factors. Gender and marital status, especially recent loss of a spouse, have been associated with differences in health outcomes, may play some role in patient health care choices, and are relevant for future medical care. Measures of caregiver availability and social support may be more important for identifying risk and predicting future needs, access, and discharge planning.

The importance of language for effective communication and literacy is clear and is relevant for interpreting an individual's needs. Ethnicity has been associated with differences in health beliefs, behaviors, and content of self-report. Education, health literacy, and income are important influences on health outcomes and access to services. In addition, education and literacy influence patients' ability to comprehend and adhere to medical instructions and to answer particular assessment items (Wolf, Gazmararian, & Baker, 2005).

TABLE R.3 Markers of Functional Status Associated With Increased Risk for Death or Decline

Functional Limitation	Instrumental Activities of Daily Living	Basic Activities of Daily Living
Difficulty With Physical Function, Including:	Difficulty or Needing Help With:	Difficulty or needing help with:
Doing heavy work around the house	Using telephone	Bathing
Walking 1/2 mile	Preparing meals	Walking across room
Climbing one flight of stairs	Maintaining house	Toileting
Standing for long periods	Taking own medications	Dressing
Lifting or carrying weights of 10 lbs	Shopping for personal needs	Continence
Using hands or fingers	Doing laundry	Grooming/hygiene
Pulling or pushing large objects	Managing finances	Transferring
Stooping, bending, or kneeling	Driving car or using bus/taxi	Feeding
Reaching with either or both arms		
Picking up an object from the floor		
Rising from chair		
Standing on one foot		

Group II: Functional Status

Many widely accepted health models emphasize function over disease and define important disability as the functioning of individuals within their environment (Verbrugge & Jette, 1994; http://www.nia.nih.gov/). Table R.3 lists markers of functional status associated with increased risk for functional decline, institutionalization, and death. Table R.3 lists three general groups of functional status measures: physical function or functional limitation, instrumental activities of daily living (IADL), and basic activities of daily living (BADL). Whereas many of the markers of physical function are self-reported, the direct assessment of functional limitations can be an important and simple part of the geriatric physical examination. Mobility and ability to rise from a chair unaided can be quickly observed and high-risk individuals can be identified at an early point on the trajectory of decline. IADL and BADL represent tasks important to independent living and self-maintenance. Although concerns have been raised about their applicability across gender groups, these items have been shown to have equal relationships to disability for both men and women (Saliba, Orlando, Wenger, Hays, & Rubenstein, 2000). For the individual patient, it is particularly important that the majority of persons with IADL or BADL limitations will remain stable over 2 years, and a significant percentage will evidence a decrease in the number of dependencies on follow-up questioning.

Group III: Health Behaviors

Tobacco use strongly influences health and ability to recover from injury or illness. Knowledge of an individual's level of alcohol use is important and improves quality because of the potential interaction of alcohol with many medications. The importance of physical activity and diet in prognosis and improvement are clearly recognized. Poor health practices (e.g., tobacco use, lack of regular exercise) not only contribute to the development of many conditions but also affect condition management and can be independent risk factors for functional decline or death.

Group IV: Diagnoses, Conditions, and Associated Treatments

Medical conditions and syndromes that are important risk factors for functional decline, institutionalization, and death include asthma, arthritis, cancer, cerebrovascular disease or stroke, chronic

TABLE R.4 Vulnerable Elder = Increased Risk for Death or Decline Over Next 2 Years

Measured by VES-13 score	
Age	
75–84	+1
85+	+3
Self-Rated Health	
Fair or poor	+1
Physical Function Limitation*	
If 1 limitation	+1
If 2 or more limitations	+2
Functional disability**	
Need help or unable to do any of 5 IADL/ADL activities	+4

Vulnerable elder = total points 3 or higher

***Physical Function Limitation**

A lot of difficulty with or unable to do:

a. stooping, crouching, or kneeling
b. lifting or carrying objects as heavy as 10 lbs
c. reaching or extending arms above shoulder level
d. writing or handling and grasping small objects
e. walking a quarter-mile
f. heavy housework such as scrubbing floors or washing windows

****Functional disability**

Receive help or don't do because of health:

a. shopping for personal items (e.g., toilet items or medicines)
b. managing money (e.g., keeping track of expenses or paying bills)
c. walking across the room (use of cane or walker is OK)
d. bathing or showering
e. doing light housework (e.g., washing dishes, straightening up, or light cleaning)

obstructive pulmonary disease, cognitive impairment, cardiovascular disease (e.g., myocardial infarction, heart failure, valvular heart disease, and hypertension), depression and other psychiatric diagnoses, diabetes mellitus, falls, hip fracture, malnutrition, inadequate exercise, and sensory (i.e., vision or hearing) impairment (Struck et al., 1999). Clinical risk assessment and intervention require consideration of the severity of each condition, the interaction of conditions, and the impact on the individual. Several of these diagnoses and conditions are underdetected across clinical settings and can be screened for in interdisciplinary team activities. These underdetected conditions that place elders at risk for decline include cognitive impairment, depression, pain, delirium, and falls. These conditions and geriatric syndromes are addressed in other entries.

Challenges in Risk Assessment

The list of potential risk factors is considerable and presents potential measurement challenge for providers and patients. Researchers and providers have tried to identify simple screening approaches that might identify older adults who are most at risk and most likely to benefit from more detailed risk assessment. On a population basis, a simple count of conditions, or a weighted summary of conditions, provides overall risk assessment. In addition, symptom summaries, medication class or type, and medication count may serve as measures of risk because they may reflect illness severity, iatrogenic risk, and/or quality of medical care. Summaries of the use of other medical services (e.g., number of physician office visits, number of prior hospitalizations, past use of any institutional services) may identify persons at increased risk for future utilization and decline.

An individual's global rating of his or her own health as "fair" or "poor" is a strong and consistent risk factor for future functional decline or death. Self-rated health may be so effective because of its ability to capture unmeasured disease severity, unmeasured functional impairment, and difficult-to-measure factors such as self-efficacy or locus of control.

Formal risk-assessment tools vary in the number of items included, the domains covered, and the outcomes assessed. Some are disease-specific, some predict utilization, and others predict the need for selected services. One such tool is the Vulnerable Elders 13-item Survey (VES-13) (Saliba et al., 2001). The VES-13 was developed as a parsimonious approach to identifying older adults at significant risk for health decline in order to allow better targeting of evaluations and care. Its 13 items address age, physical function, self-rated health, and IADL/BADLs. The items and scoring are shown in Table R.4. Any member of the interdisciplinary team can administer the VES-13 in person or over the telephone in fewer than 5 minutes. The VES-13 is being used in several health care systems to screen for and identify elders warranting referral for more comprehensive geriatric assessment (CGA).

Once an individual is classified as increased risk using a brief screener such as the VES-13, the breadth of factors that can place an individual at risk underscores the importance of tailoring interventions based on assessments of individual risk. If an individual is identified as needing CGA, an interdisciplinary-team approach is particularly well suited, efficient, and cost-effective for assessing, identifying, and integrating the multiple factors needed for this more thorough risk assessment.

Debra Saliba

See also

Measurement

Multidimensional Functional Assessment: Instruments, Overview

Internet Resource

National Institute on Aging

http://www.nia.nih.gov

REFERENCES

Saliba, D., Elliott, M., Rubenstein, L. Z., Solomon, D. H., Wong, L., Keesey, J., et al. (2001). The vulnerable elders survey (VES-13): A tool for identifying vulnerable elders in the community. *Journal of the American Geriatrics Society*, *49*(12), 1691–1699.

Saliba, D., Orlando, M., Wenger, N., Hays, R., & Rubenstein, L. Z. (2000). Identifying a short functional disability screen for older persons. *Journal of Gerontology*, *55A*(12), M750–756.

Struck, A. E., Walthert, J. M., Nikolaus, T., Beula, C. J., Hohman, C., & Beck, J. C. (1999). Risk factors for functional status decline in community-living elderly people: A systematic literature review. *Social Science Medicine*, *48*(4), 445–469.

Verbrugge, L. M., & Jette, A. M. (1994). The disablement process. *Social Science Medicine*, *38*(1), 1–14.

Wolf, M. S., Gazmararian, J. A., & Baker, D. W. (2005). Health literacy and functional health status among older adults. *Archives of Internal Medicine*, *165*(17), 1946–1952.

RURAL ELDERLY

Half of the total world's population lives in rural areas. In the United States, the median age of the U.S, rural population increased from 32.9 to 35.3 between 1990 and 2000, with the fastest growing group of elderly in all parts of the United States older than the age of 85. This number is expected to double by 2050 (http://www.nal.usda.gov/ric/ricpubs/what_is_rural.htm#INT).

Rural areas boast many positive advantages. Generations of rural dwellers have produced descendants who are resilient, adaptive, and strong. The rigors of creating and maintaining a livable and viable environment amid many stressors and challenges has prepared elders to meet new ones and thrive. Farming communities are especially closeknit and, other than lack of personal anonymity, provide support in times of trouble.

Rural areas attract new people who wish to raise their children in low-key/low-crime areas or retire from more stressful urban surroundings. There are growing mining/natural resource industries and increasing tourism. However, the number of nonfarming families (90%) continues to rise as corporate farming replaces family farms. This creates defunct townships, "bust and boom" cycles, and underdeveloped infrastructures for highly technical jobs. These conditions make difficult barriers to future job and economic development.

Defining Rural

There has been a continuing lack of consistency in definitions of what is "rural" among policy makers and researchers. Differentiation between urban/rural or metropolitan/nonmetropolitan areas in the United States has often been dichotomously defined. Federal and state statutes often require the use of metropolitan-area designations to allocate funds, set standards, and implement programs. In determining the economic and political ramifications of the statutes enacted, the use of these designations has failed to describe adequately the distinctive aspects of rural populations and their health needs (Zelarney & Ciarlo, 2000).

More recently, the U.S. Department of Agriculture (USDA) has developed a new rural–urban continuum to describe a more diverse "population density" definition of urban and rural populations. In 2003, The U.S. Office of Management and Budget issued new criteria for the definitions of metropolitan areas, and the Census Bureau modified the way it measures rural and urban areas. As a result, the rural population declined from 62 million to 59 million (ERS, 2006; USDA, 2006), adding about 5 million to the urban population. This type of statistical deemphasis on rural and frontier areas adds to the disincentive to fund and operate programs designed on new rural rather than older urban models.

There is wide agreement that rural populations, regardless of how they are defined, have distinctive characteristics that create differences in their susceptibility to health problems and overall health status. Major health problems differ across geographic regions but there are similarities among rural elderly that apply in all areas. Chronic diseases (e.g., diabetes, pulmonary, cardiac, orthopedic, mental health) are often discovered and treated late, ultimately resulting in aged persons with well-advanced health problems. Lack of access to appropriate available health and social services, lack of public transportation, long travel distances to specialty and acute care services, and a low percentage of adequate insurance contribute significantly to negative health status in rural elderly (Miller, Clarke, Albrecht, & Farmer, 1996; http://www.nal.usda.gov/ric/ricpubs/what_is_rural.htm#INT). As the percentage of elderly rural people steadily increases, culturally sound health care solutions need to be found.

It is well known that rural areas suffer from lack of preventive services. A special report paralleling *Healthy People 2010,* entitled *Rural Healthy People 2010* (Gamm, Hutchison, Dabney, & Dorsey, 2003) addresses the status of health promotion and disease prevention in rural America. Farm-machinery accidents, motor vehicle injuries, poor obstetrical care, and chronic problems of alcohol and drug abuse with related family problems and violence are among the common preventive health issues. Rural communities comprise one half of the health professional shortage areas (U.S. Department of Health and Human Services, 2003). With approximately 20% of the U.S. population living in rural areas, less than 10% of physicians have practices there. Advanced practice nurses and physician assistants have more recently added many primary preventive care services, but maldistribution of providers remains a particularly vexing rural problem.

Poverty

There are extremes of wealth and poverty among rural and frontier dwellers and, thus, the elderly. In general, farming communities have higher incomes as do mining industrial areas than nonfarming areas. Geographic differences also exist. Differential resource distribution helps determine differential courses of action in rural communities on both an individual and a community level.

Poverty is a common issue among many rural families. Recent laws related to welfare and Medicare reform have had an unusually severe effect on rural health, especially women (Coward, et al., 2006). Rural women have less formal education, lower wages, fewer job opportunities, and statistically more female-headed households with higher poverty rates than either rural males or their female urban counterparts. Although the actual number of homeless people in rural America is unknown, it is estimated that one of five homeless persons live in rural areas.

Elderly women outnumber men and live longer with more chronic diseases. During their lifetime, they engage in both traditional female roles as they add responsibilities related to family businesses. They experience role overload that can include heavy physical labor. They are likely to be victims of domestic violence (Krishnan, Hillbert, & Pase, 2001).

Elderly rural men and women living in poverty have more disabilities and, consequently, are less likely to be employed. The nature of work in many rural areas is more physically demanding and puts them at risk for serious physical injuries. Throughout their lifetime, they are likely to be without insurance and have less access to formal homecare and rehabilitative services. The main burden of care of the disabled and frail elderly falls on female informal caregivers. Elderly rural men share many of the same issues of health as women. Additionally, retirement or job loss with stigmatization and few alternative opportunities brings with it a higher incidence of suicide and depression, resulting in major addictions, a history of alcoholism, and frequent self-inflicted deaths. Mental health services in very rural areas are woefully absent and providers specializing in geriatric mental health nearly nonexistent. In several frontier states, most counties are designated Mental Health Shortage Areas. The most severe barriers to accessing those services that do exist are cost and availability of services.

Solutions

Recent policy initiatives and innovative programming have helped rural elderly,, including technology; collaborative approaches among communities, states, and providers; increased resources; and educational initiatives to educate the public and professionals of the issues and needs.

Technology and Communication

Advances in technology and communications are positively affecting rural elderly. People in U.S. rural communities now view the connectivity of high-volume telephone lines and access to the Internet as necessary rather than merely desirable (Zelarney & Ciarlo, 2000). Telecommunication is partially relieving the rural isolation that places rural elderly in particular jeopardy, pushing community efforts to upgrade and advance lagging electronic connectivity. Delivery of health service through technology helps to delete the distance, isolation, and lack of services available in rural areas. Telehealth, especially in specialty and mental health areas, has changed both access and quality of services in many rural and frontier areas. Reimbursement for telehealth services has recently increased, and many interstate professional issues are in the process of being resolved. The use of home monitoring has increased contact of chronically ill elders with providers. Rural families and communities now have new and better means of communication and knowledge about health through the Internet. The rural elderly and their providers increasingly depend on the community to build and maintain the infrastructure to underpin new growth and find the resources they need (Coward, et al., 2006).

Collaborative Approaches

Key to the care of elders is collaboration and interdisciplinary planning among local, state, and federal entities. Coupled with telecommunications, models of collaboration have been developed in rural areas. An example for both increased teleconnectivity and collaboration is the Inland Northwest Health Services (INHS) project in Spokane, Washington. Recognizing the reasons for hospital closures, low operating margins, and redundant services, Empire Health Services and Providence Services of Eastern Washington joined together to form a 501(c) nonprofit organization. The chief goals were to reduce duplication and improve quality of services to the community in the northeast region of the state of Washington. Sharing electronic records, regionalizing transport services to improve access, and using telecommunications to increase access to specialist services demonstrated the need for and success of regional telehealth educational outreach for providers. After many years, INHS represents a large, functional, and financially competitive group of hospitals and services that serves as a collaborative model for other rural areas (Hasnain-Wynia, Margolin, & Bazzoli, 2001).

Training and University Involvement

Rural communities and universities need to be the leaders in interdisciplinary and collaborative initiatives to build and strengthen services for the rural elderly. They can and should work within rural communities to maximize their resources, design newer approaches to care, and implement applied research programs

Universities are implementing more rural placements for students, creating initiatives to bring continuing education and health education to providers and rural residents, and partnering with states and communities to gather health data and disseminate it to agencies and communities for policy-making decisions and program planning.

Increased Resources

Available and appropriate financial resources are paramount to changes in rural health at the federal, state, and local levels. However, the most innovative solutions come from the communities in which the problems are encountered. With some resources already in place, communities need to assess and strategically place additional financial resources and to support needed services. Rural elderly need basic preventive, communicative, and supportive services. It is imperative that this is understood at appropriation and policy levels to maximize use of additional funds.

Rural elderly are a diverse population. In an attempt to address racial and ethnic disparity in health care, the U.S. Department of Health and Human Services created a program in the late 1990s that would fund research in this area (http://www.cdc.gov/nccdphp/publications/aag/reach.htm). Among targeted health problems were diabetes, cardiac disease, and breast and cervical cancer, diseases found in excess among elderly in general and rural racial/ethnic groups in particular. This program has successfully produced many useful research projects, coalitions, and programs to address discovered needs.

The field of gerontology is growing steadily and, with it, more research and knowledge about the rural elderly becomes available. The direction of future programming in rural areas depends on us using this wisely to enhance the life of the elderly and the communities in which they live.

FAY W. WHITNEY

See also

Caregiver Burden
Caregiver Burnout
Poverty
Transportation

Internet Resources

Economic Research Service; U.S. Department of Agriculture
http://www.ers.usda.gov/briefing/Population/older

Rural Information Service
http://www.nal.usda.gov/ric/richs/stats/hltm

USDA National Agricultural Library Rural Information Center

http://www.nal.usda.gov/ric/ricpubs/what_is_rural.htm

Frontier Mental Health Resource Network
http://www.wiche.edu/MentalHealth/Frontier/letter2.html

The Centers for Disease Control and Prevention (CDC)
http://www.cdc.gov/reach2010/

REFERENCES

Coward, R. T., Davis, L. A., Gold, C. H., Smiciklas-Wright, H., Thorndyke, L. E., & Vondracek (Eds.) (2006). *Rural women's health: Mental, behavioral and physical issues*. New York: Springer Publishing Company.

Gamm, L. D., Hutchison, L. L., Dabney, B. J., & Dorsey, A. (2003). *Rural healthy people 2010: A companion document to healthy people 2010*. College Station, TX: Texas A&M University System Health Sciences

Center, School of Rural Public Health, Southwest Rural Health Research Center.

Hasnain-Wynia, R., Margolin, F. S., & Baxxoli, G. J. (2001). Models for community health partnerships. *Health Forum Journal*, *44*(3), 29–33.

Krishnan, S. P., Hillbert, J. C., & Pase, M. (2001). An examination in intimate partner violence in rural communities: Results from a hospital emergency department study from Southwest United States. *Family and Community Health*, *24*(1), 1–14.

Miller, M. K., Clarke, L. L., Albrecht, S. L., & Farmer, F. L. (1996). The interactive effects of race and ethnicity and mother's residence on the adequacy of prenatal care. *The Journal of Rural Health*, *12*(1), 6–18.

U.S. Department of Health and Human Services (2003). *Health profession shortage areas*. Bureau of Health Professions, HRSA. Available at http://bhpr.hrsa.gov/shortage

Zelarney, P.T., & Ciarlo, J. A. (2000). *Defining and Describing Frontier Areas in the United States: An Update, Letter to the Field No. 22*. Boulder, CO: Frontier Mental Health Services Resource Network.

S

SATISFACTION MEASUREMENT

Patient satisfaction is widely measured but poorly understood. It is measured with a variety of instruments and methods, with little agreement or consistency regarding how to interpret findings, how to utilize them, or even what it is that is being measured. Yet hospitals, health systems, nursing homes, home-health agencies, and other providers of health and health-related services devote considerable resources to collecting and analyzing patient-satisfaction data. Why?

Payers, accrediting agencies, policy makers, and consumers demand increasing levels of accountability for quality of care and a move toward more patient-centered care. Quality, of course, can be defined and measured in various ways, including methods that focus on clinical and functional outcomes. Measuring patients' own perceptions, evaluation, and opinions of their care is widely seen as an important aspect of assessing quality of care. At the very least, devoting resources to soliciting patient reports or assessments of care communicates some level of recognition of the importance of the patients' voice in evaluating quality of care (Rosenthal & Shannon, 1977). Of course, without some kind of plan for analyzing and utilizing satisfaction data, such efforts may be primarily symbolic.

Providers utilize a number of different types of tools to measure satisfaction. (Castle, Brown, Hepner, & Hays, 2005). Surveys are most common; they provide a means of gathering and analyzing data relatively quickly, efficiently, and inexpensively when compared to other methods such as focus groups. Focus groups, however, can provide a good basis for more in-depth examination of patients' and family members' perceptions and opinions, as well as for developing or revising survey instruments. Survey instruments include those supplied by commercial vendors, often adapted to providers' specific needs or interests. Some providers develop their own instruments. Patients who have received short-term or episodic services (e.g., acute hospital care, post-acute home-health, or skilled-nursing facility services) are typically surveyed (by telephone or by mail) following discharge. This may be more difficult when assessing recipients of long-term-care services (e.g., nursing-home care, long-term personal-care services).

A typical patient satisfaction survey includes one or more general questions regarding the overall quality of care, often involving choices along a Likert-type scale. In addition, the survey instrument usually includes questions regarding specific services (e.g., nursing, therapy) and may also include questions regarding specific elements of care such as the quality of communications with staff, timeliness, and other interpersonal aspects of care.

Patient satisfaction scores are typically high. It is not unusual for upwards of 90% of respondents to rate their care as "excellent" or "very good" or to rate themselves as "very satisfied" or "satisfied" with their care. This does not necessarily preclude efforts to analyze and understand variance within those scores or to focus on outliers as a signal to investigate possible quality problems. For instance, if a home-health agency's satisfaction surveys typically yield high scores but one team or field office is showing consistently lower scores, it will most likely be useful to find out why—even if it turns out that the reasons for these lower scores do not reflect a quality problem.

Patient satisfaction rates are often used as a marketing tool. When a hospital or health plan boasts that 93% of its patients rated their care or services as "very good" or "excellent," while its competitors in the same market have similar or higher rates, this approach to utilizing patient-satisfaction data may be viewed as disingenuous. On the other hand, satisfaction rates and trends may provide useful information on patient (and family) loyalty and on any specific services or attributes of care that a provider may choose to emphasize in its marketing efforts.

In addition, some payers link payment levels to patient satisfaction as part of their implementation of pay-for-performance mechanisms. In some organizations and systems, satisfaction scores may figure into evaluation of individual providers, teams, or services. Whether and how these practices can be employed productively is open to question because patient satisfaction may reflect factors that are not under the control of individual providers.

Because there is a variety of instruments and methods used for measuring satisfaction, it is often difficult to utilize satisfaction data to study patient perceptions and opinions beyond the level of an individual provider or system. One advantage of working with a commercial vendor is the ability to obtain benchmarking data—that is, to examine how a provider's performance compares to other organizations that work with the same vendor.

Measuring satisfaction among older populations poses some specific challenges. First, many instruments are based on those that have been developed to measure satisfaction with acute hospital services and may be poorly adapted to measuring satisfaction with longer-term settings and services. Older patients' needs often include a mix of medical, personal care, and social service needs that may not be captured by satisfaction instruments originally designed to measure satisfaction with acute health care services. Second, surveying individuals who are current recipients of services (as may be necessary in evaluating long-term care) may introduce a source of bias because current patients—particularly frail, elderly, or otherwise vulnerable individuals—may feel intimidated from providing critical responses. Third, family members often serve as proxy respondents for older patients.

There have been some efforts to develop satisfaction measures that focus on the needs of patients who are receiving one or another type of long-term services. Nursing-home resident satisfaction surveys have been developed by commercial vendors and by some state agencies. The Home Care Satisfaction Measure (HCSM) (Geron et al., 2000) measures satisfaction of long-term home-care services.

In the past several years, a new approach has been developed to measuring patients' experiences of their care. The Consumer Assessment of Health Providers and Systems (CAHPS) is a series of tools that have been developed with the purpose of collecting and analyzing information on patient experiences of care, using report-type questions (Cleary, 1999. CAHPS has been developed with the support of the U.S. Agency for Healthcare Research and Quality (AHRQ, n.d.), which explains that "CAHPS surveys are similar to patient satisfaction surveys but not the same. Like a satisfaction survey, CAHPS surveys include ratings of providers and health plans (e.g., rating of personal doctor, rating of health plan). But they go beyond this type of question by asking patients and consumers to report on their experiences with health-care services. Reports about care are regarded as more specific, actionable, understandable, and objective than general ratings alone." (AHRQ, n.d.).

CAHPS was originally developed to measure patient experiences with health plans but has since broadened in focus, and several CAHPS instruments have been developed to examine patient experience with different types of service providers. A Hospital CAHPS (H-CAHPS) is scheduled by the Center for Medicare and Medicaid Services to be implemented nationally in 2007. Results will be available to the public through the Hospital Compare Web site maintained by the U.S. Department of Health & Human Services. Two Nursing Home CAHPS instruments—one for patients and one for family members—are currently being developed. Among other things, the broad use of a standardized approach to measure patient experiences of care (and a standard instrument) will allow for wider use of benchmarking than is currently possible with patient-satisfaction surveys.

Whether CAHPS' approach to measuring patient experiences of care will entirely replace "traditional" patient-satisfaction measurement remains to be seen. The development of CAHPS has added a degree of scientific rigor and standardization to assessing patient experiences, and its continually wider use will yield important information regarding its promise and limitations. An important consideration is whether the CAHPS approach can and will be adapted to take into account the broad array of services and needs presented by older patients.

DAVID KEEPNEWS

See also
Quality of Life Assessment

Internet Resources

Consumer Assessment of Health Providers and Systems
http://www.cahps.ahrq.gov

Hospital CAHPS
http://www.hcahpsonline.org/

Hospital Compare
http://www.hospitalcompare.hhs.gov/

National Quality Measures Clearinghouse
http://www.qualitymeasures.ahrq.gov

REFERENCES

Agency for Healthcare Research and Quality (n.d.). CAHPS Principles. Available at http://www.cahps.ahrq.gov/content/cahpsOverview/OVER_Principles.asp?p=101&s=13

Castle, N. G., Brown, J., Hepner, K. A., & Hays, R. D. (2005). Review of the literature on survey instruments used to collect data on hospital patients' perceptions of care. *Health Services Research*, *40*(6) 1996–2017.

Cleary, P. D. (1999). The increasing importance of patient surveys. *British Medical Journal*, *319*, 720–721.

Geron, S. M., Smith, K., Tennstedt, S., Jette, A., Chassler, D., & Kasten, L. (2000). The home care satisfaction measure: A client-centered approach to assessing the satisfaction of frail older adults with home care services. *Journal of Gerontology, Series B: Psychological Sciences and Social Sciences*, *55*, S259–S270.

Rosenthal, G. E., & Shannon, S. E. (1997). The use of patient perceptions in the evaluation of healthcare delivery systems. *Medical Care*, *35*, NS58–NS68.

SELF-NEGLECT

Self-neglect in older adults is a complex spectrum of behaviors characterized by inattention to health and hygiene. It generally stems from an inability or unwillingness to access much-needed services. It is a daunting, poorly studied topic, traditionally categorized under the umbrella of elder mistreatment. However, the lack of a perpetrator (other than the "self") and the heterogeneity of the syndrome have been barriers to a universal definition, research, and practice frameworks.

The phenomenon of self-neglect is an increasingly common problem, with a reported prevalence of 5% to 6% among community-dwelling older adults based on referrals to Adult Protective Services (APS), the state agencies charged with advocacy for vulnerable adults. This is believed to be a gross underestimation because it is only the most extreme cases that are referred to APS. The vast majority of cases inundate community-based social service agencies. Nevertheless, it is the most common cause of referrals to APS, comprising as much as 80% of such referrals (Lachs, Williams, O'Brien, Hurst, & Horwitz, 1996).

Self-neglect has a variety of synonyms in the literature, including Diogenes syndrome, aged or senile recluse, squalor syndrome, and social or senile breakdown of the elderly. It is typically characterized by extreme lack of self-care, inattention to hygiene, domestic squalor, syllogomania (i.e., hoarding), apathy and "lack of shame" for their condition, social withdrawal, and stubborn refusal of help (Clark, 1975). Despite knowing its various components, there is no widely accepted standardized definition, but rather vague and often judgment-ridden ones, which pose barriers to uniform identification of self-neglecters, both in terms of research and clinical practice. Self-neglect was excluded from the formal definition of elder abuse and neglect of the National Academy of Sciences (Bonnie & Wallace, 2002) due to its controversial categorization, and only 29 states define self-neglect in statutes pertaining to APS. Furthermore, each state has adopted its own version of a definition, resulting in a lack of consensus even among similar government agencies.

Extracting the most objective and least judgmental elements from the existing definitions, and bearing in mind that self-neglect is a spectrum with varying severity, self-neglect may be operationalized as an older adult who exhibits one or more of the following: (1) inattention to personal or environmental hygiene, (2) refusal of one or more services, and/or (3) endangerment due to one's behavior. However, at the same time, one should bear in mind that personal habits perceived by others as self-neglect may be consistent with values important to the person, and that there is enormous variability within and between different societies and cultures, as well as between individuals within a society, on what constitutes proper personal health and hygiene. In addition, one should not forget that unhealthy lifestyle choices that may have gone unnoticed in one's younger life may take a toll on the older adult.

The profile of a self-neglecter that comes to mind based on published case reports is of an older adult who has never married, with normal cognitive status and of above average intelligence, with premorbid personality traits, poor personal hygiene, poorly groomed, dressed in shabby clothes, with often matted hair and long toenails, poor dental hygiene and nonhealing ulcers, inadequate nutritional status, living in a dirty environment with either limited furniture or overly cluttered, or in unsafe or unsanitary conditions. They are nonconsenting adults, who avoid any health or social services, so they are a difficult population to find and serve.

Both the complexity of the syndrome and the lack of standardization in the field make even basic epidemiological studies difficult to conduct. Therefore, there has been little advancement in our understanding of the risk factors for self-neglect and, consequently, in the development of effective management and prevention strategies in the last 5 decades, since the first descriptions of the syndrome appeared. However, there are a few well-designed prospective studies that shed some light. Based on a recent extensive review of the medical literature (Pavlou & Lachs, 2006), a variety of factors was identified evidencing the multifactorial etiology of the syndrome. There are a multitude of medical, psychiatric, functional, and social impairments described, and their accumulation seems to result in self-neglect. Among them are medical co-morbidity (e.g., congestive heart failure, stroke, malnutrition, incontinence, Parkinson's disease), motor and sensory impairments, psychiatric co-morbidity (e.g., executive dysfunction, dementia, depression, schizophrenia, obsessive-compulsive disorder, personality disorders, anxiety, phobias), poverty, low education, adverse life events, and social isolation. A prospective study of more than 2,800 older adults from the New Haven EPESE cohort, with 9-year follow-up, found that self-neglecters were 2.38 times more likely to suffer from depression and 4.24 times more likely to have dementia, compared to controls (Abrams, Lachs, McAvay, Keohane, & Bruce, 2002; Lachs, Williams, O'Brien, & Pillemer, 2002). Similar studies of the same large cohort revealed the high morbidity and mortality associated with self-neglect: 70% of self-neglecters were placed in a nursing home (5.23 times more likely than controls) (Lachs et al., 2002), and self-neglecters had an overall two-fold increased risk of death after controlling for other factors including co-morbidity (Lachs et al., 1996). Smaller studies have reported a 50% mortality rate among self-neglecters placed in nursing homes.

Evaluation of the self-neglecter should include a global assessment of the individual, also known as a geriatric assessment. The approach should be similar to that for a geriatric syndrome because self-neglect resembles a geriatric syndrome (i.e., multifactorial etiology, shares risk factors with other geriatric syndromes, and associated with increased morbidity and mortality). An interdisciplinary team should be assembled to help with the evaluation, as well as the subsequent design and implementation of tailored interventions, on a case-by-case basis. Medical, psychiatric, functional, and social domains should be assessed, with particular attention given to the belief system, values of the individual, reasons for lifestyle choices, and general outlook of life, which may explain their behavior. The answer to the "why" question may be the key that unlocks communication channels and enables negotiation and collaboration with the self-neglecter. A global history, query into cultural and religious preferences, looking into both host and environmental domains (e.g., assessing for sensory or functional impairments, medical or psychiatric problems, health literacy, social networks, resources, housing, transportation) is invaluable information to obtain. A geriatric assessment carefully identifies the individual's needs and helps in the design of necessary interventions.

A variety of attitudes toward self-neglecters can be helpful. First and foremost should be establishing rapport and building trust with the client or patient, which may be lengthy and time-consuming but invaluable. A balance should be achieved between respect for the client's autonomy and the practitioner's desire to help and protect, as well as a balance between the rights of the individual and those of the surrounding community. If the individual refuses the offered help, capacity to make such decisions should be evaluated. In case of lack of decision-making capacity, with no available health-care proxy or surrogate to make such decisions, guardianship should be sought to enable placement in a supervised environment, such as an assisted-living facility, adult day-care program, home-care services, or nursing home. These are not necessarily effective options for most cases but, unfortunately, they are the only available options at present, pending further research.

Cases become more challenging to tackle if self-neglecters have decision-making capacity and continue to refuse much-needed services. Oftentimes in these cases, health and social service providers need to compromise their agenda and their eagerness to help. For example, taking insulin for diabetes is more important than continuing a multivitamin, and if the self-neglecter will only agree to a single medication, the health-practitioner may have to make that compromise. Similarly, if the client refuses home-care services and continues to ignore his or her health, hygiene, and environment, it may be that ensuring adequate nutrition through a Meals On Wheels program is more important than bathing or keeping a clean home. An attempt to discover the purpose of the behavior should be made, as well as to involve the individual in the decision-making process (if with capacity) for more effective and long-lasting results.

As far as concrete interventions, several are routinely employed, despite the lack of evidence for their effectiveness. Home-care and adult day-care services are two of the more benign options, which may have a significant positive impact on the life of self-neglecters if they agree to them. The rest of the options are less propitious and involve referral to APS, guardianship proceedings, hospital admission for safety, and eventually nursing-home placement. Beyond these, the practitioner can only assure public safety, provide nonjudgmental support, and try to earn the self-neglecter's trust patiently, in little ways.

In conclusion, despite the fact that there is no standard definition of self-neglect, a global assessment of the patient/client with the help of an interdisciplinary team identifies the multiple factors in need of interventions. Working as part of an interdisciplinary team offers a synergism, which not only makes these tasks less daunting but also provides a better chance of success and a lasting positive effect. Clearly, more basic epidemiological research is warranted in this field to identify modifiable risk factors, develop instruments to identify and measure self-neglect, and develop and test interventions in longitudinal studies to better serve this heterogeneous, currently puzzling population.

MARIA P. PAVLOU

See also

Adult Protective Services
Elder Mistreatment: Overview
Elder Neglect
Financial Abuse
Institutional Mistreatment: Abuse and Neglect
Personality Disorders in the Elderly

Internet Resources

National Center on Elder Abuse
http://www.elderabusecenter.org

Public Health Agency of Canada
http://www.phac-aspc.gc.ca/ncfv-cnivf/familyviolence/html/age_snegl_e.html

REFERENCES

Abrams, R. C., Lachs, M., McAvay, G., Keohane, D. J., & Bruce, M. L. (2002). Predictors of self-neglect in community-dwelling elders. *American Journal of Psychiatry*, *159*, 1724–1730.

Bonnie, R. J., & Wallace, R. B. (Eds.) (2002). *Elder mistreatment: Abuse, neglect, and exploitation in an aging America*. Washington, DC: The National Academies Press, p. 40.

Clark, A. N. (1975). The Diogenes syndrome. *Nursing Times*, *71*, 800–802.

Lachs, M. S., Williams, C. S., O'Brien, S., Hurst, L., & Horwitz, R. (1996). Older adults: An 11-year longitudinal study of adult protective service use. *Archives of Internal Medicine*, *156*, 449–453.

Lachs, M. S., Williams, C. S., O'Brien, S., & Pillemer, K. A. (2002). Adult protective service use and nursing home placement. *Gerontologist*, *42*, 734–739.

Pavlou, M., & Lachs, M. S. (2006). Could self-neglect in older adults be a geriatric syndrome? *Journal of the American Geriatrics Society*, *54*(5), 831–842.

SELF-RATED HEALTH

Global self-ratings of health are the responses to the single question, "How would you rate your health?" The usual response categories are excellent, very good, good, fair, or poor. This question is often used to open a series of more specific questions relating to health in epidemiological surveys, or it may be the only measure of health status in an employment or opinion survey. For these reasons, it appears in many contexts and is therefore familiar and easy for respondents to answer. There are a large number of variants of the item, some of which include a specific age comparison ("Compared to other people your age, how would you rate your health?"), but all of them appear to tap similar content (Bjorner, Fayers, & Idler, 2005). Because the question is so widely used, and because it has proven to provide valuable information on the health status of populations, particularly elderly populations, it has been the focus of a large and still growing body of research that goes back to the 1950s.

Self-ratings or self-assessments of health have been a particularly powerful research tool in elderly populations. Early research in the Duke Studies of Normal Aging compared elderly respondents' self-ratings to physician ratings for the same individuals, finding that older individuals often tended to be more optimistic about their health than physicians were, and also that self-ratings were good predictors of future health (Maddox and Douglass, 1973). Self-rated health is associated cross-sectionally with medical diagnoses, physical function, physical symptoms, pain, mental health, vital exhaustion, and possibly some biomarkers such as body mass index, total-to-HDL-cholesterol ratio, norepinephrine, and s-prolactin (Bjorner et al., 2005; Mäntyselkä, Turunen, Ahonen, & Kumpusalo, 2003). Given the higher burden of chronic illness in aging populations, poor and fair ratings increase in prevalence with age.

However, comparisons of self-ratings of health and physical health status among older and younger respondents find that older persons tend to rate their health more positively, relative to younger persons at any given level of health status. This difference could be due to an effect of aging and adjustment to chronic illness over time. Or it could be due to more stable cohort differences deriving from factors such as hardship or health disadvantage in early life. Or it could be due to selective survival of those with better self-ratings of health. Research shows support for all three explanations (Idler, 1993). Such research tends to dispel the stereotype of hypochondriasis among elderly persons; older persons are more likely to be underreporters of health complaints than overreporters.

Self-ratings of health are frequently used to track changes in population health over time or to make international comparisons. The National Center for Health Statistics has included the self-rated health question in its surveys, such as the National Health Interview Survey (NHIS) and the National Health and Nutrition Examination Survey (NHANES) for decades. Trends show that perceived health status among the older U.S. population has improved in the past 25 years. In 1982, 35.1% of the age-adjusted 65+ population rated their health as fair or poor; this has declined steadily to just 26.8% today (http://www.cdc.gov/nchs/). Similarly, the United Nations' World Health Organization

Global Study of Ageing and Adult Health (SAGE) uses self-ratings of health as a comparative indicator of population health; among the countries of India, China, Ghana, Mexico, Russia, and South Africa, Indian adults aged 60+ had the highest percentage reporting their health as fair/poor, and Mexicans had the lowest (http://www.who.int/healthinfo/systems/sage/en/index3.html).

The utility of self-ratings of health as an indicator of health status in populations was increased beginning in 1982 with a Canadian study that showed self-rated health to be a strong predictor of mortality during 7 years in a large sample of elderly persons. Males and females who rated their health as poor were three times as likely to die as those who rated their health as excellent, even when sociodemographic factors and Manitoba Health Services data on diagnoses, physician visits, hospitalizations, and self-reports of conditions were included in the analysis. Respondents who rated their health as fair and even good also had significantly higher risks of mortality compared with those who rated their health as excellent, even after adjustment for age, gender, and health status. Since this initial publication, there have been more than 70 such studies appearing in the international literature, almost all of which have had similar findings. The continuing outpouring of such studies is attributable to the frequency with which the self-rated health item is included in health surveys with longitudinal follow-up of mortality; these are, by their nature, secondary analyses of existing data with long follow-up periods. Well over half of these studies have employed samples of older persons (Benyamini & Idler, 1999; Idler & Benyamini, 1997). Thus, self-ratings of health have proven themselves a useful indicator of the present health status of populations and are also valid predictors of mortality during follow-up periods as long as 12 or more years.

More recent longitudinal studies have studied a range of other outcomes, including onset of coronary heart disease, withdrawal from the labor force (Bjorner et al., 2005), functional disability (Kaplan, Strawbridge, & Camacho et al., 1993), and health services utilization and expenditures (DeSalvo, Fan, McDonell, & Fihn, 2005). Another new direction for this research is the employment of self-ratings of health in clinical-care settings, for the purpose of assessing quality-of-life outcomes in specific patient groups (http://patienteducation.stanford.edu/research/generalhealth.html and http://www.sf-36.org/). A related area is the assessment of the quality of life of family caregivers who are coping with the needs of their cognitively or physically impaired elderly family members. An increasing body of research shows the health impact of caregiving and the need for assessments in which self-ratings of health of the caregivers themselves play a central role (http://www.caregiver.org/caregiver/jsp/home.jsp). It is likely that there will continue to be new applications and analyses of the concept of self-rated health as a single item, or embedded in multidimensional quality of life measurements, in representative population samples of elderly persons, in patient samples, and in caregiver samples.

Conclusion

Self-rated health is a widely used indicator of health status in cross-sectional population and clinical studies and a predictor of mortality and other health outcomes in longitudinal studies. It is strongly associated with more objective measures of health status, such as physical function, diagnoses, and use of health services, but it appears to incorporate additional information beyond these indicators. Self-rated health may represent a higher order of integration of all information available to the respondent, as well as their trajectory and perceived prognosis. Or it may represent a fundamental sense of health identity that underlies and colors new health events, that influences the reporting of symptoms, and that motivates health behaviors that result in measurable health outcomes. With its brevity and utility, it is likely to continue to stay in wide use in surveys and assessment instruments, which will in turn lead to further research.

Ellen Idler

See also

Measurement

Internet Resources

Family Caregiving Alliance
http://www.caregiver.org/caregiver/jsp/home.jsp

National Center for Health Statistics
http://www.cdc.gov/nchs/

sf-36.org
http://www.sf-36.org/

Stanford Patient Education Research Center
http://patienteducation.stanford.edu/research/generalhealth.html

Supercourse Public Health Lecture
www.publichealth.pitt.edu/supercourse/SupercoursePPT/3011-4001/3551.ppt

World Health Organization
http://www.who.int/healthinfo/systems/sage/en/index3.html

REFERENCES

Benyamini, Y., & Idler, E. (1999). Community studies reporting association between self-rated health and mortality: Additional studies, 1995–1998. *Research on Aging*, *21*, 392–401.

Bjorner, J. B., Fayers, P., & Idler, E. (2005). Self-rated health. In P. Fayers & R. Hays (Eds.), *Assessing quality of life in clinical trial* (2nd Ed., pp.309–323). New York: Oxford University Press..

DeSalvo, K. B., Fan, V. S., McDonell, M. B., & Fihn, S. D. (2005). Predicting mortality and healthcare utilization with a single question. *Health Services Research 40*, 1234–1246.

Idler, E. L. (1993). Age differences in self-assessments of health: Age changes, cohort differences, or survivorship? *Journal of Gerontology: Social Sciences*, *48*, S289–S300.

Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior*, *38*, 21–37.

Kaplan, G. A., Strawbridge, W. J., & Camacho, T. (1993). Factors associated with change in physical functioning in the elderly: A six-year prospective study. *Journal of Aging and Health*, *5*, 140–153.

Maddox, G., & Douglass, E. (1973). Self-assessment of health: A longitudinal study of elderly subjects. *Journal of Health and Social Behavior*, *14*, 87–93.

Mäntyselkä, P. T., Turunen, J. H. O., Ahonen, R. S., & Kumpusalo, E. A. (2003). Chronic pain and poor self-rated health. *Journal of the American Medical Association*, *290*, 2435–2442.

SENIOR CENTERS

Begun in the early 1940s, senior centers in the United States now number between 10,000 and 12,000. The large majority of elderly persons is aware of the existence and know the location of such centers, and studies indicate that between 15% and 20% of older persons participate in center activities. Many senior centers are multipurpose and provide a wide range of health, social, recreational, and educational services. The Older Americans Act (OAA) directs senior centers to serve as community focal points for comprehensive service coordination and delivery at the local level. Thus, senior centers not only provide services for older persons but also play important information and referral roles through linkages with a wide variety of other community organizations. Senior centers are often used by other agencies as delivery sites for programs such as congregate meals and health education (Krout, 1989, 1990).

Senior centers generally receive funding from a large number of sources, including the OAA, state and local government, fund-raising, and participant contributions. Larger senior centers generally have professional, paid staffs but also rely heavily on older persons as volunteers. Longitudinal data reveal that senior-center budgets and programming increased in the 1990s. The mean number of activities and services offered by centers in a national sample of centers studied in the mid-1990s was 11 and 18, respectively (Krout, 1990).

Nine of 10 centers offered information and referral, transportation, and congregate meal services, and 70% offered home-delivered meals. Three-quarters of the centers offered health screening and maintenance, health education, and nutrition education. Information and assistance services (e.g., consumer protection; housing; crime prevention; financial, tax, and legal aid; social security) were offered by around two-thirds of the centers (Krout, 1990). Unfortunately, more recent national data are not available.

The majority of research suggests that senior-center users generally have higher levels of health, social interaction, and life satisfaction and lower levels of income than do nonusers (Krout, 1983, 1990). However, throughout their history, senior centers have responded to the needs of frail and well older persons, with some centers developing a greater emphasis on one group or the other (Krout, 1995, 1996). Depending on the senior center and the geographic area in which it is located, considerable diversity is found in who attends a center; the number of programs it offers; and the size of its facility, staff, and resources. Centers in many big cities, as well as suburbs and even some rural areas, are facing challenges and opportunities associated with a growth in the number of elders from diverse ethnic backgrounds. High levels of immigration in the 1990s meant increasing numbers of older adults who do not speak English. Many user populations have "aged in place," and attendance for some center programs, such as congregate meals, has leveled off or declined.

Beginning as early as the 1980s, senior-center professionals began to realize that a new population of older adults would soon be emerging and that younger retirees had different activity interests than the population centers have traditionally served. This recognition grew in the 1990s and increasing attention has been given to preparing for the "baby boom" cohort's transition into older age. Many senior centers have responded to the changing interests and characteristics of the young-old with self-enhancement programs in art, computers, language, exercise and wellness, and financial planning, to name a few. As more older people have found themselves caring for even older parents, some senior centers have tackled issues of family caregiving. It is interesting that recent changes in federal policy and programs have provided new roles and visibility for senior centers. For example, the institution of Title VII under the OAA has resulted in small amounts of funding for senior centers to provide resources and education to caregivers of older persons. Senior centers are also playing a prominent role in providing information to older adults and their family members on enrollment in Medicare's new Part D prescription-drug program. Although the extent of dollars going to senior centers in these two areas is unknown, it is clear that these programs have provided opportunities for centers to serve people who otherwise would not have contacted them. Overall, senior centers have had varied success in attracting newly retired individuals to their programs and they face increasing competition from other service providers, especially for-profit businesses, and as the interests and activity patterns of older adults change. A recently published book by Beisgen and Kraitchman (2003) provides information on a wide range of needs of older adults and specific suggestions on how senior centers can develop and manage programs to meet them.

Despite their prevalence and 60-year history, senior centers have largely been ignored by gerontological researchers. There is insufficient data on center utilization patterns, management, or program content and evaluation. Longitudinal and trend data, other than counts of congregate-meal participants, are lacking. This lack of data has not kept senior-center advocates from working to strengthen center management and programming. The National Council on the Aging (NCOA) recently completed a National Survey of Health and Supportive Services in the Aging Network (NCOA, 2001) to gather information on innovative and effective community programs that address the needs of elders in the areas of social support, caregiving, chronic disease, and physical activity. Nominated by a panel of national experts, almost one in three of these programs are located in senior centers. The NCOA also promulgated standards and guidelines for centers to gain accreditation and, as of 2005, some 120 centers had gone through the self-study and received accreditation.

In conclusion, it is clear that senior centers have grown and diversified over the years. Shifts in federal and state spending, evolving priorities in health and social services for the elderly, with a greater focus on cost-containment and targeting those at risk, and changing demographics and retirement patterns present considerable challenges for senior-center programming. Among the strengths of senior centers are their diversity and ability to serve different segments of the older population in many different ways. Senior centers do many things well with relatively few resources and are certainly capable of improving and expanding existing functions, given the appropriate resources and mission. Although clearly a part of the community-based services system, their role in the long-term-care continuum is still evolving and needs to be better defined. It would be regrettable if the wealth of talent, energy, and dedication found in senior-center professionals, volunteers, and participants were not utilized to the fullest in the 21st century.

JOHN A. KROUT

See also
Adult Day Services
Meals On Wheels
Older Americans Act

Internet Resources
Area Offices on Aging
http://www.aoa.gov

American Society on Aging
http://www.asaging.org

National Association of Area Offices on Aging
http://www.n4a.org

National Council on the Aging
http://www.ncoa.org

REFERENCES

Beisgen, B. A., & Kraitchman, M. C. (2003). *Senior Centers: Opportunities for Successful Aging*. New York: Springer Publishing Company.

Krout, J. A. (1983). Correlates of senior center utilization. *Research on Aging*, *5*(3), 339–352.

Krout, J. A. (1989). *Senior centers in America*. Westport, CT: Greenwood Press.

Krout, J. A. (1990). *The organization, operation and programming of senior centers in America: A seven-year follow-up*. Final report to the AARP Andrus Foundation.

Krout, J. A. (1995). Senior centers and services for the frail elderly, *Journal of Aging and Social Policy*, *7*(2), 59–76.

Krout, J. A. (1996). Senior center programming and frailty among older persons. *The Journal of Gerontological Social Work*, *26*, 3(4), 19–34.

Krout, J. A., Cutler, S. S., & Coward, R. T. (1990). Correlates of senior center participation: A national analysis. *The Gerontologist*, *30*(1) 72–79.

National Council on the Aging (NCOA) (2001). *A national survey of health and supportive services in the aging network*. Washington, DC: The National Council on the Aging.

SENSORY CHANGE/LOSS: SMELL AND TASTE

Chronic problems with taste and smell are common in the elderly population and, although seldom fatal, have a serious impact on quality of life and safety. It has been estimated that 30% of older adults between the ages of 70 and 80 have problems with their sense of smell. Two out of three adults older than 80 report problems with the sense of smell (http://www.nihseniorhealth.gov). Problems with the sense of smell can result from normal aging, environmental exposure, medications, surgical interventions, and chronic disease. Sensory deficits may be an early indication of some neurologic diseases such as Alzheimer's disease and Parkinson's disease (Rawson, 2003).

Approximately two-thirds of taste acuity is dependent on smell. Age-related declines in the number and acuity of taste buds and in the production of saliva, which assists in dissolving food, may contribute to a diminished sense of taste. Smoking, poor oral hygiene, dentures that rub the tongue, nasal polyps, sinusitis, radiation therapy to the head and neck, and side effects of many medications are associated with taste disorders (Miller, 2004; Morley, 2002).

The senses of smell and taste are important components of a holistic assessment of older adults. An appropriate time to evaluate the senses is during cranial nerve examination. The first cranial nerve, the olfactory nerve, can be assessed by having the patient, with eyes closed, occlude one nostril and sniff through the patent nostril to identify a familiar non-noxious odor (e.g., coffee, vanilla). This is repeated with the other nostril using a second scent (Jarvis, 2004). The University of Pennsylvania Smell Identification Test, a 40-question, multiple-choice, scratch-and-sniff tool, is the most widely used clinical olfactory test in the world. It is easy to use in the clinical setting and is a valid and reliable tool. This test (as well as other olfactory testing assessment tools) can be purchased. The Web site that carries this tool is http://www.sensonics.com.

Taste function can be evaluated during the assessment of the facial (seventh) and glossopharyngeal (ninth) cranial nerves by application of a salty solution on the anterior third of the tongue, sweet on the tip, bitter on the posterior third, and sour on the middle third (Jarvis, 2004). The taste buds used to detect salty and bitter are the ones most affected by aging (Rawson, 2003; Winkler, Garg, Medayarajjananonth, Badaeen, & Khan, 1999). The perception of sweet tastes is less affected by aging (Rawson, 2003). Studies have shown that older adults require twice as much salt as younger subjects in order to perceive saltiness (Rawson, 2003), leading to excessive salting of foods. Taste and smell are protective mechanisms. Dangerous situations that can result from impairment of these senses include the inability to smell smoke or a gas leak or to detect spoiled food.

Loss of taste and smell can impact the quality of life for older adults. Scents in the environment that may have been associated with enjoyment or pleasure, such as coffee brewing and the fragrance of flowers, may no longer be detectable. The aroma of favorite foods may be lost. This can cause a decrease in appetite and a decline in food intake that can lead to nutritional deficits (Morley, 2002). Older adults may complain to family and caregivers that their food is unappealing.

The inability to notice offensive personal, pet, or housekeeping odors can impair hygiene and cleanliness. Patient behavior may be misinterpreted as forgetful if hygiene is poor secondary to a decrease sense of smell. Overuse of perfume or cologne by individuals with a decreased sense of smell may somewhat mask body odor but may be offensive to others.

A variety of strategies can be implemented to stimulate and enhance what remains of the sense of smell and taste. Stimulating the sense of smell is important because the scent of food is an appetite stimulant and activates the sense of taste in the taste buds. Mouth care should be performed prior to each meal, with assistance as needed. The teeth, gums, and tongue should be brushed using a soft toothbrush, or the mouth can be rinsed with a solution of half-strength mint mouthwash and warm water. Lemon and glycerin swabs should be avoided because they can contribute to drying of the oral mucosa. To promote nutritional intake, foods should be served separately in an attractive manner, varying in color, shape, texture, and temperature. Blended foods are the most difficult to taste; texture should be added to foods whenever possible, if this is not contraindicated by dietary restrictions such as liquid or pureed diets. For example, chunky instead of smooth applesauce could be used for individuals with swallowing difficulty who are not at risk of aspiration. Warm foods tend to be aromatic and should be served with each meal, allowing the aroma to permeate the environment. Supplementing flavorings in foods rather than adding salt or sugar has been shown to improve food intake and the level of satisfaction among older adults with smell losses (Mathey, Siebelink, de Graaf, & Van Staveren, 2001).

Smoke alarms and pilot lights should be installed or, if financially feasible, gas ranges should be replaced with electric ones. Smoke alarms should be tested frequently for adequate functioning. Some volunteer fire companies sell, install, and test smoke alarms as a fund-raiser for the fire company. Natural gas detectors are available. These battery-operated devices are similar to smoke detectors. They vary greatly in price and are alarm-activated. Some can be easily self-installed. It is recommended to read the manufacture's instructions before purchasing. Elderly individuals should be instructed to read expiration dates on perishable foods prior to eating them. Open foods should be dated to avoid spoiling. Pleasant fragrances, such as lotions, colognes, and flowers can stimulate the sense of smell. A drop of cologne on a light bulb or a room freshener can give the room a pleasant and familiar odor to stimulate the remaining sense of smell.

Ann Marie Spellbring
Ann A. Scheve

See also
Neurological Changes in the Elderly

Internet Resources
University of Pennsylvania Smell and Taste Center
http://www.med.upenn.edu/stc/index.html

National Institutes of Health
http://health.nih.gov/result.asp/649

National Institutes of Health, Senior Health: Problems with Smell and Taste

http://nihseniorhealth.gov/problemswithtaste/toc.html

http://nihseniorhealth.gov/problemswithsmell/aboutproblemswithsmell/01.html

REFERENCES

Jarvis, C. (2004). *Physical examination and health assessment* (4th ed.). St. Louis, MO: Saunders.

Mathey, M. F., Siebelink, E., de Graaf, C., & Van Staveren, W. A. (2001). Flavor enhancement of food improves dietary intake and nutritional status of elderly nursing home residents. *Journal of Gerontology: Medical Sciences* 56A, M200–M205.

Miller, C. A. (2004). *Nursing care of older adults: Theory and practice* (4th ed.). Philadelphia: Lippincott.

Morley, J. E. (2002). Pathophysiology of anorexia. *Clinics in Geriatric Medicine*, *18*(4) 661–674.

Rawson, N. E. (2003). Age-related changes in perception of flavor and aroma. *Generations*, *27*(1), 20–26.

Winkler, S., Garg, A. K., Medayarajjananonth, T., Badaeen, L. G., & Khan, E. (1999). Depressed taste and smell in geriatric patients. *Journal of the American Dental Association*, *130*(12), 1759–1765.

SEXUAL HEALTH

Human sexuality has biological, affective, motivational, and cognitive aspects. Sexual behavior or activity involves the genitalia and erogenous zones. *Sexuality*, however, is a broader term that includes sexual behavior, sex, emotions, attitudes, and relationships (Woodson, 1997). Age-related changes associated with sexual health and sexuality include biological, pharmacological, and psychosocial factors. Often, one or more of these factors may lead to sexual dysfunction. The incidence of many sexual disorders increases and sexual activity declines with advancing age. For healthy community-dwelling older men, there is a clear decline in sexual function, with erectile dysfunction as the main complaint. Female sexual dysfunction also increases with age. Common dysfunctions in older women include declining lubrication and desire, symptoms that increase mainly during menopause.

Many older individuals still enjoy very healthy sexual lives; certain barriers exist, however. One is lack of a partner. This is especially a problem for women. For example, a recent American Association of Retired Persons (AARP) survey reported that only 58% of men and 21% of women older than age 75 had a partner (AARP/Modern Maturity Sexuality Survey, 1999).

Clinician reluctance to query patients about their sexual activity is based, in part, on the societal norm that sexuality and sexual behavior are private. Although clinicians may express reluctance in discussing sexual issues with their older patients, most men and women want their physicians to inquire. A recent survey of female sexual health concerns (Nusbaum, Singh, & Pyles, 2004) in women seeking routine gynecological care demonstrated that the topic of sexuality is rarely discussed, even though most women felt their physicians ought to know a lot about sexuality. Additionally, people frequently differ on what is meant by *sex*. The term is often used interchangeably to refer to a person's gender; to kissing or caressing; and to oral, vaginal, and anal intercourse. Hence, an accurate history is often difficult to obtain if clinicians or patients are unwilling to use the appropriate terms.

Sexual dysfunction (e.g., impotence, premature ejaculation, and anorgasmy) or simply the inability to appreciate or want an intimate physical experience is often driven by notions of physical attractiveness and proscriptive societal, religious, and cultural norms about appropriate elders' sexual behavior. Sex education for senior citizens has not been a high-priority health issue; few elderly are knowledgeable about changes in sexual response associated with aging or how to compensate for them. Information might help elders avoid fear, ridicule, and, in some cases, anxiety and depression. Additionally, the teaching of safe sexual practices, such as the use of condoms, is crucial to help prevent sexually transmitted diseases and the spread of the human immunodeficiency virus (HIV). This is especially important in light of Centers for Disease Control and Prevention estimates that approximately 11% of the total number of AIDS cases reported through June 2001 in the United States involved persons older than 50 years of age at time of diagnosis (Centers for Disease Control and Prevention, 2000).

The Sexual Response Cycle

In general, more time is needed by older sexually active men and women to be sexually aroused, complete intercourse, achieve orgasm, and be rearoused in comparison to younger sexually active individuals. Testosterone decrease, a normal age-related change in men, reduces the tone of erectile tissue. Changes in collagen and the vascular endothelium may impair erection stiffness or frequency. Erection can take longer to achieve, be less full, and be maintained without ejaculation in comparison to younger men. Force of the ejaculation is decreased; volume of seminal fluid is less; and there are fewer contractions with orgasm, rapid loss of erection, and a longer refractory period.

Women also experience fewer orgasmic contractions; vasocongestion reduces more rapidly in older than in younger women. Fatty tissue loss in the pelvic area may predispose the clitoris to becoming more easily irritated. Vaginal estrogen cream or water-based lubricants can be applied directly to the vagina to treat such irritation. Diminished libido is more likely related to increased age, dyspareunia, body-image change secondary to breast or gynecological surgery, and psychosocial factors rather than to the physiology of menopause. Hormone replacement alone is not sufficient to restore flagging libido or loss of interest in sexual activity.

Diseases and Diagnostics Associated with Sexual Dysfunction

Various endocrine, vascular, neurological, and psychological diseases and their pharmacological treatments can affect sexual health. Medications that may cause erectile dysfunction (ED) include certain antidepressants such as selective serotonin reuptake inhibitors, monoamine oxidase inhibitors, and tricyclic antipressants; tranquilizers; and anticholinergics and phenothiazines (Doerfler, 1999). In addition, almost all antihypertensive drugs, including diuretics, sympatholytics like α-methyldopa, β-blockers, α-blockers, vasodilators, calcium channel blockers, and ACE inhibitors (Thomas, 2003), have been implicated in sexual dysfunction.

Postmenopausal estrogen deficiency causes changes in the entire pelvic region, including reduction in the length of the vaginal vault, atrophy of the vaginal epithelium, and reduced amount and acidity of vaginal secretions, all of which predispose to infections and can cause dyspareunia. Urinary incontinence and irritation of the bladder and urethra because of thinning of the vaginal wall may also discourage a woman from having sexual relations.

For older men, erectile dysfunction is by far the most common of sexual dysfunctions, with vascular disease being the most common cause of ED. It is associated with many medications, prior surgical procedures, and disease processes. Emotional factors associated with ED include anxiety, depression, alcohol use, and fatigue. Treatment approaches include self-injection of intracavernosal medications that are smooth-muscle relaxants (i.e., prostaglandin E, papaverine, and phentolamine in a combined low dose); oral ingestion of phosphodiesterase inhibitors, including sildenafil citrate (i.e., Viagra), vardenafil (i.e., Levitra), and tadalafil (i.e., Cialis); external vacuum devices; implants or prostheses; and revascularization. The phosphodiesterase inhibitors should not be taken more than once daily and are contraindicated in patients with cardiovascular disease and those who require nitrates. Vacuum devices are the least invasive; newer models reduce ejaculatory pain associated with earlier devices.

Certain diseases and medical conditions are more commonly associated with sexual side effects. For example, after a stroke, men can have erectile and ejaculatory difficulties, and women may experience reduced vaginal secretions. Spouses also have a decreased libido and reduced sexual satisfaction. Parkinson's disease is associated with loss of sexual desire and other sexual dysfunction. L-dopa improves sexual performance because it elicits a richer sense of well-being and increased mobility. Men and women with diabetes mellitus may have a variety of sexual difficulties at earlier ages than other individuals. Men may experience erectile dysfunction and decreased libido and women may develop clitoral nerve damage and vascular damage (Morley & Tariq, 2003). Three months after a myocardial infarction (MI), if the patient can climb two flights of steps without chest pain, sexual activity can be resumed.

Interventions for and Prevention of Sexual Dysfunction

Lifestyle changes in midlife, such as regular exercise, reduced-fat diet, and smoking cessation, increase the probability of remaining potent and sexually active. Interventions and prevention strategies must, of necessity, be contingent on careful assessment and identification of contributing factors. As with many topics in professional and lay education, knowledge acquisition does not automatically become a blueprint for changed behavior or attitude. Clinicians and caregivers may need time to recognize and understand their own feelings about sexual activity, the source of their attitudes, and the range of options for older people.

Those who are socially isolated by virtue of geographic location, finances, loss of partner (through death or institutional placement), or language proficiency may require counseling and community-based support services. Clinicians must address chronic medical conditions, including pain, and must address the benefit, burden, and consequences of each treatment option. Appropriate physical-fitness programs for cardiac patients can moderate the physical signs and anxiety associated with sexual activity. Those suffering from arthritis (women more than men) can achieve sexual pleasure with a combination of effective arthritis-management strategies and sexual-position change.

Clinicians should assess the elderly patient's sexuality, validate and reassure age-related sexuality changes, counsel and educate patients who must cope with altered body image and age effects, and refer patients for special diagnostics and therapy when indicated. This requires sensitivity to the culture, constraints, language, and sexual interests of patients. A therapeutic environment between provider and patient recognizes the embarrassment, for some, associated with sexual topics and language (Meerabeau, 1999). The clinician must balance support of an older person's possible lack of interest in sexual activity while dispelling the myths and stereotypes that reduced physical intimacy is a natural consequence of aging.

LIZETTE J. SMITH

See also

Atrophic Vaginitis
Gay and Lesbian Aging
Social Isolation
Social Supports (Formal and Informal)
Urinary Tract Infections

Internet Resources

Aging and Human Sexuality Resource Guide
http://www.apa.org/pi/aging/sexuality.html

Helpguide: Lifelong Sexuality
http://www.helpguide.org/life/sexuality_aging.htm

Sexual Health Information Center: Sex and Aging
http://www.sexhealth.org/infocenter/SexAging/sexaging.htm

Sexual Health Network
http://www.sexualhealth.com

REFERENCES

AARP/Modern Maturity Sexuality Survey (1999). Prepared by NFO Research, Inc., for AARP.

Centers for Disease Control and Prevention, Division of HIV/AIDS Prevention (2000). *Semiannual HIV/AIDS Surveillance Report 2000*. Atlanta: Centers for Disease Control and Prevention.

Doerfler, E. (1999). Male erectile dysfunction: A guide for clinician management. *Journal of the American Academy of Nurse Practitioners*, *11*(3), 117–123.

Meerabeau, L. (1999). The management of embarrassment and sexuality in health care. *Journal of Advanced Nursing*, *29*(6), 1507–1513.

Morley, J. E., & Tariq, S. H. (2003). Sexuality and disease. *Clinics in Geriatric Medicine*, *19*, 563–573.

Nusbaum, M. R., Singh, A. R., & Pyles, A. A. (2004). Sexual health care needs of women aged 65 and older. *Journal of the American Geriatrics Society*, *52*, 117–122.

Thomas, D. R. (2003). Medications and sexual function. *Clinics in Geriatric Medicine 19*, 553–562.

Woodson, S. A. (1997). Sexual health across the lifespan: Teaching women about their sexuality. *Association of Women's Health, Obstetric and Neonatal Nurses Lifelines*, *1*(4), 34–39.

SIGNAGE

Signs are a way of compensating for an unfamiliar environment and would be unnecessary if all environments were designed to be self-explanatory. It is ironic that some of the most unfamiliar environments are hospitals and large residential institutions and that the people who have to interact with them may have the most difficulty reading or understanding signs.

The ability to navigate independently through an environment enhances autonomy. An environment that is difficult to navigate can make people feel confused, anxious, irritable, or frustrated. They may lose confidence or form a poor image of the institution. Staff may become frustrated by visitors frequently asking them how to find their destination.

Older adults tend to be of smaller stature than younger adults are; some may have a slight forward head tilt. Poor eyesight and dementia, common in elderly people, can make reading and understanding signs difficult. Age-related vision changes include opacities in the central lens (i.e., cataracts), opacities in the periphery of the lens, changes in the vitreous (resulting in an increased scattering of light), deterioration in visual acuity (even in the absence of cataracts), yellowing of the lens, and decreased upward gaze in some people. These changes may cause difficulty reading small writing or indistinct lettering, unevenness in the perception of color, and a sensitivity to glare. Sensitivity to glare becomes even more problematic in bright light or in environments with bright surfaces. Glaucoma, if present, can constrict peripheral vision. The effects of dementia that can affect a person's ability to recognize signs are a decreased ability to read, interpret abstract symbols, reason or problem-solve, and make a mental map of a building or space, and an unreliable memory of recent events.

Signs should be easily seen, easily understood, and attractive. They should be designed primarily for people unfamiliar with the environment, such as visitors or people with poor memory, rather than for staff. The lettering should be clear and simple. Generally, a sans serif font is easier to read for short signs. A combination of upper and lower case is preferable because the use of all upper-case letters removes the word's "shape" and decreases legibility.

Dark lettering on a light background with minimal use of different colors is easiest to read. Blue can be difficult to differentiate from black. Red on black is difficult for color-blind people. Yet, certain colors are now internationally associated with safety. Red indicates prohibition or stop. Yellow indicates caution or risk of danger, such as where infectious or hazardous materials are present. Blue indicates some mandatory action, such as "break glass in case of fire." Green indicates a safe action or safe condition, such as a fire exit (Baron, 1987; Department of Health and Social Security and the Welsh Office, 1984). Conventions in current practice may not carry the same meaning for people with dementia if their memory is of an earlier time (Calkins, 1988).

The size of a sign is determined by its location and the target population. The minimum recommended letter height for the general population is that capital letters should be 1 inch high for every

30 feet of viewing distance (or 3 cm high for every 10 m viewing distance) (McLendon & Blackistone, 1982). The size should be larger for an elderly population.

Images can enhance comprehension but should be used in addition to words, not as a replacement for them (Gross et al., 2004). The image should be realistic rather than abstract. People with dementia find a realistic picture of a toilet more recognizable than the international symbol of a male or female stick figure. Potential images should be tested on the target population (Wilkinson, Henschke, & Handscombe, 1995).

Sign location is best determined by assuming the role of a visitor coming to the building for the first time. Every point throughout the building that requires a decision by the visitor should have a sign. Signs protruding perpendicular to a wall may be more visible in some situations, but they should not be placed too high.

In a complex environment, a hierarchy of signs can be helpful (MacKenzie & Krusberg, 1996). Directions can be given to a general area and, as a person approaches the desired destination, more specific directions can be given. Ideally, a sign should provide only enough information to allow someone to reach the next decision point. The more information provided, the longer it takes to read and the harder it is to remember. Signs intended for staff use can be differentiated from those intended for public use. Signs for staff can be smaller, in a different color, and placed below those for the public.

Lighting should be sufficient but should not create glare. Signs placed in a "puddle" of darkness between two bright areas are harder to see and less likely to be regarded as important. Glare comes not only from inappropriate lighting but also from shiny or polished surfaces.

To the extent possible, language should be in "plain English" and use natural speech, such as would be used when talking to a friend. Depending on the local culture, "toilet" is usually preferable to "rest room," "lavatory," "bathroom," or "powder room." "X-Ray Department" is more easily understood by laypeople than "Department of Medical Imaging" or "Radiology." People understand "ear, nose, and throat" more easily than "otorhinolaryngology." The language should be friendly and positive. For example, "No Parking" can be made more positive by erecting an arrow and sign to the "Visitors' Car Park."

Signs are not just written labels or symbols. Latent clues, such as placing chairs outside a room designed for sitting, are a form of sign that may be more comprehensible than writing. Labeling of some areas, such as toilets, may require a combination of sign clues. Some people may follow a clearly written sign, some may recognize a bright canopy above the door, some may be guided by the door color, and others may need personal guidance. Ensuring that all toilet doors are a particular color, all exit doors are a different color, and all cupboard doors are the same color as the walls are important indicators of their function. A reception area is more recognizable if it is in an open, accessible space, has a counter with someone behind it, and is well lit.

Signs should be considered in the overall design of a building rather than as an afterthought. The environment should be as self-explanatory as possible and should not rely on the people being able to remember where they are or how they got there (Judd, Marshall, & Phippen, 1998). Signs are necessary when there has been a failure or inability to achieve this. They should avoid unnecessary detail and be simple, attractive, clearly written, well placed, and designed with the first-time visitor in mind.

TIM J. WILKINSON

See also

Environmental Modifications: Home, Institutional
Low Vision
Vision Changes and Care
Vision Safety

Internet Resources

Design Forum
http://designforum.aiga.org/content.cfm?ContentAlias=%5Fgetfullarticle&aid=1415414#ContributorBio

Lighthouse International
http://www.lighthouse.org/

Project for Public Spaces
http://www.pps.org/upo/info/amenities_bb/signage_guide

REFERENCES

Baron, J. H. (1987). Signpost your hospital. *British Medical Journal*, *295*, 482–484.

Calkins, M. P. (1988). *Designing for dementia: Planning environments for the elderly and the confused*. Owings Mills, MD: National Health Publishing.

Department of Health and Social Security and the Welsh Office (1984). *Report No.* 65: Building Components. London: Her Majesty's Stationery Office.

Gross, J., Harmon, M. E., Myers, R. A., Evans, R. L., Kay, N. R., Rodriguez-Charbonier, S., et al. (2004). Recognition of self among persons with dementia: Pictures versus names as environmental supports. *Environment and Behavior*, *36*(3), 424–454.

Judd, S., Marshall, M., & Phippen, P. (1998). *Design for dementia*. London: Hawker Publications, LTD.

MacKenzie, S., & Krusberg, J. (1996). Can I get there from here? Wayfinding systems for health care facilities. *Leadership in Health Services*, *5*, 42–46.

McLendon, C. B., & Blackistone, M. (1982). *Signage: Graphic communications in the build world*. New York: McGraw-Hill.

Wilkinson, T. J., Henschke, P. J., & Handscombe, K. (1995). How should toilets be labelled for people with dementia. *Australian Journal on Aging*, *14*, 163–165.

SKIN ISSUES: BRUISES AND DISCOLORATION

General health, diet, heredity, activity, and environmental exposure influence the rate at which age-related skin changes occur. Changes in the function and appearance of the skin due to aging alone, known as intrinsic aging, include decreased wound healing, decreased elasticity and tensile strength, diminished ability to respond to injury, decreased mechanical protection and insulation, and diminished ability to thermoregulate (Hazzard, Blass, Halter, Ouslander, & Tinetti, 2005).

Most age-related skin changes are not the result of aging alone but are due to a combination of aging and chronic environmental exposure, primarily sun exposure, which causes the most damaging and cosmetically compromising effects on the skin (Fedor & Mash, 2001). This process, *photoaging*, is responsible for wrinkling and yellowing of the skin and thickening of the epidermis on sun-exposed areas. In addition, sebaceous glands enlarge, blood vessels become dilated and tortuous, and skin pigmentation becomes mottled. The physiological consequences of intrinsic aging result in the characteristic features commonly observed in the skin of older adults, such as fragility, tears, discoloration, and bruising. However, discoloration and bruising may be accelerated or exacerbated by the effects of photoaging.

Although it is commonly believed that the epidermis thins with advanced age, research shows flattening of the dermal-epidermal junction due to retraction of the papillae that connect the dermis to the epidermis. The result is a reduction in the surface area of the skin rather than an actual thinning of the epidermis; it leads to poor nutrition and adhesion between these two layers and an overall decrease in the resilience of the skin. The combination of these factors results in separation of these layers and the likelihood of skin tears. Older adults are therefore more susceptible to bruises, blistering, and abrasions from mechanical stress or shear-type injuries.

Changes in the pigmentation, or coloration, of the skin also are noticeable with age. Melanocytes in the epidermis show some decline in function; the remaining cells may be unevenly distributed and not functioning normally. As a result, the skin becomes blotchy and unevenly pigmented, with areas of brown, spotty pigmentation frequently occurring on the scalp, neck, face, arms, and hands. These benign macular lesions are termed *liver spots* (i.e., solar lentigines) or *senile freckles* and are commonly referred to as "age spots." A decrease in melanocytes also reduces tanning, and the ability of the remaining melanocytes to shield the underlying dermis from ultraviolet rays is diminished (Hazzard et al., 2005). Older adults are at increased risk for sun-exposure skin damage, predisposing to both benign and malignant skin changes.

The density, cellularity, and vascularity of the dermis progressively diminish with aging, resulting in loss of elasticity and turgor and less "give" under stress. The characteristic pale, thin, paper-like quality of the skin further contributes to tear-type injuries. Vascular changes in the dermis predispose older adults to *petechiae*, or minor bruising. The thin-walled, fragile blood vessels lose their connective-tissue support. Following minor trauma, petechiae develop due to the fragile nature of the skin and increased capillary fragility. Areas of ecchymosis subsequently develop. These well-defined red-brown macules, termed *senile purpura*, vary in size from a few millimeters to several centimeters (Hazzard et al., 2005). They occur most commonly on the exposed surfaces of the forearms and hands but can occur elsewhere as well.

Minor bruising is a normal and common finding in older adults. Women usually bruise more easily than men, and a tendency to bruise easily may be hereditary. Bruising from minor injuries is common on the forearms, hands, legs, and feet. Age-related changes in the skin coupled with the damaging effects of sun exposure cause blood vessels to break easily, leading to bruising. Bruising also may be an indicator of a pathological process such as acute leukemia or Cushing's syndrome (Valente & Abramson, 2006). In addition, a number of pharmacological agents can induce purpuric bleeding, such as sulfas, aspirin, nonsteroidal anti-inflammatories, thiazides, procaine penicillin, phenytoin, methyldopa, barbiturates, and coumadin. Bleeding ceases when the drug is withdrawn. Of note, corticosteriods can thin the skin, increasing the likelihood of bruising from minor trauma. In addition, some dietary supplements such as fish oils, ginkgo, ginger, and garlic have a blood thinning effect, reducing the blood's ability to clot, thereby allowing enough blood to leak into the tissues to cause bruising. Also, deficiencies in vitamins B_{12}, C, K, or folic acid may increase the frequency of bleeding.

A system of dating bruises was described by Noble and colleagues (1996). The approximate age of a bruise can be categorized as 0 to 2 days, red (swollen and tender); 2 to 5 days, red to blue; 5 to 7 days, green to yellow; 10 to 14 days, brown; and 14 to 28 days, clearing (p. 1684). Mosqueda and colleagues (2005) studied the life cycle of bruises in 100 older adults 65 and older (mean age = 83). Although a system of dating bruises may be helpful as a general guide, they concluded that the age of a bruise cannot be reliably predicted by its color (p. 1339). They found that the period that bruises were visible varied from 4 to 41 days (mean = 11.73+/- 7.13 days). Half of the bruises (54%) resolved by day 6 and most (81%) resolved by day 11. Interestingly, contrary to the perception that yellow indicates an old bruise, 16 bruises were predominately yellow on the first day of observation, and 30 bruises were largely purple on the 10th day of observation (p.1342). Although there is some research to support that a yellow color occurs significantly faster in individuals 65 and older, it is clear that further research is necessary to learn more about bruising in this population.

The presentation of a bruise is influenced by many factors, including the amount of force and area of injury, health status of the older adult, condition of the skin, and medications known to induce purpuric bleeding. Major bruising can occur in individuals who have coagulation deficiencies, liver disease, and a warfarin overdose (Hazzard et al., 2005). Often, laboratory studies such as platelet count, bleeding time, prothrombin time, or partial thromboplastin time are performed when there is a question about the extent and amount of bruising present.

A thorough history and careful examination of the skin can provide important information about the health status of the older adult and possibly serious problems, such as falls, neglect, and abuse. Multiple bruises in various stages of healing may alert the clinician to problems of physical abuse, alcoholism, or self-neglect.

Clinical evaluation is based on a thorough understanding of the normal skin changes associated with aging. This knowledge is essential to distinguish changes that may signal the presence of a more serious problem requiring further evaluation.

Maintaining skin integrity and preventing injury are important goals for clinicians working with older adults. Hardy (2001) offers some helpful tips on skin care. Strategies to promote healthy skin include a diet with adequate amounts of vitamins A and C and fluids. Humidification and the application of emollient lotions at least twice a day, particularly after bathing, help prevent dryness, which makes the skin more susceptible to tears. Mild soaps such as Dove, Bass, Tone, and Caress should be used when bathing. Daily bathing (i.e., complete bath or shower) should be discouraged for those with dry skin. Suggestions on bathing patterns in this population vary from a partial daily bath to a complete bath two to three times per week (Hardy, 2001). Additionally, skin care products that contain alcohol or perfumes should be avoided because of their drying effect.

Older adults can avoid sun damage by wearing sun visors, wide-brimmed hats, and long-sleeved cotton shirts while in the sun. Sunscreen with an SPF of at least 15 should be frequently applied, and older adults should be encouraged to avoid sun exposure during the late morning and early afternoon hours.

Frequent changes in position are important for older adults who have activity or mobility limitations. Skin breakdown is more likely to occur in the presence of impaired circulation and external pressure. Many pressure-relieving appliances are useful in maintaining skin integrity. Proper positioning in bed, with the head of the bed elevated and the knees flexed and supported, helps prevent shearing of the skin against the bed surface.

Environmental factors such as cluttered rooms; poor lighting; slippery floors; low, soft furniture; and sharp-cornered objects are the cause of many accidental injuries. These potential hazards can be avoided by creating an environment that is safe, well lit, comfortable, and stimulating for the older adult. Prevention plays a key role in maintaining skin integrity and reducing potential problems.

Barbara J. Edlund

See also

Burns and Related Safety Issues
Integumentary System
Skin Tears

Internet Resources

Bumps and Bruises (Contusions and Ecchymoses)
http://www.medicinenet.com/bruises/article.htm

Medline Plus
http://www.nlm.nih.gov/medlineplus/ency/article/003235.htm

Gale Encyclopedia of Medicine
http:// www.healthatoz.com/healthatoz/Atoz/ency/bruises.jsp

REFERENCES

Fedor, M., & Mash, M. (2001). The skin. In R. J. Ham, P. D. Sloane, & G. A. Warshaw (Eds.), *Primary Care Geriatrics* (4th ed). St. Louis, MO: Mosby Company.

Hardy, M. (2001). Impaired skin integrity: Dry skin. In M. L. Maas, K. C. Buckwalter, M. D. Hardy, T. Tripp-Reimer, M. C. Titler, & J. P. Specht (Eds.), *Nursing care of older adults, diagnoses, outcomes, & interventions*. St. Louis, MO: Mosby Company.

Hazzard, W. R., Blass, J. P., Halter, J. B., Ouslander, J. G., & Tinetti, M. (2005). *Principles of geriatric medicine and gerontology* (5th ed.). New York: McGraw-Hill.

Mosqueda, L., Burnight, K., & Solomon, L. (2005). The life cycle of bruises in older adults. *Journal of the American Geriatrics Society*, *53*(8), 1339–1343.

Noble, J., Greene, H. L., Levinson, W., Modest, G. A., & Young, M. J. (1996). *Textbook of primary care*. St. Louis, MO: Mosby Company

Valente, M. J., & Abramson, N. (2006). Easy bruisability. *Southern Medical Journal*, *99*(4), 366–370.

SKIN TEARS

Skin tears are a common injury among elders, particularly those who are institutionalized. The incidence of skin tears in skilled-nursing facilities has been estimated at 1.5 million annually, almost one per resident per year. It is widely believed that skin tears are significantly underreported because of their perceived low risk. Costs for care of skin tears have been estimated at $10 per day for up to 30 days, for an estimated annual expense of $4.5 billion (Malone, Rozario, Gavinski, & Goodwin, 1991). Although rarely life-threatening or disabling, a skin tear can be a source of pain and disfigurement, as well as a site for infection; it is important that facilities have detailed, evidence-based protocols in place for consistent care.

Definition and Classification

A skin tear is a flap-like separation of the epidermis from the underlying dermis or connective tissue. The injuries may be jagged or L-shaped in appearance and are most often associated with minor trauma, friction, or shear.

Skin tears are classified into three categories (Payne & Martin, 1990). Category I tears are linear, and the skin flap can be completely placed back over the open area with no loss of skin coverage. Category II tears have partial loss of the skin flap, whereas Category III tears have no flap of skin to cover the open wound.

Eighty percent of skin tears occur in the upper extremities, particularly the forearms, elbows, and hands. Other sites include the shin, back, and buttocks. Skin tears over bony prominences should not be mistaken for stage II pressure ulcers, which have a different etiology and treatment and may be a reportable event.

Cause

There are many causes of skin tears. Families and patients often perceive skin tears as the result of poor care or rough handling. Providers should assess patients with skin tears for risk of abuse or neglect. Recurrent skin tears may also be predictive of more serious health problems, such as delayed healing.

More than half of reported skin tears have no apparent cause. Wheelchair injuries account for 25% of skin tears, accidental bumping into objects in the room is associated with 25%, transfers lead to 18%, and falls account for the remainder of skin tears, about 13% (McGough-Csary & Kopac, 1998).

Skin tears originate with both intrinsic and extrinsic risk factors. Intrinsic factors include the normal dermal and subcutaneous tissue loss associated with aging, as well as the loss of tensile strength and elasticity. Slowed production of sebum causes the skin to be drier. The Rete pegs, which are the structures responsible for the adherence of the epidermis to the dermis, shorten with aging, making separation of the layers more likely with the application of directional force (e.g., friction, shear). Other factors increasing a patient's risk for skin tears include diminished sensation, limited mobility, poor nutrition, systemic steroid therapy, stiffness and spasticity, limited vision, dementia, polypharmacy, and history of previous tears (Ayello, 2003).

Extrinsic factors include lifts and transfers, repositioning, bathing frequency and type of soap, and use of assistive devices such as wheelchairs. Furniture arrangement, clutter, and room lighting also contribute to skin tear risk (Baranoski, 2000).

Documentation

The wound should be thoroughly described upon discovery, including the exact location, size in centimeters, direction of the tear, appearance, associated pain, drainage type and amount, treatment measures, and circumstances leading to the injury, if known. If the cause was lift-related, for example, the care plan should be amended to include lifting precautions. Individual facilities may require an incident report. It is advisable to notify the patient's family or significant other; such notification may be mandated. The wound should be assessed and described at least weekly in documentation. Collection of data on skin tears can lead to process quality improvement in a facility (Baranoski, 2000).

Treatment

The skin tear should be gently irrigated with sterile normal saline to remove drainage, blood, and debris.

If the edges of the skin flap can be approximated over the wound (Category I), the flap is replaced on the wound edges using sterile technique. The edges of the flap can be affixed to the surrounding skin with wound closure strips (e.g., Steri-strips) (Baranoski, 2000). Category II skin tears should have the partial skin flap straightened and approximated over the wound.

All category skin tears should be covered with a nonocclusive, nonadherent, dressing such as petrolatum or xeroform gauze. The dressing should not stick to the wound bed. Some clinicians are reporting good results with nonadherent silicone dressings, which can be removed to visualize the wound and then replaced. Absorptive dressings, such as gauze 4X4s or rolled gauze, can be applied over the nonadherent to absorb drainage. These dressings can be held in place with rolled gauze or mesh tubing. The dressing should be changed as often as necessary to keep it clean and dry. Steri-strips should not be removed until the flap has healed. Pain medications administered on a regular basis may be necessary for the patient to continue with daily activities (Ayello, 2003).

Treatments to Avoid

Common treatment for skin tears in the past has included the use of transparent occlusive film dressings. These do provide some skin protection and hold the skin flap in place, but they have significant disadvantages. Accumulation of exudate at the wound site can lead to maceration of healthy tissue. Removal of these very adherent dressings can cause additional skin trauma (White, Karam, & Cowell, 1994).

If a patient is admitted with a transparent dressing already in place over a skin tear, it may be better to leave it in place rather than risk causing further injury by changing the dressing. If an area of liquefied blood appears under the dressing, it can be left alone unless the site appears infected (Baranoski, 2000). To remove a transparent film dressing, gently push the skin away from the dressing rather than removing the dressing from the skin. Dressings that are not nonadherent, such as gauze, should not be placed directly over the skin tear. Tape should not be applied to at-risk skin. Antimicrobials such as hexachlorophene, povidone/iodine, and chlorhexidine deter the healing rate of wounds and are not recommended.

Prevention

Assessment of risk is an important step in preventing skin tears. The Braden and Norton scales include subscales pertinent to skin-tear risk, such as friction and shear, nutrition, and mobility (Ayello, 2003). Patients dependent on others for all activities of daily living are at greatest risk, with tears occurring during lifting, positioning, transferring, dressing, and bathing. Independently ambulating patients have the second highest number of skin tears, occurring mostly on the lower extremities. The third highest category of patients with skin tears were sight-impaired, who sustained their injuries from bumping into furniture and equipment (White et al., 1994).

Caregivers should be knowledgeable about proper positioning, lifting, and transferring techniques and devices in order to reduce friction and shear. The use of a gait belt under the axillae can help the caregiver to lift without using the patient's arms. Hard surfaces in the patient environment can be padded, such as wheelchair arms and leg supports and bed rails. Clearing a safe, well-lit path for sight-impaired elders is also helpful. If agreeable to the patient, recommend the wearing of long sleeves and pants (White et al., 1994). Patients at risk should be bathed less often, no more than three times weekly, with an emollient soap. Avoid the use of adherents such as tape to secure dressings and tubes.

'LISSA CLARK
JOYCE M. BLACK
STEVEN B. BLACK

See also

Integumentary System
Pressure Ulcer Prevention and Management
Pressure Ulcer Risk Assessment
Skin Issues: Bruises and Discoloration

Internet Resources

Wound, Ostomy, and Continence Nurses Society
http://www.wocn.org

National Guideline Clearinghouse: Preventing Pressure Ulcers and Skin Tears
http://www.guideline.gov

REFERENCES

Ayello, E. A. (2003). Preventing pressure ulcers and skin tears. In M. D. Mezey, T. Fulmer, I. Abraham, & D. A. Zwicker (Eds.), *Geriatric nursing protocols for best practice* (2nd ed.). New York: Springer Publishing Company, Inc. (pp. 165–184).

Baranoski, S. (2000). Skin tears: The enemy of frail skin. *Advanced Skin Wound Care*, *13*, 123–126.

Malone, M., Rozario, N., Gavinski, M., & Goodwin, J. (1991). The epidemiology of skin tears in the institutionalized elderly. *Journal of American Geriatrics Society*, *39*, 591–595.

McGough-Csary, J., & Kopac, C. (1998). Skin tears in institutionalized elderly: An epidemiological study. *Ostomy Wound Management*, *44*, 14S–24S.

Payne, R., & Martin, M. (1990). The epidemiology and management of skin tears in older adults. *Ostomy Wound Management*, *26*, 26–37.

White, M., Karam, S., & Cowell, B. (1994). Skin tears in frail elders: A practical approach to prevention. *Geriatric Nursing*, *15*(2), 95–99.

SLEEP DISORDERS

Glossary of Sleep Terms

- *Apnea*: Cessation of breathing for 10 or more seconds during sleep.
- *Excessive daytime sleepiness*: Subjective difficulty in staying awake; also known as EDS, somnolence, and hypersomnia.
- *NREM sleep:* Sleep stages that progress from light (stage 1) to deep sleep (stages 3 and 4).
- *Phase advance.* A change in the circadian cycle of wake/sleep in which the individual falls asleep early in the evening and wakes too early the next morning.
- *Polysomnography*. An overnight sleep study conducted using the following: EEG, EOG, EMG, EKG, respiratory airflow, respiratory movements, leg movements, and other parameters, depending on the patient.
- *Rapid eye movement (REM) sleep:* The stage of sleep characterized by muscular twitching, irregular breathing, irregular heart rate, and increased autonomic activity when dreaming occurs.
- *Sleep consolidation:* An optimal physiologic condition in which sleep occurs without interruption in one block of time.
- *Sleep efficiency:* A ratio (%) calculated as follows: total sleep time divided by time in bed multiplied by 100.
- *Sleep fragmentation*: Disruption of sleep that results in arousals or abrupt transition to a lighter stage of sleep.
- *Sleep hygiene:* Behaviors, routines, and activities that contribute to quality and quantity of sleep.
- *Sleep latency:* How long it takes to fall asleep after "lights out."
- *Sleep maintenance:* Ability to sleep consistently throughout the desired sleep interval.
- *Wake after sleep onset:* The interruption of sleep by intervals of waking due to environmental stimuli (noise), caregiving demands, or illness (pain).
- *Zeitgeber*: An environmental or social cue for perception of time, for example: (1) bright light exposure is a cue for daytime activity and wakefulness, and (2) a meal of eggs and toast for a hospitalized patient will indicate that it is morning.

Normal Sleep

Normal changes in sleep with aging include decreased sleep efficiency, decreased restorative sleep (stages 3 and 4), and increased sleep latency, more sleep fragmentation, and decreased sleep maintenance (Bliwise, 2005). The timing and balance of sleep and wakefulness is regulated by two body systems: the homeostatic sleep/wake process and the intrinsic circadian biological clock (Borbely & Achermann, 2005). The circadian biological clock is an internal mechanism that regulates the 24-hour sleep-wake cycle and is controlled by a group of cells in the hypothalamus called the *suprachiasmatic nucleus* (SCN). Humans are diurnal animals who have evolved to be active in daylight hours and to sleep in darkness. At the physiologic level, light enters the eye and travels via the optic nerve to the SCN, where the function and timing of this biologic clock is reset on a daily basis. Thus, bright light reinforces and promotes activity and wakefulness, whereas darkness helps trigger sleep-promoting physiological events. In addition, the homeostatic sleep drive or propensity to fall asleep depends on the degree of sleep pressure, a factor that increases progressively as waking hours accumulate and decreases with an adequate amount of good quality sleep.

Circadian Disturbances

As people age, there are changes in sleep architecture and in the circadian pattern of alertness and sleepiness. Older adults have more problems with sleep latency, increased sleep fragmentation, and poor sleep maintenance with more time awake after sleep onset. In addition, elders experience changes in their social environment and exposure to wake- or sleep-promoting zeitgebers, which are reinforcing cues that help maintain regularity of the circadian clock. For example, exposure to bright light in the mornings reinforces the normal sleep-wake cycle, but exposure to only dim light weakens this rhythm. Likewise, conditions that contribute to social isolation, such as visual impairment or hearing deficits, curtail participation in social activities that support daytime activity and wakefulness. Conversely, vigorous and engaging daytime activity promotes restful and satisfying sleep the following night. The circadian rhythm of activity and sleep can become altered over time and cause noticeable problems such as falling asleep too early in the evening and then waking too early the next morning. Phase advance in the circadian rhythm acts as a barrier to healthy social interaction but can be treated by reintroducing zeitgebers and behavioral strategies such as regular exposure to bright light and physical activity during the day and eliminating naps.

Insomnia

Recent studies comparing younger and older adults found that the elderly (i.e., older than 65 years) are approximately 1.5 times more likely to have sleep difficulties. In addition, women are more likely to report symptoms of insomnia, which includes complaints of increased sleep latency, premature waking after sleep onset, and very early arousal that results in shortened total sleep time. Although insomnia may be organic, psychological, pharmacological, chronobiological, or a behavioral in origin, it has also been documented as occurring secondary to cardiovascular, respiratory, gastrointestinal, renal, and musculoskeletal disorders.

Insomnia may be transient or chronic, and the perception of sleep duration may not correspond to objective assessment. Anxiety associated with emotional conflict, stress, recent loss, feelings of insecurity, and change in living arrangements can also produce insomnia. General anxiety and the conditioned arousal response at sleep onset associated with insomnia may also prompt more frequent use of hypnotic medications. Although hypnotics may temporarily relieve symptoms, they also affect sleep architecture and can cause a deterioration in sleep quality. Thus, a cycle of dependency and abuse can occur. For this reason, as well as the lack of evidence regarding their safety and efficacy in the elderly, pharmacological interventions may not be the most appropriate choice of treatment for insomnia.

Sleep hygiene should be the first intervention for anyone with insomnia, regardless of age. Additional treatments or interventions should be selected based on the cause and duration of insomnia. For example, insomnia associated with a psychological origin, such as depression or anxiety, is best treated with antidepressants or anxiolytics. If the insomnia is of recent onset, short-term benzodiazepines are best for transient symptoms. When insomnia is "learned" and this maladaptation interferes with the initiation of sleep, behavioral interventions like biofeedback may also be effective. Iatrogenic insomnia often occurs in nursing homes and hospitals. In this situation, nursing-care providers may need education about sleep hygiene procedures and how to reduce environmental factors and care routines that interfere with the sleep of their patients.

Snoring and Sleep Apnea

Obstructive sleep apnea (OSA) is a condition involving intermittent pharyngeal obstruction that causes repetitive apneas and oxygen desaturation. In OSA, it is necessary for the patient to awaken to restore upper-airway patency and for breathing and airflow to resume. By definition, OSA is diagnosed when these events occur at a rate greater than five apnea events per hour of sleep. Additional symptoms for OSA include snoring, gasping, daytime sleepiness, and impaired daytime functioning. However, it is not uncommon for patients with severe symptoms to experience multiple awakenings in one night, severely fragmenting sleep and reducing both restorative sleep (stages 3 and 4) and REM sleep, which are necessary for healthy mental and physical functioning. Among individuals older than age 65, as many as 24% have sleep apnea, predominantly the obstructive type (Ancoli-Israel, Kripke, & Mason, 1987). Sleep apnea is both an age-related and an age-dependent condition, with an overlap in both distributions in the 60 to 70 age range (Bliwise, 2005). In particular, OSA symptoms, including witnessed apneas, snoring, snorting, and gasping, have been identified in 24% of independently living elderly (i.e., older than 65 years), 33% of aged acute-care inpatients, and 42% of nursing-home residents (Ancoli-Israel et al., 1987). Other symptoms of OSA include morning headache, dry mouth from mouth-breathing during sleep, sexual dysfunction, and nocturia. Although some attribute the nocturia to benign prostatic hypertrophy, OSA causes polyuria in both men and women (Umlauf et al., 2004).

Treatment for OSA depends on the contributing pathology and on patient preference. Treatment options include nocturnal nasal continuous positive airway pressure (CPAP), surgical procedures (palatoplasty) to reduce airway encroachment, oral appliances, and weight reduction when obesity is a contributing factor. Although CPAP is currently the most effective treatment for OSA, producing improvements in neurobehavioral performance, daytime sleepiness, snoring, and quality of life, it must be worn all night, every night in order to have maximal efficacy. Oral appliances can be effective in treating OSA; they work by pulling the jaw forward so that the tongue will not occlude the airway. Oral appliances require stable dentition; therefore, older persons with OSA should consult their dentists whether they are appropriate candidates for an oral appliance.

Restless Leg Syndrome and Periodic Leg Movements

Two neuromuscular dysfunctions that can cause EDS in the elderly are restless leg syndrome (RLS) and periodic leg movements (Montplaisir, Allen, Walters, & Ferini-Strambi, 2005). RLS is characterized by an almost irresistible urge to move the limbs, usually associated with disagreeable presleep leg sensations. These sensations often interfere with initiating and maintaining sleep, resulting in daytime sleepiness. As a secondary condition, RLS may be caused by iron-deficiency anemia, uremia, neurological lesions, diabetes, Parkinson's disease, rheumatoid arthritis, and certain drugs (e.g., tricyclics, selective serotonin reuptake inhibitors, lithium, dopamine blockers, and xanthines). Periodic leg movements, also known as nocturnal myoclonus, are flexions of the leg and foot that may disrupt sleep. Although the cause and associated mechanism of this chronic condition are not well defined, these movements have been linked to metabolic, vascular, and neurological causes. Both conditions may be treated with benzodiazepines, levodopa, and mild opiates, but their efficacy for long-term treatment has not been extensively evaluated.

EILEEN R. CHASENS
MARY GRACE UMLAUF

See also
Daytime Sleepiness

Internet Resources
American Academy of Sleep Medicine
http://www.aasmnet.org/

National Center on Sleep Disorders Research
http://www.nhlbi.nih.gov/health/public/sleep/index.htm
http://www.nhlbi.nih.gov/health/prof/sleep/index.htm

National Sleep Foundation
http://www.sleepfoundation.org/

New Abstracts and Papers in Sleep (NAPS)
http://www.websciences.org/bibliosleep/NAPS/

Restless Leg Syndrome Foundation
http://www.rls.org/

REFERENCES

Ancoli-Israel, S., Kripke, D. F., & Mason, W. (1987). Characteristics of obstructive and central sleep apnea in the elderly: An interim report. *Biological Psychiatry*, *22*(6), 741–750.

Bliwise, D. L. (2005). Normal Aging. In M. H. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th Ed., pp. 24–38). Philadelphia: W. B. Saunders.

Borbely, A., & Achermann, P. (2005). Sleep homeostasis and models of sleep regulation. In M. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th Ed., pp. 405–417). Philadelphia: Elsevier Saunders.

Montplaisir, J., Allen, R. P., Walters, A. S., & Ferini-Strambi, L. (2005). Restless leg syndrome and periodic limb movements during sleep. In M. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th Ed., pp. 839–852). Philladelphia: W. B. Saunders.

Umlauf, M.G., Chasens, E. R., Greevy, R. A., Arnold, J., Burgio, K. L., & Pillion, D. J. (2004). Obstructive sleep apnea, nocturia, and polyuria in older adults. *Sleep*, *27*(1), 139–144.

SMELL

See
Sensory Change/Loss: Smell and Taste

SOCIAL ISOLATION

The term *isolation* has diverse meanings in the gerontological literature. Social isolation generally denotes an absence of social interaction, contacts, and relationships with family, friends, neighbors, and society (Kahana, 2001). Age-related changes such as widowhood, retirement, and family dispersion have created the popular view of the elderly as more isolated than the general population. However, total social isolation, or the absence of social contacts, interaction, and social support networks, is relatively rare among the elderly. Studies indicate that the mean size of an older person's social network is five to seven people, predominantly family (Bowling, 1994) and that only 4% of the elderly report extreme isolation (Kahana, 2001). More frequent is emotional isolation due to the loss of a partner or close friends or relocation. Furthermore, some elderly have a lifelong history of withdrawal and may have personality traits that foster a solitary existence. Nonetheless, evidence suggests that the size of social networks decreases over time and that the documented decrease in social interaction experienced by older people is involuntary (Dunkle & Jeon, 2006).

The theory of socioemotional selectivity posits that older people narrow their range of social partners and are more likely to choose long-term friends and loved ones for social interaction; having positive emotional experiences is more important than other motives such as information-seeking or self-definition. With a smaller network, elders can conserve physical and cognitive resources, freeing time and energy for selected social relationships.

Research on the connection between social relations and well-being supports the everyday understanding of the important social, psychological, and behavioral functions of human interaction. Exactly how and why social relationships influence well-being are not understood; however, research supports a consistent and enduring relationship between social isolation and poor physical and mental health (Stuart-Shor, Carroll, & Forman, 2003) and clearly there are reciprocal effects of health on social interaction and isolation.

Studies since the 1980s indicate that people with strong social relations have lower morbidity and mortality, including a better possibility of recovery after illness (Seeman, 2000). Research documenting poorer cardiovascular health among socially isolated individuals continues to underscore the importance of providing interventions to these individuals, who are also more likely to have depression and difficulty with health care compliance. Greater frequency of emotional support from social networks, particularly among those reporting low frequency of instrumental support, has produced a favorable impact on functional outcomes. Social connectedness has also been linked to emotional well-being, with studies showing that the quantity and quality of relationships are significant predictors of depressive symptoms in middle-aged and older patients. Conversely, low levels of social activity and social contacts are associated with poor functional outcomes. Studies of the negative aspects of social relationships underscore that social relationships of a conflictual or negative nature can adversely affect health (Seeman, 2000).

Changes associated with aging can result in reduced contact between older adults and family, friends, and associates. Death of a spouse or other family members, hearing and vision limitations, decline in mobility, residential relocation, and loss of social roles are factors that may singly or in combination place an older person at increased risk for social isolation. Populations at particular risk include caregivers, including grandparents raising grandchildren, as well as poor elders and older adults with limited language proficiency. The tendency is to assume that living alone, being single, or not having a family necessarily implies social isolation; however, studies find that older women, in particular, are able to receive help and emotional support from both old and new relationships and that immigrant elders living in geographic proximity to their ethnic community avoid social isolation. It is more likely that the interaction of multiple changes and losses, rather than bereavement alone, places older adults at greater risk of isolation (Hooyman & Kiyak, 2004).

The relationship between social isolation and elder abuse, neglect, and mistreatment has received a lot of attention. Both self-neglect and abuse by family are most likely to occur when the patient has dementia or late-life depression, conditions that impose relatively high psychological and physical burdens on caregivers. Social isolation also can be a strategy for keeping abuse secret. Elders who are homeless, have a history of chronic mental illness or substance abuse, and live in inner-city neighborhoods are also at high risk for social isolation (Kahana, 2001).

Assessment

Overall social functioning and identification of barriers to interaction with others must be assessed. Health care practitioners from multiple disciplines are critical links in identifying and addressing social isolation in older adults, including attention to possible root causes such as sensory impairment, compromised mobility, and clinical depression. When social isolation is unrecognized, opportunities are missed to improve physical and mental health and prevent abuse, depression, or other adverse outcomes. As in all client assessments, a relatively simple initial screening can lead to more complex secondary and tertiary strategies. Paraprofessional case managers and case aides may screen the client to determine the existence or absence of social support. Practitioners with more clinical training can then explore the dynamics of any support system's strengths and weaknesses and pursue necessary social intervention. Among the best-known measures of social functioning is the Older Adult Resources and Services (OARS) Social Resource Scale, part of the larger OARS battery (Kane & Kane, 2000). OARS addresses social parameters such as marital status, circle of friends, frequency of contact, presence of a confidant, and possibility and level of social support in the future. Assessors must be aware that clients may overestimate the quality or quantity of relationships for a variety of reasons, including wishful thinking, protection of family members, pride, and feeling that something besides the truth is the desired response. Likewise, older adults caring for dependent populations may be reluctant to acknowledge their isolation from activities or lack of adequate support. Careful assessment is needed to address this high-risk population.

Prevention and Interventions

Important prevention strategies include education of the general population, but especially older people and family caregivers, about the importance of remaining socially engaged through all avenues, from telephone visitation to active participation in organizations. Addressing social isolation also requires social policies and programs that promote social exchange and interaction. In the process of facilitating or providing services, communities need to consider the diversity of their older residents, including differences in race, cultural background, socioeconomics, home settings, and general functioning. Many communities have a comprehensive network of senior centers, opportunities for volunteerism, and recreational activities; however, they may not be user-friendly for elders who are frail, belong to ethnic minorities, or require specialized transportation. The physical design of both private homes and communal environments (e.g., community centers and senior housing) can promote or impede communication between friends, participation in recreational activities, or vicarious enjoyment through watching others. Practitioners need to develop individualized "social prescriptions" to ensure that older adults have the physiological ability to contact and communicate with others, other people with whom to interact, opportunities for meaningful interaction, and the motivation or desire to interact. Specific plans may involve introducing effective aids for vision or hearing deficits, treating clinical depression, modifying homes for access, helping with transportation, and securing referrals to self-help or support groups or to community social or educational programs with peers.

In addition to this direct approach, practitioners should avoid reducing an elder's opportunity for social activity and meaning by overemphasizing health and safety issues. Family caregivers of dependent older adults may experience stress and require assistance in planning ways to enrich the lives of elderly relatives and alleviate stress.

Daily Physical and Emotional Care

Although research is limited, participation in adult day-care programs and self-help and support groups and individual peer-support programs appears to be beneficial in preventing isolation of older adults and family caregivers and, therefore, may shield against elder abuse (Stuart-Shor et al., 2003). Outcomes of self-help bereavement programs found that participants experienced fewer depressive symptoms, recovered their activities, and developed new relationships more quickly than those without such support.

Older individuals with a lifelong history of isolation and those who have no children or spouse are more likely to depend on the active assistance of social agencies and mental health services. Elders may not always welcome outside assistance, fearing loss of control or denying the need for help. Effective formal outreach programs require carefully trained personnel to overcome this resistance. Cases of social isolation due to self-neglect or abuse require referral to the state-designated programs serving abused and neglected elders.

Technology's role in decreasing social isolation is a recent phenomenon; however, early research demonstrates that the Internet (electronic mail and the World Wide Web) may provide new opportunities for communication that can help older adults avoid social isolation. There are several senior and caregiver sites on the Web; however, this rapidly expanding communication and information link is not readily available or used by all older adults, and research needs to determine more precisely which older adults, residing in which environmental contexts, are more likely than others to benefit.

Given the increasing likelihood of disability in later life, helping older adults maintain or establish meaningful social ties and avoid social isolation is critical in helping them maintain their independence and overall well-being.

NANCY L. WILSON

See also

Bereavement
Caregiving Relationships
Coping With Chronic Illness
Elder Mistreatment: Overview
Relocation Stress
Senior Centers
Support Groups

Internet Resources

Administration on Aging:
http://www.aoa.gov/eldfam/Service_Options/Service_Options.asp

American Association of Retired Persons
http://www.aarp.org/

Family Caregiver Alliance
http://www.caregiver.org/caregiver/jsp/home.jsp

National Council on the Aging
http://www.ncoa.org/index.cfm

National Center on Elder Abuse
http://www.elderabusecenter.org/

REFERENCES

Bowling, A. (1994). Social networks and social support among older people and implications for emotional well-being and psychiatric morbidity. *International Review of Psychiatry*, *6*, 41–58.

Dunkle, R. D., & Jeon, H-S.,(2006). The oldest old. In B. Berkman (Ed.), *Handbook of social work in health and aging*. New York: Oxford University Press.

Hooyman, N. R., & Kiyak, A. (2004). *Social gerontology: A multidisciplinary perspective* (7th ed.). Boston: Allyn & Bacon.

Kahana, B. (2001). Isolation. In G. L. Maddox (Ed.), *The Encyclopedia of aging* (3rd ed.). New York: Springer Publishing Company.

Kane, R. A., & Kane, R. L. (2000). *Assessing older persons*. New York: Oxford University Press.

Seeman, T. E. (2000). Health-promoting effects of friends and family on health outcomes in older adults. *American Journal of Health Promotion*, *14*, 362–370.

Stuart-Shor, E. M., Buselli, E. F., Carroll, D. L., & Forman, D. E. (2003). Are psychosocial factors associated with the pathogenesis and consequences of cardiovascular disease in the elderly? *Journal of Cardiovascular Nursing*, *18*, 169–183.

SOCIAL SECURITY

The national pension system of the United States is officially called Old-Age, Survivors, and Disability Insurance (OASDI). The general term *Social Security* is used to describe this program.

The Social Security Act of 1935 initially provided monthly benefits only to retired workers age 65 and older. Starting in 1956 in the case of women and in 1961 in the case of men, Congress permitted eligible workers to claim actuarially reduced retirement benefits between ages 62 and 64. “Auxiliary” Social Security benefits are provided to the eligible dependents of Social Security pensioners. Disability insurance benefits were added to Social Security in 1956. In 1983, the normal retirement age was raised for workers born in 1938 and later years. It will increase gradually from age 65 to 67, beginning in 2003. The normal retirement age will reach 67 in 2027 for workers born in 1960 and later years. The early retirement ages will not change, but the benefit reductions for claiming an early pension will be larger percentages of the worker’s primary insurance amount.

The benefit formula provides a pension increase, known as a delayed retirement credit, for workers who defer claiming a pension until after the normal retirement age. For workers who attained the normal retirement age before 1990, the increase was 3% of the PIA per year of delay. For those who reached the normal retirement age in 1990 and later, the increases became progressively larger. The delayed retirement credit reaches 8% per year of delay for workers attaining age 66 in 2009 and later years.

Eligibility for benefits depends on having the required number of earnings credits. In 2006, a credit is given for each $970 of earnings, up to a maximum of four credits per year. For retirement and survivor benefits, no more than 40 credits are required for benefit eligibility. To qualify for disability benefits, disabled workers must ordinarily have 20 credits in the last 10 years. The amount of earnings required for a credit is increased from year to year in proportion to the percentage change in economy-wide average wages.

Income Taxation of OASDI Benefits

Beginning in 1994, OASDI benefits became taxable for some taxpayers who had incomes above these thresholds. Up to 85% of OASDI benefits are considered taxable income for income-tax purposes for single people with incomes above $34,000 a year and married couples with incomes above $44,000 a year. Unlike many elements of the OASDI program, the threshold amounts used to calculate income-tax liabilities on Social Security benefits do not change in line with either prices or economy-wide average wages. In most states, OASDI benefits remain exempt from state and local income taxes.

Financing OASDI

Income flowing into the Social Security system is deposited into two reserve funds: the Old-Age and Survivors Insurance (OASI) Trust Fund and the Disability Insurance (DI) Trust Fund. The benefits and administrative expenses of the OASDI program are paid out of these trust funds. The income of the trust funds consists of payroll tax revenues, interest earnings on trust fund investments and, since 1984, most of the receipts collected from imposing income taxes on OASDI benefits.

From the inception of Social Security until the 1980s, the basic financing concept of OASDI rested on the idea that the program should be supported from scheduled payroll taxes and investment income earned on reserves. Congress sometimes made exceptions to this rule, using general revenues to pay for benefits to some old people would not otherwise qualify for them. The 1983 amendments introduced general revenue financing in an indirect way. Since 1984, the Social Security program has derived part of its revenues from income taxes imposed on OASDI benefits.

By law, the reserves held in the trust funds must be invested in securities guaranteed as to principal and interest by the federal government. As a practical matter, the reserves have been almost entirely invested in U.S. Treasury securities. Congress has never seriously considered allowing investments in private securities, which might provide the trust funds with a better rate of return, although one that is subject to greater year-to-year variability. Congress has not wanted to be drawn into a debate over defining an appropriate mix of public and private securities that are suitable for trust-fund investment.

Problems Facing Social Security

In the early 1980s, the OASDI system faced both short- and long-term financing problems. The balance in the OASI trust fund was falling rapidly and would have been exhausted if Congress had not enacted legislation that permitted inter-fund borrowing. At the same time, the Social Security Actuary estimated that expected program outlays in the next 75 years would be significantly higher than anticipated income.

The long-term problem was the more serious one. Declines in the U.S. birth rate and increases in Americans' life span have gradually increased the ratio of Social Security beneficiaries to Social Security payroll taxpayers. The ratio of beneficiaries to taxpayers will rise sharply after 2010 when the post–World War II baby boom generation begins to retire. The change in the ratio of beneficiaries to contributors would pose no special problem if Social Security were financed on a purely advance-funded basis. In that case, future benefits would be paid out of the accumulated reserves of the system and future taxpayers would face only small tax increases associated with gains in their longevity compared with earlier generations. However, the reserves built up in the Social Security trust funds were comparatively small in the early 1980s. Nearly all of the payroll tax contributions collected through 1983 had been paid out as benefits or used up in administering the system. In the absence of a large financial reserve, the rapid increase in the expected number of pensioners beginning in 2010 would force Congress to either raise payroll taxes or cut pension payments to keep the program solvent.

The unfavorable actuarial forecast does not mean that OASDI is doomed to collapse. Rather, Congress can gradually make a sequence of small changes in the program that would prevent this from occurring. For example, benefit costs can be reduced over the long run by speeding up and extending the increases in the normal retirement age that were put into law in 1983. Similarly, small and gradual increases in the OASDI tax rate can be phased in before the trust-fund reserves are exhausted.

Administration of OASDI

The OASDI program is administered principally by the Social Security Administration (SSA). In 2005, the cost of administering the program was 1.0% of total benefit payments and 0.8% of OASDI income. Before April 1995, the SSA was part of the Department of Health and Human Services, but since that time it has been an independent agency. The U.S. Department of Treasury collects OASDI payroll taxes, manages the OASDI trust funds, and prepares monthly benefit checks. Determinations of worker disability are made by state agencies, usually a state vocational rehabilitation agency.

Possible Future Developments in Social Security

It seems unlikely that significant benefit changes will be made in the OASDI program in the next few years unless the change is part of a broad package to resolve the long-range financing problems. Two kinds of changes have been widely discussed in recent years: means-testing Social Security benefits and privatizing part or all of the Social Security system.

Critics of Social Security believe it is too costly. Even if the program is affordable today, many believe it will become unaffordable after the baby boom generation is fully retired in 2030. To make the program more affordable, some people propose means-testing benefits by reducing or eliminating the benefits paid to high-income retirees. This proposal can be viewed from several perspectives. The United States is one of a handful of the richest countries in the world. Yet, in comparison with the public retirement systems of other rich countries, the U.S. Social Security program provides below-average replacement rates, especially to workers who earn high wages throughout their careers (OECD, 2005). As a result, the United States spends a smaller proportion of its national income on public pensions than other rich countries, and this is likely to remain true even when the baby boom generation is fully retired (Bosworth & Burtless, 1998).

One objection to means-testing OASDI benefits is that it discourages workers from saving for their own retirement, either in employer-sponsored pension plans or in personal savings accounts. When workers know they cannot obtain Social Security benefits if they receive non-OASDI income above a threshold amount, say, $20,000 a year, some middle-income workers may refrain from saving in their own behalf. In a sense, the redistributive formula for OASDI benefits already accomplishes one goal of means-testing by limiting the wage-replacement rates available to workers who have high lifetime earnings. As noted previously, the OASDI benefit formula provides monthly pensions that are more generous in relation to earnings for low-wage than for high-wage workers. In addition, retired workers who have high retirement incomes also have a bigger percentage of their OASDI benefits included in taxable income. Taxing benefits is redistributive because marginal and average income-tax rates rise with household income.

Congress has never subjected OASDI benefits to a straightforward means test. In adopting and consistently following this principle, Congress almost certainly raised the long-term cost of Social Security, but it also increased the program's political acceptability and appeal. Social Security is widely regarded as a middle-class program, one that provides benefits to the middle-income and affluent elderly as well as to the poor. The link between workers' OASDI contributions and benefits encourages contributors to regard their Social Security benefits as an earned right. If a large percentage of workers was required to contribute to the program but was then denied benefits in old age, the program's broad political appeal would suffer.

Starting in the mid-1990s, many proposals were offered with the goal of privatizing Social Security, in whole or in part. A privatized pension system is one in which workers build up their own retirement savings in an account over which they exercise some control. With restrictions, they would be able to invest their savings as they chose, and they would have to pay for part or all of their retirement consumption out of funds accumulated in their accounts.

One reason that Social Security critics favor privatization is their view that workers could obtain a better rate of return on their contributions if they were placed in a private account. This view is partly true, but it is misleading. It is true that individual workers can find investment opportunities that offer better expected returns than their contributions to Social Security. However, a large percentage of current OASDI contributions is used to pay for current benefit payments. Only a small portion of current payroll taxes is available for investment in financial markets. The part of OASDI contributions actually available for investment is invested in U.S. Treasury securities. Collectively, workers can obtain somewhat better returns than those available on Treasury securities, but higher returns would also require workers to accept greater risk that the investments would sometimes perform poorly. The only way workers can collectively obtain a significantly higher return on their OASDI contributions is to reduce OASDI payments to current retirees, which would free up more of their contributions for immediate investment. However, no serious proponent of privatization suggests that the government should immediately and substantially cut benefits to workers who are already retired. If the benefits of current retirees are fully protected and if the total contribution rate for retirement programs remains unchanged, privatization could at best produce a very small improvement in the return on workers' contributions.

The debate over privatization is in essence a debate over the proper division of responsibility for financing Americans' retirement and managing the risks associated with pension financing. The traditional Social Security system provides a government guarantee of a modest retirement income that is scaled in proportion to a worker's previous earnings. Workers who wish to obtain a more comfortable standard of living when they retire must save on their own or find jobs with employers who offer good pensions. The SSA estimates that about 40% of the money income received by Americans 65 and older is derived from OASDI benefits (U.S. Social Security Administration, 2005). Almost all of the remainder is derived from private income sources, including employer-sponsored pensions, current earnings, and investment income from personal savings. During the 7 decades up through 2006, the government-guaranteed Social Security pension has provided reliable income protection in old age. The pension is largely protected against the risk of inflation, and it lasts as long as the retired worker or the worker's dependent spouse continues to live.

Occupational pensions and personal savings accounts offer less protection. Employer-sponsored pensions are only rarely increased in line with inflation after a worker retires. This poses important risks to workers who live for many years after they begin collecting a pension. Retirement consumption that can be financed out of a personal savings account depends on workers' ability to save consistently and to invest prudently. Even a worker who meets these challenges may be unlucky in reaching retirement age at a time when financial markets are in turmoil or inflation is high. A worker who does not convert personal savings into an annuity may be "unlucky" in living a very long life, possibly exhausting his or her retirement savings. A sensibly designed privatization plan can reduce some of these risks. For example, if a fixed percentage of every paycheck is automatically deposited in a worker's retirement account, workers would face little risk of reaching old age with an empty savings account. If workers' investment alternatives were tightly restricted, if workers were offered an investment alternative with a minimum guaranteed rate of return, and if workers were compelled to convert some of their pension savings into an inflation-protected annuity when they retired, there is less risk that retirees would suffer serious deprivation.

Social Security faces an uncertain future. All plausible long-term forecasts suggest the program will eventually begin to pay out more benefits than it collects in taxes and earns on its investments. Once benefit payments begin to exceed revenues, the difference between outgo and income will steadily rise until the trust-fund reserve is exhausted. When this occurs, probably within the next 4 decades, the program will only collect enough payroll taxes to pay for 75% of currently promised benefits.

Not surprisingly, the public now has less confidence in the program than it had in the 1960s, when the financial future of the system seemed secure. At the beginning of the 21st century, many Americans lacked confidence that the OASDI program would still exist and be capable of paying retirement benefits in the future. The nation's experience during the first 7 decades of Social Security demonstrates, however, that the program is highly adaptable. Successive Congresses and Administrations have made timely adjustments in the program to reflect changing demographic, economic, and political conditions. For this reason, it seems likely that Social Security in some form will endure.

GARY BURTLESS

See also

Medicaid
Medicare
Pensions and Financing Retirement

Internet Resource

U.S. Social Security Administration
http://www.ssa.gov

REFERENCES

Bosworth, B., & Burtless, G (1998). *Aging societies: The global dimension*. Washington, DC: Brookings Institution.

OECD (2005). *Pensions at a glance: Public policies across OECD countries, 2005 Edition*. Paris: OECD.

U.S. Social Security Administration (2005). *Income of the Population 55 or Older, 2002*. Washington, DC: Social Security Administration.

SOCIAL SUPPORTS (FORMAL AND INFORMAL)

Demographic trends suggest that both informal and formal support to the elderly will be of increased importance in the future. The growing elderly population is quite heterogeneous, with those elderly who are poor or in ill health most at risk for a lack of social support.

The population of Americans aged 65 years and older, currently 12% of the total population, is anticipated to increase rapidly in coming decades such that by 2030, it will represent 20% of the U.S. population (He, Sengupta, Velkoff, & DeBarros, 2005). Although the overall rates of elderly poverty in the United States have been declining, there are considerable differences in the rates of poverty among subgroups of elderly persons. For example, the poverty rate for elderly individuals who live alone is almost double the poverty rate for elders overall, whereas the poverty rate for Black elderly and elders of Hispanic origin is more than twice has high as the poverty rate for White elders (U.S. Census Bureau, 2004).

Informal social support is provided to the elderly by family members, friends, neighbors, clergy, and coworkers. Formal support is the broad array of social service, welfare, health, and mental health services.

Informal Support Systems: Burdens and Gratifications

Family members provide extensive support to the elderly and represent the elderly's most significant social resource (Johnson & Wiener, 2006). Adult children provide substantial amounts of support, with children of frail elders assuming an even larger share of activities necessary to meet the elder's care needs. Noninstitutionalized elderly receive most medically related personal care services from their children.

Friends and neighbors are also significant providers of social support for the elderly because of their physical proximity. Community groups and associations are important to the well-being of the elderly, even though elders participate to a lesser degree than other age groups. Most participation in voluntary organizations by the elderly is church- or synagogue-related.

A small but significant number of the elderly population is socially and physically isolated, with few if any significant others to turn to for help and assistance. These elderly are at greater risk for health and mental health problems and are at greater risk for institutionalization. Formal care providers must assess the needs of this at-risk population group and provide or arrange for the needed formal supports.

Many families report that caregiving is an emotional, physical, and, at times, financial burden that can impact caregivers' physical health as well as increase the risk of caregiver mortality (Pinquart & Sorensen, 2003). Care-recipient behavioral problems and caregiver burden may be a major factor in the decision to institutionalize an elderly parent.

There has been increasing attention to the role of race and ethnicity in caregiving, with a recent review finding no support for the previously held belief that minority caregivers receive more help from their family members and friends than do non-Hispanic caregivers. In addition, there was only partial support for the assertion that caregiving has more negative impacts among White than among African American caregivers (Dilworth-Anderson, Williams, & Gibson, 2002).

It is also been noted that caregiving can have positive aspects for the caregiver as well, although this research has been far more limited than examinations of the costs of caregiving. Caregivers report satisfaction, enjoyment, and benefits and rewards from caregiving.

For informal support systems to be most effective, linkages are needed among family caregivers, neighbors, friends, clergy, and other helpers. However, this often does not occur due to the fragmentation of helping networks.

Barriers to the Use of Formal Services

Studies of service-utilization patterns indicate that many older people eligible for service programs, especially racial and ethnic minorities, do not use them. A variety of barriers to the use of health, mental health, and social services by at-risk older people has been identified in the literature (Biegel & Leibbrandt, 2006). These barriers are often the greatest for elders in poverty, minority elderly, those with physical or mental disabilities, and those whose service needs span both the aging network and other more specialized service-delivery systems.

Effective interventions to address the needs of the elderly who may be underutilizing formal services must define the barriers and identify their locus or source. The latter is especially important, as strategies to address these barriers must be tailored to their specific locus in order to be most effective. Barriers can be conceptualized on system, staff, community, or individual levels (Biegel & Leibbrandt, 2006).

System-level barriers refer to deficits at the service agency and at the agency network level that are impacted by political, economic, and social forces that shape the development of agency services and funding for such services. Such barriers include availability and cost, availability of transportation, hours of service, auspices of service, provision of information about services to potential referral agents and users of services, appropriateness of services, and linkages with formal and informal service systems and providers.

Staff-level barriers are the levels of knowledge, skills, attitudes, and behaviors of agency staff. Such barriers include lack of knowledge of specific problems and needs of subgroups of older people, negative attitudes by professionals about aging, and lack of culturally competent staff (Burggraf, 2000).

Community-level barriers refer to negative attitudes and behaviors toward professional service use by informal helpers and community-based organizations. Such barriers include lack of knowledge of agency services by informal helpers, lack of relationships between informal helpers and agency service providers, and unwillingness to recognize problems of the elderly (Biegel & Leibbrandt, 2006).

Individual-level barriers refer to personal and family attitudes and behaviors toward service use. These barriers include lack of knowledge about services in general; not understanding how services can be helpful and not knowing where to go for help with specific problems or issues; negative attitudes toward formal services and unwillingness to accept help; and the role of family members in discouraging or preventing service use. Other barriers relate to the health status characteristics of the elderly and may include health problems such as chronic illness or physical-mobility problems and activity restrictions (Dancy & Ralston, 2002).

Strengthening Support Systems of the Elderly

To strengthen support systems of the elderly, a multidimensional approach targeting all four barrier levels presented previously—system, staff, community, and individual/family—is required. One of the greatest barriers to service delivery, affecting in particular at-risk elderly—for example, the poor, older women, racial and ethnic minorities, and the rural elderly—is the lack of knowledge about the problems and needs of elders, at both the system and staff levels. This barrier is significant because it contributes to the development and delivery of services that do not adequately meet the needs of this population. A second barrier at the staff level involves the provision of services by professionals who lack the specialized knowledge and skills needed to attend to the needs of at-risk older adults.

Strengthening the informal and formal social networks of at-risk elderly persons requires a thorough psychosocial assessment and a specific focus on the strengths and weakness of the elderly individual's informal and formal social support systems. Specific attention should be given to unmet needs and elders whose support systems are adequate at present but have a tenuous future.

David E. Biegel

See also
Caregiver Burden
Caregiver Burnout
Caregiving Relationships
Cultural Competence and Aging
Family Care for Frail Elders
Family Caregiver Needs: Assessment

Internet Resource
National Alliance for Caregiving
www.caregiving.org

REFERENCES

Biegel, D. E., & Leibbrandt, S. (2006). Social work practice with elders living in poverty (pp.167–180). In B. Berkman & S. Ambruoso (Eds.), *Handbook of social work in health and aging*. New York: Oxford University Press.

Burggraf, V. (2000). The older woman: Ethnicity and health. *Geriatric Nursing*, *21*(4), 183–187.

Dancy, Jr., J., & Ralston, P. (2002). Health promotion and Black elders. *Research on Aging*, *24*(2), 218–242.

Dilworth-Anderson, P., Williams, I. C., & Gibson, B. E. (2002). Issues of race, ethnicity and culture in caregiving research: A 20-year review (1980–2000). *Gerontologist*, *42*(2), 237–272.

He, W., Sengupta, M., Velkoff, V. A., & DeBarros, K. A. (2005). *U.S. Census Bureau Current Population Reports, P23-209. 65+ in the United States, 2005*. Washington, DC: U.S. Government Printing Office.

Johnson, R. W., & Wiener, J. M. (2006). *A profile of frail older Americans and their caregivers*. The Retirement Project, Occasional Paper Number 8. Washington, DC: The Urban Institute.

Pinquart, M., & Sorensen, S. (2003). Differences between caregivers and non-caregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging*, *18* (2), 250–267.

U.S. Census Bureau (2004). Current population survey, 2004. *Annual social and economic supplement*.

SPEECH-LANGUAGE PATHOLOGISTS

Scope of Practice

Speech-language pathologists (SLP), sometimes called speech pathologists (SP) or speech therapists (ST), are specialists in the prevention, diagnosis, and treatment of communication, swallowing, or other upper-aerodigestive disorders; elective modification of communication behaviors; and enhancement of communication. As individuals age, normal changes may occur in their swallowing, speech, language, or cognitive skills. In addition, the chances of having a stroke or developing dementia or Parkinson's disease increase, as do the chances of acquiring a communication or swallowing disorder related to these diseases. SLPs play an important role in working with the aging population by assisting in the differentiation between normal aging and disordered communication or swallowing function and by providing vital services to those individuals who do have disorders.

As primary care providers for communication and related disorders, SLPs are autonomous professionals; that is, their services need not be prescribed or supervised by individuals in other professions. However, patients are best served when professionals work collaboratively. During the diagnostic process, SLPs choose the appropriate tests and instruments to diagnose the extent of impairment and track changes over time; communicate test results to patients, caregivers, and other clinicians; and create an individualized treatment plan projecting the short- and long-term goals of treatment, as well as the number and length of sessions. Education and counseling are critical aspects of speech therapy to help patients and their families cope with stress and frustration due to changes in abilities.

Overall, the scope of speech-language pathology practice involves the following:

1. Providing prevention, screening, consultation, assessment and diagnosis, treatment, intervention, management, counseling, and follow-up services for disorders of:
    - speech (i.e., articulation, fluency, resonance, and voice, including aeromechanical components of respiration)
    - language (i.e., phonology, morphology, syntax, semantics, and pragmatic/social aspects of communication), including comprehension and expression in oral, written, graphic, and manual modalities; language processing; preliteracy and language-based literacy skills
    - swallowing or other upper-aerodigestive functions
    - cognitive aspects of communication (e.g., attention, memory, problem solving, executive functions)
    - sensory awareness related to communication, swallowing, or other upper-aerodigestive functions
2. Establishing augmentative and alternative communication techniques and strategies including developing, selecting, and prescribing such systems and devices (e.g., speech-generating devices).
3. Providing services to individuals with hearing loss and their families and caregivers (e.g., auditory training; speech-reading; speech and language intervention secondary to hearing loss; visual inspection and listening checks of amplification devices).

4. Screening hearing of individuals who can participate in conventional pure-tone air-conduction methods, as well as screening for middle-ear pathology through screening tympanometry for the purpose of referring individuals for further evaluation and management.
5. Using instrumentation (e.g., videofluoroscopy, EMG, nasendoscopy, stroboscopy, and computer technology) to observe, collect data, and measure parameters of communication and swallowing, or other upper-aerodigestive functions in accordance with the principles of evidence-based practice.
6. Selecting, fitting, and establishing effective use of prosthetic/adaptive devices for communication, swallowing, or other upper-aerodigestive functions (e.g., tracheoesophageal prostheses, speaking valves, and electrolarynges).
7. Collaborating in the assessment of central-auditory-processing disorders and providing intervention where there is evidence of speech, language, and/or other cognitive-communication disorders.
8. Educating and counseling individuals, families, coworkers, educators, and other persons in the community regarding acceptance, adaptation, and decision making about communication, swallowing, or other upper-aerodigestive concerns (ASHA, 2001).

Licensure and Certification

In 2004, there were approximately 96,000 SLPs in the United States, almost half in schools and colleges or universities. Others were employed in hospitals, offices of other health practitioners, nursing-care facilities, home-health-care services, outpatient-care centers, private practice, and child day-care centers. SLPs are licensed in 47 states and require at least a master's degree for practice in health care settings. Continuing education units (CEUs) are mandatory in 41 states to retain licensure. SLPs must also earn and maintain national certification (i.e., Certificate of Clinical Competency) administered by the American Speech-Language-Hearing Association (ASHA). Applicants for the certificate are required to pass a national exam in speech-language pathology, complete 400 hours of supervised clinical experience, and complete a 36-week postgraduate clinical fellowship, an important transitional phase between the supervised graduate-level practicum and independent delivery of services. Demonstration of continued professional development is mandated for maintenance of the Certificate of Clinical Competence in Speech-Language Pathology.

Approximately 240 colleges and universities have graduate programs in speech-language pathology that are accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology. As SLPs gain clinical experience and engage in continuing professional education, many develop expertise with certain populations, such as geriatrics, or disorders, such as aphasia and swallowing disorders. Some may obtain board recognition in a specialty area.

SLP Assistants

SLP assistants perform tasks only as prescribed, directed, and supervised by SLPs. ASHA criteria for the registration of SLP assistants require that a candidate complete an associate's degree in an ASHA-approved SLP assistant training program. Assistants also must complete 100 hours of fieldwork experiences under the supervision of an ASHA-certified SLP. An SLP assistant cannot be employed without a supervising SLP, and many states limit the number of assistants an SLP may supervise and define the parameters of their activities. The need for such assistants varies by setting; more are needed in acute care than in institutional or residential care. An assistant can conduct speech-language screening, follow a treatment plan and document progress, assist with assessment, and perform other administrative tasks. Assistants are not permitted to perform standardized or nonstandardized diagnostic tests, formal or informal evaluations, interpret test results, counsel a client or family, or write or revise a plan of care.

Reimbursement

Medicare, Medicaid, and private health insurance usually require licensure for eligibility for reimbursement and a physician's order ("certification") for treatment. Private health plans may provide coverage for communication disorders pursuant to illness or accidents, but reimbursement might be limited to specific provider settings or only to licensed practitioners. Regardless of coverage type, the SLP must justify the benefit that the patient is expected to receive from short-term treatment in order to maintain coverage. Insurance payers, patients, and other medical professionals frequently question the research supporting various interventions. SLPs, like other professionals, must be aware of the principles of evidence-based practice and ensure that the provision of services is supported by the best available evidence.

SUZANNE ORR GRESLE

See also
Communication Issues for Practitioners
Dehydration
Eating and Feeding Behaviors
Feeding: Non-Oral
Oral Health Assessment
Swallowing Disorders and Aspiration

Internet Resources
American Speech-Language-Hearing Association
http://www.asha.org

Occupational Outlook Handbook, Bureau of Labor Statistics
http://stats.bls.gov/oco/ocos099.htm

REFERENCES

American Speech-Language-Hearing Association (2001). *Scope of practice in speech-language pathology*. Rockville, MD.

American Speech-Language-Hearing Association (2005). *ASHA SLP Health Care Survey 2005: Workforce*. Rockville, MD.

SPECIAL CARE UNITS

See
Dementia: Special Care Units

SPIRITUALITY

Recent scientific research positively correlates "well-being" with improved health status and encourages health-care providers to recognize and address the connection between spirituality and health in their patients (Miller & Thoresen, 2003). Health care professionals caring for elderly patients need to promote spiritual caregiving as older individuals grapple with social change (i.e., retirement; loss of friends, family, or partner), chronic or terminal illness, and/or quality-of-life issues.

In recent years, gerontologists have attempted to understand the degree to which older persons are involved in religious and spiritual practices and how they affect physical and mental health (Coleman, 2005). Although most research is descriptive, there appears to be a positive correlation between religion or religiosity and improved health status. One study of community-dwelling elders, for example, found that individuals who reported greater spirituality had higher perceptions of their overall health status than individuals with lower spirituality scores (Daaleman, Perera, & Studenski, 2004). Another study found a significant positive correlation between attendance at religious services and survival rates in older women (Teinonen, Vahlberg, Isoaho, & Kivela, 2005). Regular participation in religious activities among the elderly, such as attending weekly religious services, reading spiritual writings regularly, and engaging in routine prayer can also decrease blood pressure and depression (Koenig et al., 1998; Koenig, George, & Peterson, 1998).

Whereas many studies of spirituality and aging focus specifically on Judeo-Christian practices, others interpret spirituality more broadly to include religion, love and belonging, morality, and death and dying. Hungelmann, Kenkel-Rossi, Klassen, and

Stollenwerk (1996) developed the JAREL Spiritual Well-Being Scale after analyzing 31 in-depth interviews with older subjects about their spiritual well-being. Their work with older adults led them to define spirituality as a multidimensional construct encompassing broad dimensions of relationships with self and others as well as ties to past, present, and future events.

Understanding the link among patient spirituality, time, and relationship-building is important when assessing spirituality in older adults. Whether or not the elderly are formally affiliated with organized religion, older patients need to express their spiritual concerns and needs within the context of their life histories.

Despite this apparent logic, however, the spiritual needs of older adults are seldom addressed. Caregivers' failure to assess spiritual needs has been associated with numerous factors, including the ambiguous meaning of spirituality, provider discomfort with spirituality, patient reluctance to share spiritual concerns, and lack of clinical time to devote to patients' spiritual-care needs (Brush & Daly, 2000). Moreover, few practice models operationalize spiritual assessment and care into clinical practice or measure clinical outcomes of the older person's spiritual well-being. Attempts to quantify spirituality through pretested instruments measuring various parameters of spirituality have often been flawed or statistically insignificant. Nonetheless, many researchers and clinicians agree that spirituality is important to older adults and suggest that providers include spiritual assessment as part of routine practice. Nurse and social-work educators in particular are encouraged to prepare future nurses and social workers to incorporate spirituality into a holistic-care paradigm.

First, providers need to respect elders' religious or spiritual articles and practices that symbolize individual faith and values. Certain religiously based dietary restrictions or care philosophies, for example, may not coincide with Western medical thought but should be considered in a patient's overall care plan. Second, health care providers need to provide an atmosphere where expressions of spirituality are accepted and encouraged. Providers must also recognize that not all individuals express their spirituality within a religious framework and should encourage them to express their spirituality through other means, such as sharing life stories or personal perspectives on life meaning. Finally, providers could engage in spiritual practices with patients such as prayer, meditation, or healing modalities in accordance with their own degree of comfort. Providers need to explore their own spiritual perspectives and practices in order to offer adequate spiritual interventions in situations where they are most needed.

For many older people, religious commitment and a sense of spirituality are important aspects of how they age and how they approach the end of life. Future research in spirituality and aging must assess outcomes of spiritual care; explore the meaning of spirituality across diverse groups of elders; and demonstrate clear educational and practice goals for nurses, physicians, social workers, and others caring for older patients. Only then can health care providers understand how older adults, whether community-dwelling or institutionally based, experience the religious and spiritual dimensions of later life.

BARBARA L. BRUSH

See also
Subjective Well-Being

Internet Resources

Center for Religion, Spirituality, and Aging
http://www.aging-religion-spirituality.com

Forum on Religion, Spirituality, and Aging (FoRSA)
http://www.asaging.org/forsa.html

National Interfaith Coalition on Aging
http://www.ncoa.org

REFERENCES

Brush, B. L., & Daly, P. R. (2000). Assessing spirituality in primary care practice: Is there time? *Clinical Excellence for Nurse Practitioners*, *4*(2), 67–71.

Coleman, P. G. (2005). Spirituality and ageing: The health implications of religious belief and practice. *Age and Ageing*, *34*, 318–319.

Daaleman, T., Perera, S., & Studenski, S. (2004). Religion, spirituality, and health status in geriatric outpatients. *Annals of Family Medicine*, *2*(1), 49–53.

Hungelmann, J., Kenkel-Rossi, E., Klassen, L., & Stollenwerk, R. (1996). Focus on spiritual well-being: Harmonious interconnectedness of mind-body-spirit-use of the JAREL spiritual well-being scale. *Geriatric Nursing*, *17*(6), 262–266.

Koenig, H. G., George, L. K., Cohen, H. J., Hays, J. C., Larson, D. B., & Blazer, D. G. (1998). The relationship between religious activities and blood pressure in older adults. *The International Journal of Psychiatry in Medicine*, *28*(2), 180–194.

Koenig, H. G., George, L. K., & Peterson, B. L. (1998). Religiosity and remission of depression in medically ill older patients. *American Journal of Psychiatry*, *155*(4), 536–542.

Miller, W. R., & Thoresen, C. E. (2003). Spirituality, religion and health: An emerging research field. *American Psychology*, *58*, 24–35.

Teinonen, T., Vahlberg, T., Isoaho, R., & Kivela, S. L. (2005). Religious attendance and 12-year survival in older persons. *Age and Ageing*, *34*, 406–409.

STAFF DEVELOPMENT

To prepare health care professionals for a constantly evolving health care environment and to practice within a systems perspective focusing on safety in health care, educational strategies for students and professionals must reflect the realities of practice. This transformation needs to occur in professional schools of education and in the workplace. Education of nurses must support the interest and concerns of the public at large. Risk reduction and prevention of adverse outcomes is a critical priority in health care and becomes the foundation for what and how "we teach." When designing educational strategies, important components include generic competencies within the context of the changing health care environment, specific competencies focused on the care of the elderly, and teaching methods for the enhancement of professional learning.

Generic Competencies

Patient safety is a prominent theme in health care. *To err is human: Building a safe health system* (Kohn, Corrigan, Donaldson, 1999) launched a national campaign for patient safety goals. The Joint Commission for Accreditation for Healthcare Organizations (JCAHO) formalized this concern in 2002 by creating 6 National Safety Patient Goals (NSPG) with 11 specific requirements. In response to a major paradigm shift in tracer methodology and location of and participants in health care delivery, health care professionals are redefining their roles and relationships with each other and with their patients.

Health care professionals need to have a systems orientation, interdisciplinary collaborative skills, and the ability to produce data that address the information needs of multiple and diverse stakeholders. The educational environment also must move beyond the convenient skill/knowledge/task model of education to one that includes decision-making skills, critical thinking, and outcomes-based results that are measurable. In addition, the emphasis of creating systems and performing roles that "make it easy to do things right and hard to do things wrong" must be a component not only of the health care system (Kohn et al., 1999) but of curriculum development and clinical practicum design. A systems orientation encourages providers to view health care as a system of multiple placement options offering the patient choices for recovery and/or support.

Clinical experiences for patients have broadened to include acute, rehabilitative, ambulatory, subacute, home-, community-based, and long-term care. Consequently, all providers need to learn the goals of health care embedded in each of these settings so they can consider the clinical, sociological, ethical, and financial implications for the patient. Knowledge about managed care, "business-like" approaches such as customer service, and evidence-based practice have become basic concepts for virtually all health care professional groups. "Hand-off" communication among all these levels of care also becomes a strategic ingredient of patient safety and professional practice. Consequently, the educational implications for understanding and functioning within this multidimensional, interdisciplinary model of health care complicate teaching in many ways. Myriad clinical experiences that promote diversity and independence become necessary to accomplish this task.

The effective management of transitions is a relatively new perspective of accountability that relies on a systems orientation. The "hand off" can be a critical point of distinction between success and failure for a patient. Learning to appreciate the complexity of transitions is a foundation of expert practice. Allowing for communication that offers the opportunity for sharing relevant data and asking questions so as to challenge the integrity of the process are key. Planning comprehensive care requires collaboration by health professionals to make the right choices with and for patients and families. Technology is an integral part of health-system operations that incorporate clinical, informational, research, professional, and financial aspects of care. Information technology significantly alters the way health care providers and patients interact, communicate, and control outcomes. Informatics education is a relevant staff-development investment in that it enhances quality patient care, accountability, critical thinking, research, decision making, privacy, evidence-based practice, and continuing education/staff development.

Interdisciplinary accountability brings home the point that a group of people with complementary skills can experience more success than an individual alone, particularly when dealing with complex problems. Teams can produce striking achievements with impressive energy, synergy, and efficiency (Pfeiffer, 1998). Teams that build a culture around service connect organizational goals to actions (Studor, 2003). Thus, it is reasonable to expect health care professionals to work together to produce the best quality outcomes for patients, families, and communities. Prescriptive actions that will drive results must be predetermined and not left to chance. Collaboration and service-based teamwork can replace task-based practice with clinical leadership, randomness with hard-wired processes, competition with cooperation, and opinions with knowledge. Health care professionals need to learn how to look for and identify commonalities and shared vision among professionals (Barnum, 1999) to move past traditional notions of turf and ownership of the patient. Commitment to excellence will also align staff and leaders and put the "why" back into health care (Studor, 2003).

Connecting with patients and documenting with data serve as concrete evidence of practice. Documenting the "patient story" structures practice, captures the clinical understanding of the situation, and provides a teaching/learning strategy for improved outcomes (Benner, Hooper-Kyriakidis, & Stannard, 1999). Inherent in the patient story are decisions about where to begin the story, what to tell, what to leave out, and where to end. Novice professionals are often not prepared to tell "the story" and often feel frustrated with their abilities to translate their practice into succinct, meaningful notes. An in-depth understanding of the clinical, legal, and financial value of the medical record also needs to be addressed in basic and continuing education. Rounding with the health care team and preparing the hand-off communication are others forums for "telling the patient story."

Specific Competencies

The specific competencies necessary for the care of an older adult are responsive to three main themes: complexity, fragility, and vulnerability. It is within this framework that specific competencies can be outlined.

Managing primary health problems while simultaneously controlling a variety of coexisting conditions is a challenge for the novice as well as the experienced professional. Concepts and theories of aging, age-related changes, and implications for care can be discussed in a discrete course or in workshops. "Best practices" findings need broad dissemination that reaches providers and educators, not just researchers and regulators.

Familiarity with risk-assessment tools as well as a concentration of health promotion and maintenance efforts in all practice disciplines is key to the quality care of the older adult. Common assessment tools include the evaluation of risk for falls and loss of skin integrity, cognition, and need for pain control. Incorporating these tools into staff education is fundamental to "defensive practice" and the promotion of quality of life for the elderly. The vulnerability of the older adult means that the professional caregiver is a "watchful eye" for concerns such as elder mistreatment, insurance scams, financial threats, education overload, bureaucratic confusion, polypharmacy, and so on. Learning how to create a culture of safety within an organization is a necessary exercise to include in the learning environment.

Performing rounds with the interdisciplinary health care team is a practice skill that presents the older adult with the opportunity for the fusion of clinical expertise with the pragmatism of planning in unison. The needs of elders are often complicated by co-morbidity, special needs, and discharge challenges. Rounding with an outcomes focus, while including the patient and family, supports the development of optimal care planning and safe transitions within the continuum of care.

Teaching Methodologies

The shift from the industrial age to the information age suggests the need for a paradigm shift from teacher to learning agent who would, in turn, create a learning "infostructure" that transcends the four walls of a classroom (Tapscott, 1996). To engage in an educational dialogue rather than listening to a lecture expresses the shift in the educational process. Learning experts report that students retain only 20% of what they hear and even less of what they read on their own. However, more is retained when individuals are involved in their own learning, especially when performance is integrated with real-life situations. Educators, both in schools and in institutions of work, can benefit from this revival by integrating small-group learning and interactive approaches to education. The "safety" of the classroom may be sacrificed for the experience of "learning while you work." In the end, however, the "bedside" as classroom will prove to be worth the effort.

Strategies for information-age education include internship experiences in which learning can be safe yet active and participatory; case-based learning that brings the realities of care delivery into the learning experience; storytelling about patient care that encourages logical reasoning and reflective judgment; and the integration of skills and assessment data for rounding with a purpose, problem solving with safety goals in mind, and planning care that makes a difference in patients lives. Experiencing a failure-mode investigation or a root-cause-analysis exercise may also prove instrumental in teaching of prevention and/or successful rescues (Clarke & Aiken, 2003). Team-teaching is another powerful strategy for role-modeling and demonstrating incentives to actualize interdisciplinary collaboration at the bedside. Having faculty engage in these examples of a success-based spiral is motivating and promotes learning that encourages lasting results.

MARIA L. VEZINA

See also

Communication Issues for Practitioners
Geriatric Interdisciplinary Team Training (GITT)
Information Technology

Internet Resources

Joint Commission on Accreditation of Healthcare Organizations
http://www.jcaho.org

The American Association of Colleges of Nursing
http://www.aacn.nche.edu/

Hartford Institute for Geriatric Nursing
http://www.hartfordign.org/roles/staffDevEd.html

REFERENCES

American Association of Colleges of Nursing (2004).

Barnum, B. (1999). *Teaching nursing in the era of managed care.* New York: Springer Publishing Company.

Benner, P., Hooper-Kyriakidis, P., & Stannard, D. (1999). *Clinical wisdom interventions in critical care: A thinking-in-action approach.* Philadelphia: W. B. Saunders.

Clarke, S. P., & Aiken, L. H. (2003). Registered nurse staffing and patient and nurse outcomes in hospitals: A commentary. *Policy, Politics, & Nursing Practice*, *4*, 104–111.

Kohn, L., Corrigan, J., & Donaldson, M. (Eds.) (1999). *To err is human: Building a safer health system*: Committee of Quality of Healthcare. Washington, DC: Institute of Medicine.

Pfeiffer, E. (1998). Why Teams? In E. Seigler, K. Hyer, T. Fulmer, & M. Mezey (Eds.), *Geriatric interdisciplinary team training*. New York: Springer Publishing Company.

Tapscott, R. (1996). *The digital economy: Promise and peril in the age of networking intelligence*. New York: McGraw Hill.

Studor, Q. (2003). *Hardwiring excellence: Purpose, worthwhile work, making a difference*. Gulf Breeze, FL: Fire Starter Publishing.

STRESS

See
Relocation Stress

SUBACUTE CARE

Subacute care (also referred to as postacute or transitional care) is an episode of care that lasts weeks to months and occurs after an acute hospitalization when skilled services are required to treat active medical conditions, but at an intensity less than that of acute care and more than ambulatory care. Hip-fracture rehabilitation and intravenous antibiotic therapy for chronic osteomyelitis are examples of subacute care (Levenson, 1996, p. 22).

Individuals requiring subacute care may be any age and have a broad spectrum of acute and chronic medical conditions, underlying impairments, and risk factors. Subacute patients typically require between 3 and 8 hours of nursing care daily and a physician visit approximately weekly, for at least 1 month after admission.

Subacute care does not introduce any new care components; rather, it represents a different approach to caring for patients with moderate and low acuity conditions who require specific services. Subacute care is provided in several different settings (i.e., hospitals, skilled-nursing facilities, and the community). There is considerable overlap at both ends of the spectrum—between subacute patients and traditional outpatients, and subacute patients and those in acute or specialty hospitals (Griffiths & Sironi, 2005).

Subacute care manages medical illnesses and their functional consequences. After treating and stabilizing an acute illness, the prognosis depends on the severity and baseline condition. The initial illness may require prolonged treatment, and new or worse physical, functional, and psychological impairments may result from hospitalization. Often, the primary diagnosis or reason for admission is complicated by additional symptoms, risks, or conditions, such as delirium, a previous stroke, or functional impairment. Subacute-care settings can often initiate or continue treatments for the medical causes and manage their consequences. Nonetheless, successful transition to the ambulatory community setting is not guaranteed, and rehospitalization rates are high. It is possible to identify some risk factors for rehospitalization and interventions that can lower these rates (Coleman, Min, Chomiak, & Kramer, 2004). Other factors that may contribute significantly to rehospitalization include acceleration of hospital discharges without regard to risk factors, inadequate transfer of information from hospitals, and insufficient preparation by postacute-care sites to accept and manage more complex patients (Boockvar, Fridman, & Marturano, 2005).

Place in the Health Care Continuum

Subacute care plays a key role in any continuum of services. Coordinated efforts involving subacute care may include an integrated delivery systems (IDS), an organization or group of organizations offering a systematic approach to providing health care services, alliances (i.e., relationships of independent providers who agree to work together), and networks (i.e., relationships of providers who agree to common governance, goals, objectives, policies, and accountability).

Programs and Services

Subacute care is commonly discussed and marketed according to its clinical programs and services—for example, rehabilitation therapies, wound management, intravenous medications, head-injury care, postoperative care, and ventilator care. However, none of these treatments or services is unique to this setting. Thus, subacute care is best viewed as care for patients who have diverse needs, including various conditions or risks, rather than as care of a specific condition or risk.

Subacute care generally does not cover services such as intensive care, high-intensity emergency care (beyond basic cardiopulmonary resuscitation and first aid), and on-site diagnostic services, although some programs may offer limited aspects of these services. Most subacute care programs have limited specialties, although some programs offer specialized services such as dialysis and ventilator care.

Whereas hospitals treat complicated cardiopulmonary conditions such as severe acute respiratory failure, many pulmonary and ventilator-dependent patients with complicated respiratory conditions need care but do not necessarily require prolonged hospitalization. Patients who receive postoperative care in subacute settings may need frequent monitoring and complex treatment after surgery but not to the extent provided by hospitals. In each case, patient needs often stem from both the principal condition and from other coexisting or complicating factors, such as pain, nutrition and hydration deficits, infections, bleeding, complex or nonhealing wounds, and other medical conditions. Patients ineligible for subacute care may include those who are medically or psychiatrically unstable, those not expected to recover, or those who cannot participate in the plan of care (Levenson, 1996, p. 182).

Essential Organizational Systems and Support

As a complex system, successful subacute care systematically coordinates the activities of several individuals and disciplines. Nurses, physicians, social workers, dietitians, physicians, and therapists provide care, with help from nursing assistants and others, within a facility, program, or organization that they generally do not organize or operate. Subacute care occurs in a complex reimbursement and regulatory environment, and clinical care can take place only when supported by admitting, facilities, billing, and other departments.

Coordination of care is key, and areas of special interest include obtaining participation and providing essential support to patients and their families; promoting participation in health care decision making such as advance directives; assuring availability of support services, such as diagnostic testing and respiratory therapy; and key support from other internal departments.

Quality Measurement in Subacute Care

Diverse factors influence subacute-care outcomes, especially in patients with complex acute and chronic co-morbid medical and psychiatric conditions and preexisting functional and cognitive impairments.

Health status and functional status are related and affect each other and subacute outcomes. Having better cognitive status and motor status on admission was associated with improved motor function outcomes, and admission health status was independently and positively correlated with likelihood of discharge to the community (Likourezos et al., 2002).

Currently, settings that provide subacute care are governed by diverse expectations and standards. In the 1990s, JCAHO developed, and subsequently dropped, a subacute accreditation program. Extensive federal (so-called OBRA '87) regulations and state regulations govern care in the nation's nursing homes but cover relatively few aspects of care that are relevant to providing more complex medical care in those settings.

Quality measures related to processes and outcomes can be identified for many aspects of subacute care. Because subacute care occurs in various settings, measures must be comparable across settings (McCall, Korb, Petersons, & Moore, 2005). Because subacute care requires trained and skilled individuals to render high-quality care, evidence-based guidelines developed at other sites may be applicable in the subacute setting (Rodin, Saliba, & Brummel-Smith, 2006).

Challenges and Opportunities Presented by Subacute Care

The health care system responds to and generates economic and social forces. There are increasing opportunities for nonacute settings to provide acute and subacute care and related services. Medicare and managed-care reimbursement has shifted to support more care in subacute settings. However, Medicare covers all postacute care under the "skilled" level of care and does not have a "subacute" designation. The Balanced Budget Act of 1997 replaced the traditional "cost-plus" reimbursement system for skilled care with a Prospective Payment System (PPS). Initially, these payment changes reduced the utilization of postacute care without appearing to increase adverse outcomes (McCall et al., 2003). But, in recent years, shorter hospital stays, increased managed-care involvement, and loss of traditional nursing-home residents to other settings have converged to expand the provision of institution-based subacute care in nursing homes.

The Medicare skilled PPS utilizes payment categories based on the Minimum Data Set (MDS), an assessment tool originally developed for long-term-care residents that lacks some medically oriented items. Over time, the Centers for Medicare and Medicaid Services (CMS) has modified the MDS and PPS to recognize greater medical complexity of many patients receiving postacute care and increased costs of their care. It is unlikely that a reimbursement system based on limited data can reflect fully the time and cost of providing subacute care.

CMS also modified the scope of diagnoses that it will reimburse, thereby opening up opportunities for transfer to other postacute settings. Meanwhile, many managed-care companies established their own payment rates and methodologies in direct negotiations with postacute providers. Furthermore, other post-acute settings have promoted their own tools. For instance, the home-care industry supported development of the Home Health Care Outcome & Assessment Information Set (OASIS) tool, and the rehabilitation industry promoted its measure as the basis for its site-specific PPS.

Nonetheless, there are ample reasons to promote uniformity across settings. The Medicare Payment Advisory Commission (i.e., the agency that advises Congress on Medicare issues) has advocated that Medicare payment policies in the postacute setting should focus on patients, not settings. (http://www.medpac.gov/public_meetings/transcripts/0305_PatAssm_CC_cov.pdf). Efforts continue to clarify the true need for and benefits of various forms of subacute care.

Although availability of postacute care is a major determinant of whether patients use such care and which type of facility they use (Paddock, Saliba, Totten, & Escarce, 2005), it is not entirely clear whether more postacute care leads to better results or just more utilization. Factors that differentiate those who need institution-based versus community- or home-based postacute care are still being investigated. The future continuum of care spans episodic services at home or in an ambulatory setting through high acuity care in a high-technology setting. However, the most efficient use of these settings still awaits the proper alignment of levels of care designations, care sites, resource and staffing allocations, reimbursement, licensure and accreditation categories, care standards, and quality measures.

STEVEN LEVENSON

See also

Home-Health Care
Hospital-Based Services
Medicaid
Medicare
Medicare Managed Care
Nursing Homes

Internet Resources

American Medical Directors Association (AMDA)
http://www.amda.com

Centers for Medicare and Medicaid
http://www.cms.hhs.gov

Joint Commission on Accreditation of Healthcare Organizations (JCAHO)
http://www.jointcommission.org

REFERENCES

Boockvar, K. S., Fridman, B., & Marturano, C. (2005). Ineffective communication of mental status information during care transfer of older adults. *Journal of General Internal Medicine*, *20*(12), 1146–1150.

Coleman, E. A., Min, S. J., Chomiak, A., & Kramer, A. M. (2004). Posthospital care transitions: Patterns, complications, and risk identification. *Health Services Research*, *39*(5), 1449–1465.

Griffiths, P., & Sironi, C. (2005). Care needs and point prevalence of post−acute patients in the acute medical wards of an Italian hospital. *International Journal of Nursing Studies*, *42*(5), 507–512.

Levenson, S. A. (1996). *Subacute and transitional care handbook*. St. Louis, MO: Beverly-Cracom.

Likourezos, A., Si, M., Kim, W. O., Simmons, S., Frank, J., & Neufeld, R. (2002). Health status and functional status in relationship to nursing home subacute rehabilitation program outcomes. *American Journal of Physical Medicine & Rehabilitation*, *81*(5), 373–379.

McCall, N., Korb, J., Petersons, A., & Moore, S. (2003). Reforming Medicare payment: Early effects of the 1997 Balanced Budget Act on postacute care. *Milbank Quarterly*, *81*(2), 277–303, 172–173.

McCall, N., Korb, J., Petersons, A., & Moore, S. (2005). Challenges in measuring nursing home and home health quality: Lessons from the First National Healthcare Quality Report. *Medical Care*, *43*(3 Suppl.), I24–I32.

Paddock, S., Saliba, D., Totten, M., & Escarce, J. J. (2005). How much is postacute care use affected by its availability? *Health Services Research*, *40*(2), 413–434.

Rodin, M., Saliba, D., & Brummel−Smith, K. (2006). Guidelines abstracted from the Department of Veterans Affairs/Department of Defense clinical practice guideline for the management of stroke rehabilitation. *Journal of the American Geriatrics Society*, *54*(1), 158–162.

SUBCONTINENTAL ELDERS

Historic and Cultural Context

Older adults from the Indian Subcontinent, which traditionally includes India, Pakistan, Bangladesh, Sri Lanka, and Nepal, represent a diverse group—culturally and religiously. Religions practiced by individuals from this area include Hinduism, Islam, Buddhism, Sikhism, Jainism, Christianity, and Judaism. Adding to the heterogeneity are the numerous traditions, languages, and practices within each country as well. This discussion focuses on Asian Indian older adults, the majority of whom are Hindu.

Asian Indians have been in the United States since as early as 1790. Through the late 1800s, a few Indians immigrated to the United States—mostly as unskilled laborers or agricultural workers. Immigration was curtailed in 1917 by the passage of the "Barred Zone Act." It restarted in 1946 with the passage of a bill allowing a small quota of Indians annually to immigrate and become naturalized. The passage of the Immigration and Naturalization Act (INA) of 1965 allowed for a boom in the immigration of Asian Indians from certain professions or educational backgrounds. Hence, the first group of Asian Indian immigrants to the United States was highly educated and skilled. Thereafter, laws were passed allowing family reunification, and the Asian Indian population grew steadily through the 1970s and 1980s until it attained a second surge in the 1990s, heralded by the information-technology boom.

Currently, 1.7 million Asian Indians live in the United States. Although they compose only 0.6% of the population, Asian Indians are the third largest group of Asians, following the Chinese and Filipinos. There are an estimated 66,834 Asian Indian elders living in the United States. Asian Indian Elders in the United States belong to two major groups—those that immigrated around 1965 and have since settled in the United States and those who have come to join or visit their family living in the United States. These two groups differ greatly demographically and face different issues as they continue to live in the United States. The former tend to be more acculturated, affluent, and independent. The latter group may be isolated and lonely (e.g., language barriers, lack of independent transportation), lack health benefits, depend on their children or family, and suffer from culture shock.

Ethnic-Specific Medical Problems

Asian Indians have high rates of coronary artery disease, hypertension, diabetes mellitus, and hyperlipidemia (Ivey, Khatta, & Vedanthan, 2002; Mohanty, Woolhandler, Himmelstein, & Bor, 2005). Genetic predispositions to altered transport of cholesterol, endothelial dysfunction, and inflammation; increased insulin resistance; and the metabolic syndrome contribute to this as well as lifestyle factors. Asian Indians' diets tend to be high in carbohydrates as well as tropical oils, butter, and ghee (clarified butter). Additionally, many Asian Indians do not exercise regularly, worsening their cardiovascular risk.

Many older Asian Indians practice traditional medicine such as homeopathy or Ayurveda (Alagiakrishnan & Chopra, 2001; Periyakoil, 2004). Ayurvedic medicine has existed for 5,000 years, and attributes disease to an imbalance in the three universal energies (i.e., *tridosha*) that regulate all natural processes—*pitha* (i.e., bile), *vatha* (i.e., wind/air), and *kapha* (i.e., phlegm). Thus, many older Asian Indians may be taking ayurvedic herbs or other alternative treatments in conjunction with traditional Western allopathic treatments.

Mental illness carries a strong stigma, and symptoms are often concealed as somatic complaints. If present, treatment by traditional allopathic means could be difficult. Additionally, many older adults will not agree to counseling, social work services, or therapy because personal issues are kept within the family and not discussed outside this tight circle.

Karmic law—a law of behavior and consequences in which actions of the past (whether in this life or a prior life) have effects in this life or in future lives—is a central tenet of Hinduism as well as Buddhism, Jainism, and Sikhism (Deshpande, Reid, & Rao, 2005). Illness and its accompanying symptoms, including pain, are seen as a result of Karma. Many older Asian Indians are more accepting of death as a part of the life cycle and tend not to fear it. They may view this stage of their life as preparation of their soul for death and the afterlife. Older Asian Indians have very low prevalence rates of completed advanced directives and have demonstrated low levels of knowledge about these documents as well.

Approach to the Older Asian Indian Adult

Older adults hold an esteemed position within Asian Indian culture (Periyakoil, 2004; Alagiakrishnan & Chopra, 2001). They are respected and seen as the link to Indian culture, heritage, and religion. It is important to address the patient warmly as Mr. or Mrs. until given permission to use a first name. Although most Asian Indian older adults are well educated and speak English, access to a translator or translating service should be available.

Older Asian Indians come from a culture that respects physicians and expects physicians to take control of most decisions. Indians tend to view themselves as part of a family unit, and the concept of patient autonomy may not be familiar. Medical discussions and decision making will necessitate family involvement. Furthermore, many families may request physicians not to discuss bad news with their older relatives because this could deprive the older adult of hope, cause worry, or hasten bad outcomes.

It is important for providers to be aware of certain customs practiced among Asian Indian elderly patients to avoid culturally insensitive remarks or behaviors. Modesty is paramount when examining women and many will prefer a female health care provider. Many Hindu women wear a *bindi* on their forehead or may have vermillion in the part of their hair (*sindhoor*). The *bindi* has multiple meanings varying from decorative to a sign of being married. Women who are married often wear *Sindhoor*. Older women may wear a *mangalsutra* necklace (a combination of black and gold beads) indicating that they are married. Widows often wear only white (the color of mourning) and usually will not wear the *bindi, sindhoor, or mangalsutra*. Indian men may wear a sacred string around their wrist or across their trunk. Sikhs often wear a steel bracelet (*karha*). All of these are considered sacred and should not be removed without permission.

Hospitals and doctors' offices can be uncomfortable and attention needs to be given to food services (i.e., religious restrictions), scheduling of procedures/tests (i.e., auspicious/inauspicious times), clothing (i.e., hygiene, coverage), and gender of health care provider. If a patient dies, it is important to ascertain from the family what practices and rituals are considered important and to allow them some privacy. Interfering with this process can be very offensive for the patient or the family. Most Asian Indians do not readily agree to organ donation or post-mortem exams.

Arun S. Rao

See also
Cultural Assessment
Cultural Competence and Aging

Internet Resources

Ethnomed
http://ethnomed.org

EndLink
http://endlink.lurie.northwestern.edu/religion_spirituality/religions.cfm

National Indo-American Association of Senior Citizens
http://www.niaasc.org

REFERENCES

Alagiakrishnan, K., & Chopra, A. (2001) Health and health care of Asian Indian American elders. Stanford University Curriculum in Ethnogeriatrics. Available at http://www.stanford.edu/group/ethnoger

Deshpande, O. M., Reid, M. C., & Rao, A. S. (2005). Attitudes towards end-of-life care among Asian Indian Hindus. *Journal of the American Geriatrics Society*, *53*(1), 131–135.

Ivey, S. L., Khatta, M., & Vedanthan, R. (2002). Cardiovascular disease, a brown paper: The health of South Asians in the United States. Available at http://www.sapha.net

Mohanty, S. A., Woolhandler, S., Himmelstein, D. U., & Bor, D. H. (2005). Diabetes and cardiovascular disease among Asian Indians in the United States. *Journal of General Internal Medicine*, *20*, 474–478.

Periyakoil, V. S. (2004). Older Asian Indian Americans. In *Doorway thoughts, cross-cultural health care for older adults* (pp. 69–79). Sudbury, MA: Jones & Bartlett Publishers.

SUBJECTIVE WELL-BEING

See
Self-Rated Health

SUBSTITUTE DECISION MAKING

Because the decisional capacity of the elderly may be diminished, fluctuating, or lapsed entirely, it is important to anticipate the need for others to make health care decisions for patients who may lack the capacity to decide about medical treatment for themselves. Although in the past elderly patients may have had and even expressed preferences about treatment, they may have lost the ability to participate in planning their care. These responsibilities then fall to substitute decision makers, who use what they know about the patient's wishes or what they believe to be in the patient's best interest to make decisions on his or her behalf. Two approaches have developed to respond to the care-planning needs of incapacitated patients—advance directives and surrogate decision making.

Through advance directives—that is, living wills and health care proxy appointments—a capable person can prospectively articulate wishes, values, and directions that can be communicated and implemented after capacity has lapsed. These legal authorizations are intended to ensure that the voice of the formerly capacitated person will still be heard in the care-planning discussion. Amplification of the patient's voice is the responsibility of the health care proxy agent and the care professionals who interpret and honor the provisions of the advance directives.

A *health care agent* is a competent adult older than18 years of age who has been legally designated by a capable patient, through a health care proxy appointment, to make any and all medical decisions whenever the patient is unable to make those decisions. The advantage of a health care proxy over a living will is that care decisions are made for the patient by a person (health care agent) who can interact with the care team and respond to changing medical conditions in light of the patient's known values and preferences, as well as the diagnosis and prognosis. The proxy appointment presupposes a trusting relationship and the willingness of the agent to use his or her judgment in the patient's interest rather than rigidly following a set of instructions. Through the appointment, the patient is saying, "I believe you know me and understand what I consider important. I trust you to make the decisions that you think I would make if I knew what you will know about my condition."

Although people are encouraged to legally express health care preferences through advance directives, only 15% to 25% of adults in the United States have a living will or health care proxy (Post, 2006). Thus, care decisions for most incapacitated patients are made by unofficial surrogates, including family, close friends, and trusted others and, in their absence, care providers and courts.

Surrogate decision making seeks to identify and amplify the voice of the currently incapacitated patient who never executed an advance directive but may have verbally communicated treatment wishes, as well as the patient who never articulated health care preferences of any kind. Absent explicit instructions, it is necessary to search for guidance in what is known about the patient or what will promote his or her best interest. Most often, these health care decisions are made by surrogates based on either substituted judgment (when the patient's wishes are known or can be inferred) or the best-interest standard (when the patient did not have or articulate treatment preferences). Substituted judgment is an assessment of what the patient would want if able to choose, based on prior statements, behaviors, and patterns of decision making. The best-interest standard weighs the benefits and burdens to the patient of diagnostic and therapeutic options as evaluated by the substitute decider(s).

Health care surrogates are competent adults older than 18 years who, although not specifically chosen or legally appointed, assume the responsibility for making health care decisions on behalf of patients who have lost the ability to do so. A surrogate, by state law, is a person whose authority to make health care decisions for someone else is based on state statute or case law. An informal surrogate is a person, usually someone close to the patient, who is asked by the medical team to participate in making treatment decisions because there is no one who has been specifically appointed or legally authorized (Post, Blustein, & Dubler, 1999, 2006). As a rule, both medicine and law are more comfortable providing than withholding treatment and the law in most states accords considerable authority to surrogates, especially next of kin, in consenting to treatment. Decisions about limiting treatment are more problematic and depend on the state in which the patient is treated (Sabatino, 1999).

Most substitute decision makers, whether legally appointed agents or surrogates, are family members who are presumed by tradition and often by law to know patients most intimately and act in their best interest. It is expected in many cultures that, in times of trouble and serious decision making, families are the best source of insight, information, and support. This notion underlies the customary practice of health care providers, law enforcement officials, teachers, and others who care for people to seek family assistance in making decisions.

Compounding the burdens faced by agents and surrogates is the fact that their responsibilities are often triggered at times of medical crisis, intense emotion, and family turmoil. Sadness about impending death, concerns about their own aging, and uneasiness with role reversals are layered on top of old rivalries, lingering resentments, and guilt related to unfulfilled obligations. The unresolved conflicts that characterize family dynamics are heightened in an atmosphere of crisis, illness, and death. When family members are placed in the position of making decisions—often about life and death—for loved ones, the added stress can be overwhelming.

Because decision making for others carries such significant implications, considerable discussion should precede the lapse of capacity or the onset of illness. Adults of any age and health status should speak with their families, close friends, and care providers about their treatment wishes, thoughts about comfort and function, and notions of an acceptable quality of life. Research reveals the need for earlier, more frequent, and better doctor–patient communication, focusing on the goals of care rather than specific interventions (Lo & Steinbrook, 2004). Whenever possible, health care proxy agents should be appointed and included in physician–patient discussions (Zeleznick et al., 1999). To promote collaboration between doctors and their patients' proxies and surrogates, the following guidelines were developed and appear in *Making health care decisions for others: A guide to being a health care proxy or surrogate—a quick reference for physicians*.

1. Determine if the patient has designated a health care proxy and review all documents that provide guidance about the patient's prior wishes. If there is no appointed proxy, determine who will be acting as the patient's surrogate in the event that capacity is lost.
2. Ensure that all relevant information and documents are placed in the patient's medical record.
3. Discuss general treatment preferences with the patient prior to loss of capacity and note preferences in the medical record.
4. Encourage patients to routinely articulate preferences and select a health care proxy prior to an admission or emergency situation.
5. With the patient's consent, include the proxy or surrogate in discussions with the patient.
6. Upon determination that the patient has lost capacity, provide the proxy or surrogate with the same medical information (i.e., diagnosis, prognosis, treatment options, and recommendations) that a capacitated patient would receive in order to make informed decisions. The proxy or surrogate may rely on the patient's previously expressed wishes, knowledge of the patient's values, beliefs and attitudes, and his/her own judgment as to what is in the patient's best interest. Remember that the patient trusts the proxy and, presumably, the surrogate to make the best decision possible under the circumstances.
7. Support the proxy or surrogate in the process of deciding for another, which is often more difficult than deciding for one's self.
8. Alert the proxy or surrogate to specific changes in the patient's medical condition.
9. Apply patient confidentiality standards to information provided to the proxy or surrogate.
10. Avoid burdening the proxy or surrogate with "false" decisions (e.g., when a patient is to be transferred out of the ICU, do not present the issue to the proxy as a choice she or he must make).
11. Explain that a Do Not Rescusitate (DNR) order does not mean do not treat. Explore palliative-care options when cure is no longer the goal. Assure the proxy or surrogate that the patient will not be abandoned.
12. Advise the proxy or surrogate of institutional resources, such as bioethics consultants, patient advocates, social workers, translators, and spiritual advisors.

13. Use institutional resources to support your relationship with the proxy or surrogate. Request a bioethics consultation or assistance from patient services and social services whenever there is confusion, uncertainty, or conflict about decision making.

Perhaps the most important clinical resource physicians bring to the interaction with substitute decision makers is their support. Decisions about starting, continuing, or terminating treatment, especially life-sustaining measures, can be painful and often paralyzing for those who are asked to act on behalf of their loved ones. If abandoned to make these difficult choices alone, the agent or surrogate can feel solely responsible for the outcome. Health care professionals, especially physicians, have an obligation to become familiar with their patient's wishes and shoulder part of the decision-making burden (Post et al., 2006).

LINDA FARBER POST

See also

Advance Directives
Competency and Capacity

Internet Resources

Albert Einstein College of Medicine
http://epi.aecom.yu.edu/web/home.aspx

Geriatric Nursing Resources for Care of Older Adults (see Treatment Decision Making)
http://www.geronurseonline.org

REFERENCES

Montefiore Medical Center, Division of Bioethics. (1999). *Making health care decisions for others: A guide to being a health care proxy or surrogate—a quick reference for physicians*. Bronx, NY.

Post, L. F. (2006). Advance directives for health care. *The encyclopedia of aging* (4th ed.) New York: Springer Publishing Company.

Post, L. F., Blustein, J., & Dubler, N. N. (1999). The doctor–proxy relationship: An untapped resource. *The Journal of Law, Medicine & Ethics*, *27*(1), 5–12.

Post, L. F., Blustein, J., & Dubler, N. N. (2006). *Handbook for health care ethics committees*. Baltimore: The Johns Hopkins University Press.

Lo, B., & Steinbrook, R. (2004). Resuscitating advance directives. *Archives of Internal Medicine*, *164*, 1501–1506.

Sabatino, C. P. (1999). The legal and functional status of the medical proxy: Suggestions for statutory reform. *The Journal of Law, Medicine & Ethics*, *27*(1), 52–68.

Zeleznick, J., Post, L. F., Mulvihill, M., Jacobs, L. G., Burton, W. B., & Dubler, N. N. (1999). The doctor–proxy relationship: Perception and communication. *The Journal of Law, Medicine & Ethics* *27*(1), 13–19.

SUICIDE

Epidemiology/Public Health Significance

Older adults have the highest suicide rate of any age group. The World Health Organization (WHO) reports that, for most countries, suicide rates generally increase with age; however, in the United States, suicide rates form a more complex pattern. According to the Centers for Disease Control (CDC), suicide is the eighth leading cause of death for all U.S. men. White males older than 65 years have a sharply elevated risk. For Black males, suicide peaks occur in younger and older adulthood, representing a bimodal distribution. Suicide rates for women peak in mid-life, are generally lower, and are relatively stable in older age.

The prevalence of suicide attempts in late life is unclear given the lack of available surveillance mechanisms, but older adults attempt suicide less often than younger adults. In the general population, there is a reported range of 8 to 40 suicide attempts per each completed suicide. In contrast, for older adults, the ratio of attempts to completion is only 4 to 1. The higher apparent lethality of suicidal acts in older adults may be explained by their increased physical burdens, which make an injury more likely to be lethal. In addition, older adults are more likely to live alone and hence less likely to be discovered and rescued. Finally, they tend to be more determined, plan more carefully, and use firearms more often than younger adults.

Risk Factors/Correlates of Suicide

History of Suicidal Ideation or Attempts

Throughout the life course, a history of suicide attempts or suicidal ideation increases the risk for suicidal behavior and completed suicide. Although it is less common than in younger people, a history of earlier life suicidality signals high risk.

Psychiatric Illness

"Psychological autopsy" studies have repeatedly shown that affective disorders, especially major depression, are the predominant mental illness of late-life suicides, present in up to 87% of cases (Conwell, Duberstein, & Caine, 2002). Less common but still significant are substance-use disorders, especially alcohol. The data on anxiety and nonaffective psychotic disorders are inconclusive. Somewhat surprisingly, no study has yet found an increased risk for suicide associated with diagnoses of dementia or delirium. Although a great majority of suicide decedents had a psychiatric illness at the time of death, the illness was diagnosed and treated in a minority of cases. Psychiatric disorders in late life often go undiagnosed because the signs and symptoms may be masked by co-morbid physical illness. Moreover, older adults are often reluctant to discuss emotional pain.

Physical Illness

Physical illness and functional impairment in late life are so common that it is difficult to prove that they represent risk factors for suicide. Initial indications are of associations between suicide and malignancies, seizure disorder (especially with a temporal lobe focus), congestive heart failure, and chronic obstructive lung disease; severe pain; and functional limitations due to any cause. Because of the close associations between late-life physical illnesses, their treatments, and depression, establishing whether illness increases risk independent of depression is even more difficult. At this point, the complex relationship among psychiatric illness, physical illness, and functional status requires further study to delineate the role of each as independent risk factors for suicide.

Stressful Life Events

Stressful life events appear to play an important role in late-life suicide. Particular events that have been linked to suicide in older people include bereavement, social isolation and disruptions in family relationships, financial distress, and somatic illness (Rubenowitz, Waern, Wilhelmsson, & Allebeck, 2001).

Personality Traits/Characteristics

No personality traits are independent predictors of suicide, but several personality characteristics are associated with suicidal behavior. Anxiety, obsessiveness, hypochondriasis, hostility, shy seclusiveness, and a rigid and independent style have been linked with older adults who died by suicide (Conwell et al., 2002). High levels of "neuroticism" and low levels of "openness to experience" from the NEO Personality Inventory distinguish people who committed suicide after the age of 50 as compared to matched controls in one study as well.

Neurobiological Factors

Given the sharp rise in suicide rates in later years, many are considering a possible role for aging-related neurobiological factors in the emergence of suicidality in late life (Mann, Waternaux, Haas, & Malone, 1999). Theories include the possibility that neurotransmitters, such as serotonin, play a part in modulating the impulsive and aggressive behaviors often associated with completed suicides. Unfortunately, older adults often have multiple medical co-morbidities and multiple prescription medications that complicate these studies in later life. Although there is no biologically based "test" for suicide risk, researchers hope that greater understanding of the biological underpinnings of aggressive and self-destructive behaviors will lead to development of clinically applicable tools.

Access to Lethal Means

Several groups have found that suicide risk increases with access to lethal means, and that when access to lethal means is restricted, suicide rates are reduced. Almost three-quarters of late-life suicides are by firearms. For men in later life, both acquisition of a weapon within 1 year and having access to a handgun in the home have been found to predict subsequent suicide.

Implications for Management: Assessment

The older adult in crisis should undergo a formal psychiatric evaluation to determine possible major psychiatric diagnoses, personality traits, coping mechanisms, physical co-morbidities, and overall functional status. This formal psychiatric evaluation can help formulate a comprehensive treatment plan. When an older adult is identified as being suicidal, a detailed assessment must be performed immediately. This assessment should include reasons for considering suicide, the specifics of past and present suicidal thoughts, past history of suicidal behavior, and current history of self-harming behavior. When one considers the person's determination to complete suicide and the degree of planning that has already taken place, it is imperative to assess the suicidal person's access to lethal means, especially firearms. Any weapons accessible to the patient should ordinarily be removed to a secure, inaccessible place. This may include having weapons secured by family members or local law enforcement. If the suicidal person cannot or will not engage in this assessment, hospitalization may be indicated for further evaluation and to ensure the patient's safety (American Psychiatric Association, 2003).

The older adult's reasons for *not* committing suicide, psychosocial support network, and perceived sources of meaning in life should also be discussed because this information may lead to potential interventions. Although it is crucial to involve the older adult's formal and informal social supports, the quality and usefulness of these relationships with the at-risk older adult may vary. Once these supports are identified, they should be educated about the patient's risk factors, treatment, follow-up, and other interventions that are required.

Prevention: Approaches for Older Adults at Immediate Risk

Prevention strategies target individuals who are at risk for suicide. Improved detection and treatment of depression are essential. Although few older adults seek care from mental health professionals, up to 75% of older adults who took their own lives had seen their primary care provider within 30 days prior to death and about one-third had seen their primary care provider within the last week of life. Correlational studies have supported the idea that as prescription rates for antidepressants have increased, suicide rates have decreased, although a causal relationship has not been clearly established. Nevertheless, identification and treatment of depressive symptoms through medication and/or psychotherapy is crucial, and it is the primary-care setting that offers the most available access to older adults at risk.

Selective Prevention

Selective prevention is concerned with reduction of factors that are known to place older people at risk prior to the development of the suicidal crisis. Examples include social isolation, physical and/or functional impairment, and mild (i.e., subsyndromal) depressive symptoms. Existing medical and social services should be mobilized for these seniors. Social services such as care management and social outreach groups may help to lower suicide risk by helping with isolation and functional impairment while also providing a support network. Comprehensive geriatric assessment clinics can provide multidisciplinary diagnostic and treatment services to reduce physical morbidity, optimize functioning, and maintain elders' engagement in the community.

Universal Approaches for All Older Adults

Universal prevention targets an entire population regardless of any individual's risk status. As a society, we are just beginning to fully realize the impact of suicidality and mental illness, especially for older adults. Universal approaches to late-life suicide prevention should include education of the general public designed to decrease ageism and stigma associated with older adults receiving mental health treatment. Some legislative approaches to restrict access to lethal means have been successful. In 1998, legislation in Great Britain limited the amount of acetaminophen and aspirin sold per pack over the counter, and the number of deaths by overdose of these medications was reduced (Hawton et al., 2001). When the Brady Handgun Violence Prevention Act of 1994 was passed, the rate of suicide by firearm for individuals older than 55 years declined significantly (Ludwig & Cook, 2000).

ELIZABETH J. SANTOS
YEATES CONWELL

See also

Anxiety and Panic Disorders
Depression in Dementia
Euthanasia
Physician Assisted Suicide and Euthanasia
Social Isolation

Internet Resources

American Association of Suicidology
http://www.suicidology.org

American Foundation for Suicide Prevention
http://www.afsp.org

National Center for Injury Prevention and Control
http://www.cdc.gov/ncipc/wisqars/default.htm
http://www.cdc.gov/ncipc/factsheets/suifacts.htm

National Institute of Mental Health Suicide Research Consortium
http://www.nimh.nih.gov/suicideresearch/consortium.cfm

National Strategy for Suicide Prevention
http://www.mentalhealth.samhsa.gov/suicideprevention/

Suicide Prevention Action Network
http://www.spanUnited States.org/

Suicide Prevention Resource Center
http://www.sprc.org/index.asp

World Health Organization: Health Topics – Suicide
http://www.who.int/topics/suicide/en/

REFERENCES

American Psychiatric Association, Workgroup on Suicidal Behaviors (2003). Practice guidelines for the assessment and treatment of patients with suicidal behaviors. *American Journal of Psychiatry*; *160* (Suppl. 11), 1–60.

Conwell, Y., Duberstein, P. R., & Caine, E. D. (2002). Risk factors for suicide in later life. *Biological Psychiatry*, *52*(3), 193–204.

Hawton, K., Townsend, E., Deeks, J., Appleby, L., Gunnell, D., Bennewith, O., et al. (2001). Effects of legislation restricting pack sizes of paracetamol and salicylate on self-poisoning in the United Kingdom: Before and after study. *British Medical Journal*, *322*(7296), 1203–1207.

Ludwig, J., & Cook, P. J. (2000). Homicide and suicide rates associated with implementation of the Brady Handgun Violence Prevention Act. *Journal of the American Medical Association*, *284*(5), 585–591.

Mann, J. J., Waternaux, C., Haas, G. L., & Malone, K. M. (1999). Toward a clinical model of suicidal behavior in psychiatric patients. *American Journal of Psychiatry*; *156*(2), 181–189.

Rubenowitz, E., Waern, M., Wilhelmsson, K., & Allebeck, P. (2001). Life events and psychosocial factors in elderly suicides: A case control study. *Psychological Medicine*, *31*(7), 1193–1202.

SUNDOWNING

Sundowning (i.e., sundown syndrome) is the term used to describe a characteristic set of behavioral symptoms associated with cognitive and affective disorders common in older adults. The name is derived from the time at which the behaviors begin, during the afternoon and evening hours. Associated terms are acute confusion, altered mental state, dementia, and delirium.

Delirium is characterized by the American Psychiatric Association in the Diagnostic and Statistical Manual of Mental Disorders, Text Revision (*DSM-IV-TR*) as disturbed consciousness (e.g., impaired environmental awareness and cognitive change including altered memory, disorientation, language disturbance) or a perceptual disturbance that cannot be accounted for by preexisting dementia. Delirium may be associated with sleep–wake disturbances and the altered psychomotor behavior of sundowning. Those with delirium may fall, remove their medical equipment, and vocalize by moaning, cursing, complaining, and screaming and may exhibit aggressive behavior. Nocturnal delirium is referred to as sundown syndrome.

Circadian rhythms are related to sundowning because they influence several physiological processes that regulate body functions and behavior. The suprachiasmatic nucleus, involved in the pathophysiology of Alzheimer's disease (AD), regulates circadian rhythmicity. Circadian rhythms are observable in 24-hour cycle changes in core body temperature, hormonal secretions, red-cell production, and other physiological processes. Individuals with AD are more likely than those without AD to exhibit more activity at night and the later times of peak activity and temperature rhythms associated with sundown syndrome.

Diagnosis

Diagnosis is important when sundown syndrome is suspected. The most probable conditions causing similar signs are delirium, dementia, and depression. *Acute confusion* is the term preferred to describe altered cognition and behavior until delirium, dementia, and/or depression diagnoses can be established. The most frequent cause of any of these altered mental states is medication, especially antidepressants, antipsychotics, narcotics, and other drugs with psychotropic effects.

Differentiating delirium, dementia, and depression is important. The course of delirium fluctuates over 24 hours, whereas depression and dementia have more stable signs and are worse in the morning and during stressful situations. Delirium has a shorter course than either depression or dementia, with global rather than specific attentional disturbances, with affect lability that varies from flat to excitable, impaired orientation, and incoherent speech. In depression, affect is flat and orientation is normal, with distractible attention and slowed speech. Disturbed sleep is common in both delirium and depression, but the usual pattern of daytime sleep and late wakefulness in depression is a significant indicator. In dementia, affect is usually stable and may vary from disinhibited to vegetative, with task completion muddled by the inability to plan a sequence of steps, self-monitor, and adapt to cues. The mechanics of speech are normal although there may be an inability to find or recall words.

Delirium is always related to the altered physiologic or psychological processes associated with either drug ingestion/withdrawal or general medical conditions, whereas dementia may be caused by Alzheimer's disease (Type 1 dementia) or by conditions such as vascular changes, Lewy body disease, Pick's disease, Huntington's disease, AIDS-related dementia, and other non-AD pathology in the brain (Type 2 dementia).

Delirium may be caused by diseases of body systems other than the brain, by poisons, by fluid/electrolyte or acid/base disturbances, and by other serious, acute conditions. Infections such as urinary tract infections or pneumonia may trigger delirium in individuals with preexisting brain damage (e.g., prior strokes or dementia). Delirium is embodied by rapid changes such as from lethargy to agitation and from somnolence to euphoria with attention disruption, disorganized thinking, disorientation, and changes in sensation and perception.

The *DSM-IV-TR* (2000) states, "General medical conditions associated with delirium include central nervous system disorders (e.g., head trauma, ictal and postictal states, vascular diseases such as stroke and hypertensive encephalopathy, degenerative diseases such as Pick's disease, infection, brain tumor), metabolic disorders (e.g., renal or hepatic disease, fluid or electrolyte imbalance such as dehydration, sodium or potassium imbalance, anemia, hypoxia, hypercarbia, hypoglycemia, thiamine deficiency, hypoalbuminemia, endocrinopathy, acid-base imbalance), cardiopulmonary disorders (myocardial infarction, congestive heart failure, cardiac arrhythmia, shock, respiratory failure), and systemic illness or effects (e.g., infection such as septicemia, pneumonia, and urinary tract infection; neoplasm; severe trauma; sensory deprivation such as visual and hearing impairment; temperature dysregulation; postoperative state). Certain focal lesions of the right parietal lobe and inferomedial surface of the occipital lobe also may lead to a delirium."

Interventions

The most important intervention is accurate and comprehensive assessment and documentation of altered mental states so that a differential diagnosis can be made and appropriate treatment begun. When sundown syndrome is not related to an underlying medical condition, environmental interventions are appropriate. The patient's physical and social environment should be assessed for "zeitgebers," or time providers such as lighting appropriate to the time of day and sleep needs, window shades that may be open or closed, structured meal times, suitable visitors and visiting hours, and morning and bedtime routines. Monitor and modulate noises that are intrusive and use music or other sensory salves to soothe before bedtime. Provide opportunities for daytime activity and exposure to sunlight, confine disturbing routines to early in the day, and limit access to caffeinated beverages. Melatonin, a hormone produced by the pineal gland, declines with age. It is produced in response to dark stimulation. It is available in health food stores and may promote nighttime sleep if administered before bedtime.

MARY (KELLY) DUNN
ADRIANNE DILL LINTON

See also

Delirium
Dementia: Overview
Depression in Dementia
Depression Measurement Instruments
Sleep Disorders
Vascular and Lewy Body Dementias

Internet Resources

ICU Delirium and Cognitive Impairment Study Group
http://www.icudelirium.org/delirium/

National Guideline Clearinghouse
http://www.guideline.gov/summary/summary.aspx?doc_id=1804

Society of Critical Care Medicine
http://www.icu-usa.com/tour/medical_conditions/delirium.htm

REFERENCES

American Psychiatric Association (2000). *The diagnostic and statistical manual of mental disorders, fourth edition, text revision*. Arlington, VA: American Psychiatric Publishing, Inc.

Bachman, D., & Rabins, P. (2006). Sundowning and other temporally associated agitation states in dementia patients. *Annual Review of Medicine*, *57*, 499–511.

Burgio, L. D., Scilley, K., Hardin, J. M., & Hsu, C. (2001). Temporal patterns of disruptive vocalization in elderly nursing home residents. *International Journal of Geriatric Psychiatry*, *16*(4), 378–386.

Cardinali, D. P., Brusco, L. I., Liberczuk, C., & Furio, A. M. (2002). The use of melatonin in Alzheimer's disease. *Neuro Endocrinology Letters* (Suppl. 1), 20–23.

Dewing, J. (2000). Sundowning: Is it a syndrome? *Journal of Dementia Care*, *8*(6), 33–36.

Mahlberg, R., Kunz, D., Sutej, I., Kuhl, K. P., & Hellweg, R. (2004). Melatonin treatment of day-night rhythm disturbances and sundowning in Alzheimer's disease: An open-label pilot study using actigraphy. *Journal of Clinical Psychopharmacology*, *24*(4), 456–459.

Skjerve, A., & Nygaard, H. H. (2000). Improvement in sundowning in dementia with Lewy bodies after greatment with donepezil. *International Journal of Geriatric Psychiatry*, *15*(12),1147–1151.

Staedt, J., & Stoppe, G. (2005). Treatment of rest–activity disorders in dementia and special focus on sundowning. *International Journal of Geriatric Psychiatry*, *20*(6), 507–511.

Volicer, L., Harper, D. G., Manning, B. C., Goldstein, R., & Satlin, A. (2001). Sundowning and circadian rhythms in Alzheimer's disease. *American Journal of Psychiatry*, *158*(5), 704–711.

SUPPORT GROUPS

Support groups are a generic type of interpersonal network that, depending on objectives, initiation, leadership, and composition, may be variously described as self-help, mutual support, or treatment groups. The social and emotional bonding of individuals into networks of persons who perceive a shared fate and affirm mutual responsibilities for one another and are perceived to be experienced in the solution of challenging problems of living is a basic process observed in all stable social groups. Kinship groups are prototypic mutual-support networks that are intended to provide timely and appropriate information, practical services, and emotional support when needed. In complex, socially differentiated societies, kinship-like interpersonal networks appear in large numbers and in great variety, apparently to compensate in part for the attenuation of traditional kinship ties and the limited capacity of kin groups to provide needed support in a timely way. Data from a nationwide survey of older people also indicate that emotional support from church-related groups can be particularly important for the oldest of older adults (Krause, 2005) and that church-based support appears to have a unique positive effect in buffering stress among older African Americans (Krause, 2006).

In psychosocial terms, the essence of support groupings is the reliable availability of interpersonal networks in which participants perceive themselves to be accepted and understood and expect to receive timely information and supportive assistance in mastering problems of everyday life. Specifically, support groups provide (1) models of emotional mastery in responding to potentially traumatic events and circumstances; (2) guidance in cognitive interpretation and comparison of one's response to these events and circumstances with other members of the group perceived to be successful; (3) consensual validation of self-esteem or reinvention of the self in the face of significant challenges or loss; and (4) instrumental, palpable, practical help in securing and using resources required to cope and to adapt to one's new situation following a challenge or loss. Although research has increasingly documented the extent and variety of mutual-support groups worldwide, research documenting the outcomes and effectiveness of such groups has remained sparse.

Support groups are observed worldwide, but this kind of informal provision of informal care, particularly for aging populations, is especially common in the United States. Similar informal groups have been documented (e.g., in the United Kingdom, Holland, Poland, Yugoslavia, and Latin America) (Maddox, 1984).

Even in the United States, however, the actual number and variety of support groups, although very large, is a matter of conjecture. In the 1980s, for example, an estimated 500,000 organized support groups involving millions of persons existed. The Center for Self-Help Research at the University of California, San Francisco, estimated from various surveys in the early 1990s that 7.5 million adults participated in one or another support group designed to assist individuals facing every conceivable problem (Lieberman & Snowden, 1993). Participants were found to be predominantly White, middle-class, and middle-aged. Lifetime participation in mutual-support groups was estimated to involve 3.6% of adult men and 2.2% of adult women. One estimate suggests that in 1990, 3% of adults in the United States had attended a meeting of the more than 27,000 local chapters of Alcoholics Anonymous, a prototypic support group, in the previous year. The Alzheimer's Disease and Related Disorders Association in the 1980s published principles for creating support groups, and by the 1990s reported 221 chapters and more than 2,800 support groups in all 50 states. The Web site of the National Library of Medicine, National Institutes of Health, lists 70 links to formal support groups by disease and condition and suggests that this is a partial list that can be supplemented by consulting local libraries, health care providers, and the yellow pages under "social services organizations."

Support groups have come to be a regular component of therapeutic interventions designed to prevent illness and improve health (Macauley & Katula, 1999). Conceptually, support groupings are a component of the more general phenomena of social networking and social integration, both of which are considered to have positive implications for health and well-being (Unger, McAvay, Bruce, Berkman, & Seeman, 1999).

Although support groups appear typically to produce benign or beneficial effects, systematic research is scarce on outcomes that would assist in specifying which kinds of support are beneficial for which individuals under which circumstances. The fluidity of membership in support groups and the complex number of variables that remain uncontrolled make definitive research difficult. Additional research will continue to be required to refine decision rules for professionals regarding whether and how to use support groups to assist clients and patients. Of particular importance is knowledge about the limits of using support groups effectively and how to enhance the complementarity of formal and informal care services for older adults and their families. Further, the timing, not just the provision of emotional support, information, and practical care, may be of importance in the management of care (Ussher et al., 2006).

George L. Maddox

See also

Alzheimer's Association
Caregiver Support Groups
Group Psychotherapy

Internet Resource

http://www.nlm.nih.gov/medlineplus/ency/article/002150.htm

REFERENCES

Krause, N. (2005). Exploring age differences in the stress-buffeting function of social support. *Psychology & Aging*, *20*(4), 714–717.

Krause, N. (2006). Exploring the stress-buffeting effects of church-based and secular social support on self-rated health in late life. *Journal of Gerontology: Psychology and Social Sciences*, *61*(1), S35–S43.

Lieberman, M. A. & Snowden, L. (1993). Problems in Assessing Prevalence and Membership Characteristics of Self Help Group Participants. *The Journal of Applied Behavioral Science*, 29(2), 164-178.

Macauley, J., & Katula, J. (1999). Physical activity interventions in the elderly: Influences on physical health and psychological function. In R. Schulz, G. Maddox, & P. Lawton (Eds.), *Annual Review of Gerontology and Geriatrics* (Vol. Interventions, pp. 111–154). New York: Springer Publishing Company.

Maddox, G. L. (1984). Mutual-help groups for caregivers in the management of senile dementia: A research agenda. In J. Werthemier & M. Marios (Eds.), *Senile dementia: Outlook for the future*. New York: Alan R. Liss.

Unger, J., McAvay, G., Bruce, M., Berkman, L., & Seeman, T. (1999). Variations in the impact of social network characteristics on physical functioning in elderly persons: MacArthur studies of successful aging. *Journals of Gerontology*, *54B*, S245–S251.3.

Ussher, J. K., Butow, P., & Sandoval, M. (2006). What do cancer support groups provide which other support groups do not? The experience of peer support groups for people with cancer. *Social Science & Medicine, 62*(10), 2565–2576.

SWALLOWING DISORDERS AND ASPIRATION

Swallowing is a complex mechanism that requires the intricate coordination of several cranial nerves and a very large number of muscles of the face, mouth, pharynx, and esophagus. This enables the important physiological task of transporting liquids and firm food (i.e., the bolus) from the mouth into the esophagus while crossing a complicated anatomical region that is not only involved in swallowing but also in respiration and speech. The main causes of swallowing disorders are neuromuscular diseases (e.g., stroke), local structural abnormalities (e.g., Zenker diverticulum), and motility disorders of the upper esophageal sphincter.

Swallowing disorders occur in all age groups and can be produced by a wide variety of pathologies (i.e., neurologic and medical problems or structural abnormalities). The resulting impairment may range from very mild to life-threatening. It is, however, necessary to distinguish the effect of usual aging changes from the effects of specific diseases or degenerative changes. Indeed, nondysphagic elderly may have altered function without impairment. With increasing age, several changes can be observed: increased stiffness of the upper esophageal sphincter, progressive lengthening of the duration of the hyoid movement, and shortening of the duration of the laryngeal closure, among others. These changes are congruent with a general impression that aging per se does not lead to pathology, but it puts the aging person at risk for swallowing problems if some pathology is present. As such, aspiration is likely to be the result of pathology and not due to normal aging.

Dysphagia (i.e., difficulty in swallowing) is a surprisingly common symptom and one that spans all ages. It is helpful to divide dysphagia into two types: *oropharyngeal* and *esophageal*. Dysphagia secondary to a lesion above or proximal to the esophagus is called oropharyngeal dysphagia. This symptom is often characterized as a transfer problem: the patient has trouble transferring food from the mouth into the pharynx and esophagus. Patients with esophageal dysphagia have difficulty transporting food down the esophagus once the bolus has been successfully transferred through the pharynx. In many cases, dysphagia occurs in the setting of other symptoms, but it may also occur solitarily.

A patient who complains about difficulties swallowing certain foods or liquids may have a swallowing disorder. Globus sensation or a feeling of a lump in the throat is usually not related to swallowing and should not be confused with dysphagia. Regurgitation, or the return of undigested food or liquid, may have different causes; delayed regurgitation of undigested food is suggestive of a Zenker diverticulum. Odynophagia, or painful swallowing, is most commonly due to acute disorders such as a pharyngitis. Aspiration is defined as food (i.e.., liquids or solids) entering the airway below the level of the true vocal cords (Logemann, 1998; Lundy et al., 1999). Coughing usually indicates that liquid or food has entered the airway, but some patients do not cough when they aspirate (i.e., "silent aspiration"). A gurgly voice quality after swallowing indicates that food remains in the larynx.

Evaluation

Investigation of a swallowing disorder requires a multidisciplinary approach. It should always start with a careful clinical evaluation, preferably done by a speech-language pathologist.

Radiologic imaging is central to evaluating, diagnosing, guiding the management, and assessing the interventions for swallowing disorders (Jones & Donner, 1991). A modified barium swallow/videofluorographic study of swallowing (Logemann, 1998) provides vital information for the management of patients with aspiration. The moment of aspiration in relation to the pharyngeal stage of deglutition (before, during, or after deglutition) (Logemann, 1998) seems to be crucial.

Fiberoptic Endoscopic Evaluation of Swallowing with Sensory Testing (FEEST) can provide important information concerning the safety of deglutition. The main advantages of a FEEST are that it can be performed bedside, offer direct visualization of structures and sensory testing, and carry no radiation exposure. During the pharyngeal phase of swallowing, however, the view is obscured. It should be considered complementary to a radiologic examination.

Manometry is only useful in combination with radiology, a correlation best obtained with manofluoroscopy. This technique simultaneously records pressure at different heights, anatomic events, and bolus transit on a single videoscreen along with timing numbers. It may be an important tool in assessing the indication for extramucosal myotomy of the upper esophageal sphincter.

Management

Once a clear insight into the patient's swallowing problem in terms of anatomic or physiologic abnormalities has been obtained, treatment can be considered. This involves a team approach and an individualized treatment plan (Leonard & Kendall, 1997; Logemann, 1999), but there are some general rules when dealing with elders who have swallowing problems, as follows:

- No attempt to feed orally should be made unless the patient is fully alert.
- Maintain a calm environment because the patient should not become distracted.
- Sit next to the patient, at the same height, and ensure that the food is placed within his or her visual field. An upright position is best with the head in the midline.
- Allow sufficient time.
- Provide small quantities.
- Observe the patient and assist when necessary. Self-feeding sometimes improves swallowing.
- Offer another spoonful or forkful of food only when the previous one is swallowed. Do not presume that another spoonful will help move the previous one. Place the food in the mouth centrally or at the best side (i.e., left side if there is a right-sided paresis).
- Be sure that the patient's mouth and teeth (or dentures) are clean before eating; check for any oral residue after the meal.
- Don't encourage the patient to speak during mealtime. The person assisting should not initiate a conversation. Limit the talking to short clear messages such as "open your mouth, chew," and so forth.
- Ask for advice concerning the utensils to use during eating.

Attention should also be given to medication intake. Polypharmacy can be a major problem in the elderly. Some drugs (e.g., neuroleptics) may interfere with normal deglutition whereas others pose a hazard when they are not at once transported into the stomach (e.g., iron tablets). Medications should, therefore, always be taken in an upright position with plenty of water.

Additional advice pertaining to medications includes the following:

- Never swallow more than one pill at a time.
- Begin by swallowing some water to moisten the mouth, followed by each pill and water; end with a glass of water.
- Do not take medications just before lying down, instead wait 5 to 10 minutes.
- Medication ordered for bedtime in fact means before bedtime.
- Even a bedridden person should be placed in an upright position and kept in this position for at least 5 to 10 minutes after the ingestion.

Oral medication is not always easy to swallow, and people often crush or open medication. Enteric-coated or extended-release forms cannot be crushed without losing their specific pharmacologic properties. Medications mixed with food should always be given immediately after mixing to secure the integrity of the active component.

Liquid forms of medications may ease administration, but it is important when switching to a liquid form to check the dose. In some cases, effervescent and orally disintegrating tablets may also be available. Non-oral routes, like transdermal preparations, are also important alternatives.

The interdisciplinary team should also recommend appropriate treatments such as compensatory measures, changes in food consistency, swallow maneuvers, exercises, medication, and endoscopic or surgical procedures. Postural changes can be regarded as compensatory measures. A chin-down position is recommended when there is a delay in triggering the pharyngeal phase; when there is a unilateral pharyngeal weakness, the head should be turned to the weaker side.

The patient should receive the food consistency best adapted to his or her situation. Mixed or pureed food is advisable if there is a chewing problem, or in the healing stages postoperatively; liquids are indicated when there is an upper esophageal sphincter opening problem. In case of tongue and pharyngeal weakness, it may be necessary to alternate liquid and solid. A food thickener can be used in patients with a problem swallowing liquids.

Swallowing maneuvers require more cooperation and understanding from the patient. Among the most frequently used are as follows:

- The Mendelsohn maneuver, which prolongs the upper esophageal sphincter opening. In this maneuver, the patient is instructed to voluntarily elevate and hold the larynx in an upright position.
- The effortful swallow, which enhances the tongue thrust.
- The supraglottic technique, which teaches the patient to close the true vocal cords before and during the swallow and to clear any residue that may have entered the laryngeal vestibule. This technique is designed for patients with reduced laryngeal closure who are at risk of aspiration. It involves taking a deep breath, holding the breath while swallowing, and coughing immediately after the swallow. The supersupraglottic swallow is very similar to the supraglottic technique with the addition of bearing down during breath-holding.
- Certain exercises, when performed on a regular basis, can also improve swallowing.

The Shaker exercises are designed to improve the duration and width of the upper esophageal sphincter (Shaker et al., 1997). A second type consists of strengthening exercises for the tongue.

In rare cases, medication can improve swallowing (e.g., in patients with myasthenia gravis). Several surgical procedures can improve swallowing disorders. For significant cases of upper esophageal sphincter dysfunction, an extramucosal myotomy of this sphincter may help correct the problem. A Zenker diverticulum can be treated by a diverticulopexy in combination with extramucosal myotomy; endoscopic treatment is an alternative. Medialization of a paralyzed vocal cord can be performed through an injection or an implant technique. This intervention can be proposed for voice improvement and to avoid aspiration. If oral feeding places the patient at too great a risk, percutaneous endoscopic gastrostomy (PEG) tube-feeding should be considered a temporary solution to allow recuperation and revalidation to take place without the burden of a nasogastric tube.

EDDY DEJAEGER
ANN GOELEVEN

See also
Feeding: Non-Oral

Internet Resources
American Speech-Language-Hearing Association
http://www.asha.org

Dysphagia Research Society
http://www.dysphagiaresearch.org

Dysphagia Resource Center
http://www.dysphagia.com

European Study Group for Dysphagia and Globus
http://www.egdg.org

International Society for Diseases of the Esophagus
http://www.isde.net

REFERENCES

Jones, B., & Donner, M. W. (1991). *Normal and abnormal swallowing: Imaging in diagnosis and therapy*. New York: Springer-Verlag.

Leonard, R., & Kendall, K. (1997). *Dysphagia assessment and treatment planning: A team approach*. Baltimore: Singular Publishing Group, Inc.

Logemann, J. (1998). *Evaluation and treatment of swallowing disorders*. Austin: Pro-Ed, Inc.

Logemann, J. (1999). Behavioral management for oropharyngeal dysphagia. *Folia Phoniatrica et Logopaedica*, *54*(4–5), 199–212.

Lundy, D., Smith, C., Colangelo, L., Sullivan, P., Logemann, J., Lazarus,C., et al. (1999). Aspiration: Cause and implications. *Otolaryngology—Head and neck surgery*, *120*(4), 474–478.

Shaker, R., Kern, M., Bardan, E., Taylor, A., Stewart, E. T., Hoffmann, R. G., et al. (1997). Augmentation of deglutitive upper esophageal sphincter opening in the elderly by exercise. *American Journal of Physiology*, *272*(35), G1518–G1522.

T

TASTE

See
Sensory Change/Loss: Smell and Taste

TAX POLICY

Taxation is an increasingly important but often overlooked aspect of federal, state, and local policies for older adults. The tendency has been to focus on budget outlays or direct expenditures, such as Social Security and Medicare, and less on tax expenditures (tax credits, deductions, and exemptions). However, federal tax expenditures deserve greater attention, if only because they are equal to about 75% of federal budget outlays (Howard, 1995). Federal tax policies, rather than state and local policies, also have commanded center stage. Over the past 30 years, however, greater scrutiny has gradually been accorded to the impacts of tax policies at all governmental levels on older adults and on the larger society.

In the mid-20th century, rationales for special tax treatment of the elderly included higher rates of poverty, being categorized as "deserving poor," and "payback" for their contributions to society. Consequently, an additional exemption was enacted for persons aged 65 and older; Social Security benefits, and often other retirement income, were exempted from federal and state income taxes. Older adults also benefited from tax policies available to other age groups, such as deductions for itemized medical expenses above a certain proportion of income. Often these policies have been especially important for the elderly, given their personal expenditure patterns.

Federal Tax Policy

In the 1980s, the special tax status of older persons began to erode due to concerns about the viability of Social Security, debates about "greedy geezers" and "intergenerational equity," and the $18 billion in lost revenue of the additional age-based exemption and exclusion of Social Security benefits from taxation. The 1983 Social Security reforms established taxation of benefits, with differential (but unindexed) thresholds for singles and couples; tax revenues were earmarked for the Old Age, Survivors and Disability Insurance trust fund. The Tax Reform Act of 1986 eliminated the age-based exemption, but doubled the personal exemption and boosted the standard deduction for all taxpayers. In the 1990s, both the percentage and thresholds of Social Security benefits subject to income tax were increased. The earlier calls for means-testing Social Security benefits gradually subsided as proposals for privatization escalated.

Also reflecting shifts from age-based preferential treatment were changes in the one-time exclusion on capital gains from the sale of the primary residence of those aged 55 and older. This policy was changed to cover all homeowners, with capital gains exclusions of $250,000 for singles and $500,000 for couples. Recent changes in the tax laws also lowered the capital gains rate on the sale of homes and dividend income to 15%. This provision has enabled older homeowners to sell their homes and retain more of the proceeds for other expenses, such as long-term care. However, other recent tax code changes may be less beneficial for older Americans because many do not itemize deductions or even have income tax liability (Gist, 2002). Among taxpayers aged 50 and older, dividend income is heavily concentrated among those with incomes above $100,000 (Gist, 2003).

Other policies of potential benefit for the elderly and non-elderly alike have included raising the threshold for estate taxes, first to $600,000 and gradually to $1 million; and providing dependent care tax assistance for employed taxpayers caring for elderly spouses, parents, and children. More recently, the upper limits for estates were changed; by the year 2009, the amount excluded will be \$3.5 million. Additionally, the tax rate dropped by 10%. However, due to a "sunset" provision, these changes will revert to the smaller threshold and higher tax rate in 2010, unless they are made permanent. This ambiguity makes estate planning problematic for individuals and also affects those states whose inheritance laws conform with the federal estate tax policies.

Tax relief for long-term care expenses also has been increased by allowing the costs of long-term care insurance premiums and of home care to be itemized and deducted by either a family caregiver or the care recipient, under the extraordinary medical expenditures provision. This approach has been seen as more politically viable than directly providing a federal long-term care benefit, as was proposed during the Clinton administration. However, tax credits in place of tax deductions might induce more middle-income individuals to purchase long-term care insurance.

A major tax expenditure for pensions (employer, self-employed, and individual plans such as Keoghs and Individual Retirement Accounts [IRAs]) permits contributions to be deducted from present tax obligations by employers and by the future elderly population. The 1986 tax law restricted the levels of both employer and employee pension contributions, as well as the amount of tax-deferred contributions to IRAs for higher-income individuals enrolled in an employer plan. Married couples were subsequently allowed to contribute more to IRAs. A major revamping of the tax code in 2001 substantially increased the annual maximum contributions to IRAs and employer-sponsored retirement plans, such as 401(k)s, with special "catch-up" incentives for employees aged 50 and older to contribute to save more for their retirement.

These pension-related tax expenditures, costing \$123 billion in lost revenues in 2003 and adding to the national deficit, have engendered discussions about which income groups and types of employees (public or private) benefit most from these exclusions. The exclusion of benefit contributions from employee taxation appears to benefit middle-income earners and public sector workers, especially federal employees. Proposals to tax the value of pensions, all or in part, as well as taxing the value of employer-provided health benefits, have been put forth primarily as a way of ensuring greater equity (Salisbury, 1993; Penner, 2000).

State and Local Tax Policies

State and local governments have enacted a wide array of tax policies that affect the income of the elderly. Older adults receive more subnational tax preferences than the general population (Mackey & Carter, 1994; Penner, 2000). The low visibility of these policies has thus far forestalled any calls for repeals of these preferences (Mackey, 1995; Mackey & Carter, 1994).

As would be expected, great variations exist among the states, especially in income tax policy; 7 states have no personal income tax, while 2 tax only interest and dividend income. Forty-one states and the District of Columbia exclude some amount of pension income; 26 provide full exclusion of Social Security benefits, and none tax Railroad Retirement income. Nearly all states with a personal income tax exclude some pension benefits of retired public employees; two-fifths exempt a portion of all pension income. Besides this special treatment, estate and inheritance taxes have been cut, often an attempt by states to become retirement havens (National Conference of State Legislatures, 2003). Most conform to the national capital gains tax on dividend income and sale of the principal residence.

In addition, slightly more than half of the states provide family care incentives to taxpayers, modeled after the federal Dependent Care Assistance Program. A handful of states also have enacted deductions or exemptions for taxpayers caring for an older or disabled person. California has enacted a \$500 tax credit for caregiving, which is of particular benefit to lower-income households. Furthermore, 34 states have legislated long-term care tax incentives, with 7 offering tax credits. Michigan offers both tax deductions and tax credits.

The property tax is usually viewed as the most onerous for older adults in comparison with younger households (Reschovsky, 1994). In retirement, the ratio of property wealth tends to rise as income falls, increasing the property tax burden. This burden, often perceived as the least fair among common taxes and which led to the "tax revolt" in 24 states, has been exacerbated by rapid increases in residential property values for much of the past 3 decades. This tax generates 75% of county and half of municipal tax revenues. Most visible in its financing of public education, it is often the only significant tax paid by middle-class older adults to support state and local services (Mackey & Carter, 1994).

Every state except Wyoming has either a homestead exemption or "circuit breaker" program of tax relief. Forty states and the District of Columbia have enacted homestead exemptions and credits that reduce the amount of assessed value subject to taxation (Baer, 2003). Twenty-four favor seniors by limiting participation to that age group or providing them with greater benefits than are available to the general population. Four states leave this up to the discretion of their localities; 16 require elderly households to meet income criteria.

"Circuit breakers" in 35 states and the District of Columbia prevent property taxes from placing an overload on taxpayers (Baer, 2003). Unlike the homestead programs, this tax relief is carefully targeted to low- and moderate-income taxpayers and can benefit both homeowners and renters. Nearly half of the states limit eligibility to the elderly and, in some cases, disabled homeowners to defer tax payments. If income guidelines are met, part or all of those taxes can be postponed until the owner's death or the sale of the property. California allows older adults who sell their home to transfer their existing, and generally lower, property tax rates to a new in-state location in 8 counties having reciprocity. Additionally, a handful of states have enacted property tax freezes and abatements for home repairs, usually restricted to the aged. Older adults' knowledge of these programs is considerably less than their familiarity with the homestead program (Baer, 1998).

A final category of state and local taxes is the sales tax, a major source of revenue for nearly all states, counties, and cities. In 2000, 21 states cut this tax, generally benefiting low-income households. A very few states provide a credit or rebate to older adults for part of the sales tax paid. Perhaps the greatest sales tax boon for older adults is the exemption for food and especially prescription drugs, because they purchase more prescriptions than younger persons do. Because older adults characteristically spend a higher proportion of their income on such nontaxable items, their sales tax burden is lowered (Mackey & Carter, 1994). In 2002, 34 states and the District of Columbia initiated the Streamlined Sales and Use Tax Agreement, designed to make sales taxes more uniform across the states. This voluntary pact is designed to create standardized definitions of drugs, food, clothing, and durable medical equipment, among other proposals (Tubering, 2003). Because these are important expenditures for the elderly, enactment of these provisions by state legislatures would be beneficial for older adults who live in more than one state or who migrate to other states during their later years.

Basic Issues Arising from Tax Preferences for Older Adults

Basic issues are raised by the use of tax expenditures, not the least of which is that the actual costs of an aging society are hard to calculate. The extent of forgone tax revenues is not well documented, especially at the subnational level. Most state legislature have not yet analyzed how tax benefits for the elderly now affect or will impact their revenue systems in the future (Mackey, 1995).

Another issue is intergenerational and intragenerational equity. Younger households with the same level of income as older households can end up paying more taxes due to various exclusions benefiting the elderly (Penner, 2000). Many tax policies, particularly because deductions rather than tax credits are used most frequently, are more beneficial to upper-income elderly than to lower-income older persons. The more extensive taxation of

Social Security benefits enacted in the 1980s and 1990s has tended to right that imbalance, but tax-preferred pensions still are less likely to benefit low-income families, who are more likely to work for employers not providing such benefits (Salisbury, 1993). Furthermore, state property tax relief programs generally favor homeowners over renters, the segment of the older population who are most likely to pay excessive costs for housing and therefore need greater assistance (Liebig, 1998).

Other issues spring from the relative efficiency of tax laws in promoting the welfare of those older adults who need help the most. These include questions of whether an increase in direct spending on low-income older adults or using tax credits would be more effective, or whether age is an appropriate factor on which to base tax relief. In addition, little is known about the effectiveness of many of these provisions in increasing the well-being of older adults. For example, we do not know if property tax breaks help older persons keep their homes and age in place or cause them to maintain their homes at considerable financial and personal health risk, or if federal and state dependent care tax assistance helps older adults maintain relative independence and enhanced quality of life and avoid nursing home placement.

Tax policies can be an important mechanism for achieving important policy objectives, such as homeownership and ensuring access to health care. Major questions, however, need to be addressed regarding the impact of tax expenditures on the general welfare of older adults, on different subgroups of the aged, and on society. As the baby boomers enter their retirement years, these issues will become increasingly crucial, meriting the attention of citizens and policy makers at all levels of government.

PHOEBE S. LIEBIG

REFERENCES

Baer, D. (1998). *Awareness and popularity of property tax relief programs*. Washington, DC: AARP Public Policy Institute.

Baer, D. (2003). *State programs and practices for reducing residential property taxes*. Washington, DC: AARP Public Policy Institute.

Gist, J. (2002). Profile of older taxpayers. *PPI Data Digest*, *76*, 1–4. Washington, DC: AARP Public Policy Institute.

Gist, J. (2003). Repealing the tax on dividends: Benefits and costs. *PPI Data Digest*, *84*, 1–6. Washington, DC: AARP Public Policy Institute.

Howard, D. (1995). Testing the tools approach: Tax expenditures versus direct expenditures. *Public Administration Review*, *55*(5), 439–447.

Liebig, P. S. (1998). Housing and supportive services for the elderly: Intragenerational perspectives and options. In J. S. Steckenrider, & T. M. Parrott (Eds.), *New directions in old-age policies.* Albany, NY: SUNY Press.

Mackey, S. (1995, May). Time to talk about senior tax breaks? *State legislatures*, 12–13.

Mackey, S., & Carter, K. (1994). *State tax policy and senior citizens* (2nd ed.). Denver: National Conference of State Legislatures.

National Conference of State Legislatures, Fiscal Affairs Program (2003). *State personal income taxes on pensions and retirement income: Tax year 2003.*

Penner, R. B. (2000). Tax benefits for the elderly (Occasional paper). Washington, DC: Urban Institute.

Reschovsky, A. (1994). *Do the elderly face high property tax burdens?* Washington, DC: AARP Public Policy Institute.

Salisbury, D. (1993). *Pension tax expenditures: Are they worth the cost?* (Issue brief No. 134). Washington, DC: Employee Benefit Research Institute.

Tubering, C. (2003, February). A blueprint for streamlining sales taxes. *State legislatures*, 12–16.

TEAMS

See
Geriatric Interdisiplinary Team Training (GITT)

TECHNOLOGY

The world has never experienced a period in which technological advancements are occurring as rapidly as they are now, and this trend is likely to continue. Technology also crosses many domains and ranges from high-tech microprocessor chips embedded in appliances to "low-tech" solutions such as well-balanced footwear to minimize falls. Based on research conducted by the Center for Aging Services Technologies (CAST), which is a joint collaboration between the American Association of Homes and Services for the Aging and Intel's Proactive Health Research division, technologies for elders can be divided into four broad categories (CAST, 2003).

1. *Enabling technologies.* These devices and systems are designed to support older adults in continuing to live active and productive lives at home, which supports the concept of aging in place. These include some of the Smart-house technologies, which can automatically recognize people, unlock doors and turn on lights before you reach the house, remind people to take medications, passively monitor presence or absence of routine activities such as using the bathroom or kitchen, may sense when you are ready to get out of bed and proactively turn on lights to reduce the risk of falls. Other advances include devices that can detect subtle changes in gait, which may signal a change in condition of an individual with Parkinson's or Alzheimer's disease. Not all products are home-based. Some use Global Positioning Systems (GPS) with cell phones or handheld computers (personal digital assistant [PDA]) to help people move successfully from one destination to another in the community. Some of these systems are able to learn an individual's normal travel patterns, and will alert them if they take a wrong turn or get off at the wrong bus stop and then help them to get to the desired location. Also included in this category are technologies that support maintaining a healthy lifestyle, which includes eating a moderated, balanced diet and getting regular exercise. As computers become more ubiquitous in the home, they may help plan healthy meals that address weight or other dietary restrictions and automatically generate grocery lists, sending them directly to the store to be filled and delivered. Exercise equipment will automatically weigh each user and prescribe a set regime to help maintain his or her ideal weight. This equipment may also track vital signs while exercising to both maximize performance and detect potential or emerging health problems.
2. *Operational technologies.* This category mainly focuses on increasing efficiency for care providers and reducing the potential for error. Preventable adverse medical errors (AMEs) are projected to cost between $17 billion and $29 billion annually (Kohn, Corrigan, & Donaldson, 1999). While not all of this relates to older adults, older adults generally account for 60% or more of all hospital patient days and therefore are more susceptible to medical errors. Current regulatory processes focus heavily on documentation of the provision of care, so staff spend a substantial portion of their work time documenting care as opposed to providing it. New systems that automatically record care as it is delivered are not only more efficient, they are also more accurate. Some current systems rely on bar-code technology but in the future they will likely be based on fingerprints (which do not require the patient/resident to wear an institutional wristband). There are also systems designed to compensate for different disabilities of individuals receiving care. For instance, people with dementia may have a difficult time learning and remembering how to use a call-bell system to call for assistance when they need it. Automatic systems that use motion sensors that feed information into personalized database programs can alert caregivers when someone has gone into the bathroom more than usual or stays in the bathroom too long. Bed and chair sensors can identify when someone who is at risk of falling is trying to get up without assistance or has experienced an episode of incontinence. Motion sensors connected to the bed can determine sleep patterns and level of restlessness at night, which may be related to undertreated pain. Robots are being used in hospitals and long-term care settings to deliver medications, help monitor vital signs, take residents to desired locations, and provide company. These innovations can improve the quality of care and support residents' being as independent as possible.
3. *Connective technologies.* These devices are used to facilitate communication between family and

friends, caregivers, and medical professionals. Telephones, radios, and televisions are the older versions of connective technologies, and many of the newer devices build on this same technology. Cameras can be connected to computers to allow distant relatives to participate in important family events or just be part of the daily routine. Many care facilities are installing computers, and residents are emailing their grandchildren and staying in touch better than when they lived at home. Other systems allow each resident to build his or her own Web page of preferred activities, be it music, card games, old television shows, or current news. Some systems can be customized to tell caregivers about resident preferences related to the provision of care. Other devices, generally dubbed "granny-cams," are used to unobtrusively monitor a setting if there are concerns about potential abuse. These cameras may be hidden in stuffed animals, fans, or other everyday objects to reduce their obtrusiveness. Connective technologies overlap with some of the enabling technologies, in that systems where sensors track activities such as getting up or taking medications can also be linked to Web sites, where families or caregivers can check in on a regular basis to make sure the day is going smoothly.

4. *Telemedicine*. There is also overlap between the previous categories and telemedicine, but the focus here is on transmitting medical information to health care providers who can, in turn, be more efficient in delivering care. Many of the chronic conditions elders face need routine monitoring, which is currently typically provided by a home-health nurse. In rural areas in particular, this makes for inefficient care because staff may drive 1 hour or more for a 10-minute checkup. In urban areas, seniors may be uncomfortable using public transportation and thus delay getting routine checkups, allowing potentially unstable conditions to go unmonitored. By using cameras and various monitoring devices (including blood glucose measurement, spirometry, ECG, blood pressure, respiration, and more), information about a broad range of conditions can be efficiently and accurately relayed to medical professionals. Several studies have shown that the use of telehealth can reduce emergency-room visits, hospitalizations, and improve the quality of care (Bolch, 2004; CAST, 2003). Because of its efficiency, telemedicine may actually increase the amount of time and/or frequency patients spend with care providers, electronically. Checking in on a daily basis is easy if all you have to do is sit in your favorite chair in the living room and dial up (Bolch, 2004).

The main challenge to face in the coming decades is being able to afford high quality care with a rapidly aging cohort. Although the baby boomers are generally healthier than previous generations, the aging process brings a range of impairments that requires medical attention. In the future, technologies will be focused more on prevention than treatment and on staying home as opposed to relocating because these strategies are much more cost-effective and lead to higher quality of life (CAST, 2003).

MARGARET P. CALKINS

See also
Information Technology

Internet Resources
ABLEDATA
http://www.abledata.com

CAST Web site
http://www.agingtech.org/index.aspx

Duke Smart House
http://www.smarthouse.duke.edu/smartcentral/index.php

Technology for Long-Term Care
http://www.TechforLTC.org

REFERENCES

Bolch, E. B. (2004). America's health care system in crisis: The case for telemedicine. *Caring*, 6–11.

CAST (2003). *Progress and possibilities: State of technologies and aging services*. Washington, DC:

Center for Aging Services Technologies (CAST), American Association of Homes and Services for the Aging.

Kohn, L., Corrigan, J., & Donaldson, M. (Eds). (1999). *To err is human: Building a safer health system*: Washington, DC: Institute of Medicine, Committee on Quality of Healthcare.

THERAPEUTIC RECREATION SPECIALISTS AND RECREATION THERAPISTS

The terms *therapeutic recreation specialist* and *recreation therapist*, used interchangeably, describe bachelor or master's level professionals with academic preparation in leisure and therapeutic recreation theory and practice.

Geriatric-service settings that benefit from the expertise of therapeutic recreation specialists include long-term-care, hospice, assisted-living, and congregate housing; dementia care; physical rehabilitation; respite care; geriatric day care; geropsychiatric clinics; senior citizens' activity programs; municipal recreation programs; and intergenerational programs (Carter, Van Andel, and Robb, 2003). Recreation specialists are knowledgeable about physical, social, cognitive, and psychological problems commonly associated with aging; recognize the critical importance of health promotion and maintenance; and utilize meaningful recreation and leisure as both a means and an end for achieving a reasonable quality of life. Recreational therapists know how to assess behavior, design appropriate adaptations and interventions that fit clients' needs and interests, and evaluate their effectiveness.

Modalities common in therapeutic recreation programming for older persons include remotivation, resocialization, reminiscence, expressive arts, movement and music, stress management, assertiveness training, physical exercise, cognitive retraining, reality orientation, sensory programs, behavior management, pet-assisted therapy, horticulture and therapeutic gardening, aquatics, travel, community service, special-interest groups (e.g., hobbies, collections), and computer-technology activities (Carter, Van Andel, & Robb, 2003).

Approximately 24,000 individuals practiced therapeutic recreation in the United States in 2004 (Bureau of Labor Statistics, 2006). The National Council for Therapeutic Recreation Certification (NCTRC), the credentialing agency, reports that approximately 15,000 individuals are currently Certified Therapeutic Recreation Specialists (CTRS). Candidates for testing and certification must have at least a bachelor's degree in therapeutic recreation or recreation with a specialization in therapeutic recreation, specific courses in recreation/leisure theory, therapeutic recreation theory, abnormal psychology, anatomy and physiology, growth and development, and other human service disciplines, and an internship with a CTRS. Certification is not always required in clinical settings.

An *activities specialist* or *recreation specialist* works in recreation programs but is not required to have a bachelor's degree in therapeutic recreation or national certification.

Individuals with degrees in related fields can qualify to take the certification exam, but additional course work and experience are required. NCTRC is recognized by the National Commission for Certifying Agencies (NCCA) for compliance with high standards of quality and integrity in the certification and competency-assurance process that serves the interests of the public, employers, and certificants. The National Association of Activity Professionals, an industry-supported association, focuses on support and training for activities directors in nursing homes who lack a college degree or who have degrees in fields not specific to therapeutic recreation. Its membership is open to CTRSs as well. All associations have the same goal: to promote quality recreation programming for long-term-care residents.

Nursing homes receiving Medicaid or Medicare funding must offer planned and organized recreation/activity services that address each resident's individual needs and interests. Resident-focused services include leisure assessments, participation in care planning, program depth and breadth, and documentation of residents' progress toward treatment goals. Federal regulations do not require that recreational therapists working in nursing homes be baccalaureate-prepared or nationally certified. Nursing-home operators/administrators determine who is better prepared to provide recreational services to a particular patient population. State surveyors, using the Centers for Medicare/Medicaid Services (CMS) guidelines, hold the agency accountable for quality of care. Activities personnel complete the Minimum Data Set (MDS), the nationally used interdisciplinary assessment tool in long-term care. Some CTRSs complete a special section of the MDS (i.e., Section T) that identifies further, more specific need for therapeutic recreation as treatment. The National Therapeutic Recreation Society (NTRS) and the American Therapeutic Recreation Association (ATRA) encourage employment of CTRSs in long-term care, especially in those agencies that also have subacute and rehabilitation services or specialized dementia care.

The goal of assisted-living facilities is to help residents remain as active and independent as possible, providing supportive services as needed. Many assisted-living agencies also offer dementia care. Proposed industry standards for assisted living recognize the value of structured and organized recreation services based on a well-developed service plan that identifies, similar to treatment plans in long-term care, the needs of each resident. As in long-term care, assisted-living facilities are not required to hire a CTRS, but the same benefits to residents must apply and should be an incentive to hire qualified, well-prepared professionals in consultant or full-time positions.

The care of dementia patients in special units, day care, and general psychiatric hospitals requires professional skills well suited to therapeutic recreation specialists. Because the activity level of patients in the early and middle stages of Alzheimer's disease remains high, treatment should not overstimulate an easily confused patient but, instead, fully utilize all the residual strengths and cognitive abilities. Therapeutic recreation specialists understand the degenerative nature of dementia and provide structured and creative activities that tap into residents' past interests, keep social connections with family and friends at their optimal level, and monitor cognitive functioning so that new adaptations to the environment can be made.

Recreation employees without specialized educational training may provide senior programming in community recreation settings, senior centers, and retirement communities. Under the purview of a CTRS, however, programs operate within a health-promotion/disease-prevention model. Activities are designed to maintain high levels of fitness, emotional well-being, intellectual stimulation, and social interaction. Drawing on research that elders continue to learn and expand their areas of interest, activities that stimulate new learning and maximize the use of existing skills are stressed.

Leisure education, a standard programming technique used by therapeutic recreation specialists, helps program participants to understand the value of leisure and recreation and to develop or maintain a healthy leisure lifestyle. Education- and service-oriented activities complement social opportunities and physical activity to create a well-rounded, solid program foundation. Seniors in these settings are encouraged to contribute to the community at large and to their peers in ways that support meaningfulness in later life. Because leisure implies a level of personal freedom, motivation from within, and a desire to deepen personal happiness and life satisfaction, the role of the therapeutic recreation specialist in promoting the quality of life is essential.

CATHERINE O'KEEFE

See also

Assisted Living
Leisure Programs
Nursing Homes

Internet Resources

American Therapeutic Recreation Society
http://www.atra-tr.org

The Bureau of Labor Statistics
http://www.bls.gov

The National Association for Activity Professionals
http://www.thenaap.com

The National Center for Assisted Living
http://www.ncal.org

The National Commission for Certifying Agencies
http://www.noca.org/ncca

The National Council for Therapeutic Recreation Certification
http://www.nctrc.org

The National Therapeutic Recreation Society
http://www.nrpa.org/ntrs

REFERENCES

Bureau of Labor Statistics. (2006). *Occupational Outlook Handbook, 2006-07 Edition, Recreation Workers*. Washington DC: U.S. Department of Labor.

Carter, M. J., Van Andel, G., & Robb, G. (2003). *Therapeutic recreation: A practical approach* (3rd ed.). IL: Waveland Press, Inc.

TIME

Time and temporality are central to analyses of aging, the life course, and transitions along the way. Both concepts are essential to personal development and the study of aging processes, yet both remain elusive: the more purposely scrutinized, the more problematic to pin down. Since William James's benchmark overview in his *Principles of Psychology* (1890), virtually all temporal researchers have agreed that the experience of time is distinct from time's role in the physical world (Modrell, 2002). As James observed, because the experience of time is a synthetic mental construct, temporal grounding is thought to be key to personal organization, subjective well-being, and one of those psychological processes subject to displacement by off-setting events, be they good or ill. Further, the experience of time is widely thought to shift and evolve over the course of life, with the nature and pace of activity, duration of events, types of engagement, and the ways in which meaning is created.

Scholarly consideration of temporality is often an implicit reflection of chronological time keeping, is paradigm-specific, or revolves around time cast in one of two ways. Time is viewed either as an exogenous factor grounded in cosmological evolution and the directionality of an expanding universe or as an endogenous process based on properties of the system in question, whether that be a physical process, an organism, individual, or cultural system. Examination of time and temporality in aging research has focused on (1) time as an unidirectional index of age-related changes; (2) temporal orientation as a function of biological, psychological, or social change; (3) temporality as a consequence of personality factors, social involvements, or awareness of aging; and (4) shifts in sense of futurity as a concomitant of aging (Hendricks, 2001).

Cross Disciplinary Analyses

Explorations of temporal aspects of aging-related processes are found in the physical, biological, and medical sciences; in psychology; and in an array of social and cultural investigations. In the first case, there is no doubt that life has definite rhythms and periodicities embedded in the very "stuff" of life. Indeed, many facets of our biological clocks seem to oscillate from within and demonstrate diurnal patterns, evidencing 24-hour cycles or longer variations. At a physiological level, these biological clocks are part and parcel of temporal experience and there are no fewer than two dozen such rhythms emerging from micro- and macro-level physiological processes. Recurrent metabolic cycles of cellular and bodily functions or the light–dark cycle of photoperiod effects provide elemental temporal pacemakers marking sequelae or time passage. Circadian rhythms fluctuate on 24-hour cycles emanating from within the organism, but they are also capable of being reset. For example, the daily run of hormonal, neurological, and metabolic functions—such as sleep, breathing, hunger, temperature, and even cognitive variations, or monthly events such as estrous cycles—can be offset and recalibrated by cognition, stress, or environmental conditions. The legendary "jet lag" is representative of a disruption in temporal integration, followed by a recalibrated sleep cycle, and is a ready case in point illustrative of how change may be imposed. Underlying each and posing as possible causal agents are enzyme activation and inhibition, oxidative metabolism in the brain, brain rhythms, ionic diffusion across cell membranes, RNA synthesis, or hypothalamus regulatory activity, to name but a few of the substrates implicated.

The presence of diverse biological rhythms suggests emergent harmonic periodicities, perhaps based on fundamental photo- or thermal periods, which—although they may not be dependent on cognition for their existence—do involve cognition and reflection if they have meaning for temporal awareness. Yet, even without mentation, biological cycles may be the ontogenesis of temporal reckoning. Because physiological periodicities are thought to help synchronize inherent biotemporality with psychological and social time frames, disruption of these regularities by stress, suppressors, or disease may have far-reaching effects on all components of temporal orientation (Hendricks, 2001).

Despite the physiological substrate involved in time's composition, no sense organ exists to help sense time the way other stimuli are sensed. This is the case despite evidence that hippocampal or frontal lobe damage is disruptive of temporality (van der Meer, 2006). That is not to say that psychological factors are not involved. For more than 120 years, psychologists have studied time, temporal perception, and temporal orientation as other sensory processes are studied without having a definitive physical stimulus involved. There is reasonable consensus that among the psychological facets of time orientation, perceptual and cognitive dimensions as well as internal and external phenomena are involved. Sense of time is recognized as reflecting a number of psychological characteristics, including sensorimotor skills, processing speeds, affective states, activity levels, motivation, memory and reminiscence, as well as other functions carried out in the cerebral cortex (Roeckelein, 2000). A battery of assessment instruments has emerged as questions of temporal orientation and temporal adaptation continue to intrigue psychologists and those involved in health care. The Zimbardo Time Perspective Inventory (ZTPI) is one example of a scale that is widely used in examining time and health behaviors and is used by those involved in direct-service situations to examine temporal orientation (Boyd & Zimbardo, 2005). Other innovative approaches to the role of temporal orientation, including reminiscence, recall, splitting, and temporal constriction, in structuring behavior offer intriguing research possibilities into time, passages, and transitions. One area of inquiry that is potentially valuable revolves around the impact of various traumas on temporality.

Sequential thoughts and perhaps sequential actions are also axiomatic to time reckoning for through them we develop a kind of extended consciousness vital for elementary psychological and social psychological aspects of life. Temporal awareness is recognized as a developmental property vital for personality, self-concept, sense of well-being, and control. That is, there is a strong relationship between temporal complexity, maturation, life-course transitions, as well as the pace and density of activities. As early as age 2, some anticipatory mindset begins to become evident, and by age 6 or 7, higher order thinking, consonant with an adult-like sense of temporality, is involved in both cognition and behavior. Not surprising, time is thought to be fundamental to formal operations and to ordering principles involving extension or proleptic imagery. Similarly, intentionality, or forward temporal projections, serve to structure a sense of futurity.

Perception and cognition are inexorably tied to experience, including time, and are dependent, in turn, on information processing. From a psychological standpoint, changes in temporality thought to be associated with advanced age may be due to delayed processing times associated with stimulus masking, sequential stimulus integration, motivation, schemata for and amount of information already stored, peculiarities of memory function, interaction with others, or slowing of an internal clock. Sense of time is highly personal, and the results of time research among psychologists are anything but consistent; the concomitants of testing currently preclude definitive conclusions. It is fairly clear, however, that matters of tempo are anchored in the pace of experience and by our internal rhythms, and, in turn, affect the way time's transitions are perceived. As has been hypothesized by many, health status, among an array of related variables, plays a role in time's perception and in maintaining an integration of temporal perspectives.

Whether time estimation, a comparison of perceived versus clock time, is sufficient to account for widely documented performance differences with age is a difficult question. Further, whether accuracy in time estimation over the short run has any relationship to longer temporal perspective has not been demonstrated. As valuable as laboratory research is for certain aspects of time perception, the link with lived temporal experience awaits validation.

Temporality and Life Course

The way we think about time is unique to humans and provides the ground on which recurrent patterns in the environment are incorporated into a mental model of what life is all about. In addition to internal bodily processing and psychological functioning, time sense is ingrained in interaction and membership categories. In many respects, time is also socially structured, and that construction imposes itself on the ways in which individuals organize their temporality. Time is deeply rooted in cultural and social systems and, in many respects, membership groups provide coordination of the various times operative in people's lives and their patterns of participation are reflected in their awareness of and attitudes about time. As a corollary, anything that disturbs the relationship between group and individual members is likely to affect individual temporal orientations. Beginning with family life, education, and work, and moving on to involvement in diverse organizations, the mandates of public policy, and the mundane aspects of life such as meal functions and weekly activities, life is punctuated by social influences. These influences are thoroughly internalized, functioning as institutions writ-small in that they provide the rhythm, routines, and temporal predispositions that make up the flow of time. Age grading, age norms, and socially prescribed transitions provide an inexorable link between individual definitions of temporality, definitions of the life course, individual experience, and recognized societal transitions. There is dynamic but loose coupling between lives and social structures that makes temporal integration, or isochronalism, difficult to maintain but vitally important.

Social correlates constitute another facet of temporality and definition of the life course. By and large, these social facets maintain synchronization via the synthetic regularity of clock time, yet asynchrony may arise. Nonetheless, time is widely thought to be culturally contingent and socially emergent, evolving out of primary activities and the need to impose organizational schemata. Baars (2006) speaks of a triple temporality of aging, meaning that time is composed of chronological, personal, and narrative elements. By the latter, he is referring to the way a person's stories and accounts symbolize temporality, reifying its status. Although the pace of time may surface from a biological substrate, or be couched in the rhythm of life or the structure of the language, it is seldom written in stone. Time's variability comes from the role that contextual factors play in determining individual timelines. The gamut of variables incorporated under the social dimension is broad, ranging from general normative temporal orientations to the impact of immediate and mundane variables such as health status, health care regimes, interaction patterns, place of residence, and occupational pursuits. To the extent that individuals have differential involvements in social activities, work, and family life, they manifest distinct temporal horizons. Of course, gender and a host of socially established differences are an inescapable part of the equation and serve to nuance the relationship. In other words, sense of time, timing, and temporality—their construction and perception—reflect the many varieties and the relativistic nature of temporal worlds that coexist for individuals ensconced in a given social system.

Through the mechanism of shared time, the relational property of inner and outer time is established. One of the more palpable patterns imposed on individuals is conception of life course, age norms, and the number and breadth of temporal gradations held by a particular society, social group, or situation, yet there are countless other similar consensual perspectives on temporality. Childhood and old age, as they are now conceived, are consequences of a modern industrial temporal orientation. Historical awareness adds yet another facet to temporal reckoning. Locating our kind and ourselves in the long-term flow of events, whether through religion or mythology, provides an ideational dimension to time. Time viewed as a consequence of history also adds a feeling of linearity to its passage: the past receding away in one direction while the future rushes forward, like an arrow, seemingly of its own volition, from the other direction.

Time in Aging Research

In aging research, time is utilized to provide a basic index for behavior, serving as a framework subsuming a number of time-dependent processes; but, in and of itself, time has limited explanatory power. Time is often discussed as analogous to space, the metaphors of simultaneity, direction, and duration being used in both cases. Temporal orientation itself is likely a composite of four linked elements. These elements are biological, personal, social, and historical in nature, with each possessing its own ontological status. At any point, temporality reflects the interweaving of these elements as well as the transitory primacy of one of them. All too frequently there is an overemphasis on chronological time to the exclusion of other dimensions of temporality.

Research in aging and health care in general is consistent in contending that the body is not only the vehicle by which the world is experienced, but it is a primary mode by which the self is revealed (Black, 2006). Another common supposition is that older individuals are less future-oriented than younger people, but those who distinguish cognitive and subjective components of futurity have challenged this notion. What does seem clear is that persons who have a positive outlook, who perceive something affectively promising on the horizon, are more future-oriented. It may also be the case that future time perspective among the elderly is a reflection not of age per se but of personality structure and situational influences or declines of one or another type (Dittmann-Kohli, 2006; Lang & Carstensen, 2002). In a structural equation analysis of five national data sets in Israel, Shmotkin (1991) averred that although futurity declines and orientation to the past increases with age, neither stands free of a sense of life satisfaction. It may well be the case that a sense of autonomy, control, and futurity are interconnected. In contradiction, others assert that individuals with high future concerns are less personally secure than those focused in the present.

Another psychological characteristic thought to be associated with foreshortened time perspectives is awareness of finitude (Lang & Carstensen, 2002). Likely as not, any relationship—and the evidence is not yet complete—is between foreshortened subjective futures and awareness of death. It is important to bear in mind that the latter cannot be operationalized simply by chronological age. Current health status, sense of impairment, autonomy, and other comparable factors are involved. Further, retrospection and reminiscence, the converse of futurity, may increase with age but are not as obsessive or as simplistic a component of time orientation as has often been assumed.

Finally, one of the paradoxes of temporal reckoning is that the time of memory or of an anticipated future does not exist in isolation from the present or the concerns of the moment. Time is continuously experienced and interleaved; it can be partitioned only for purposes of analysis. Past, present, and future commingle in the here and now, although the focal length of time perspective may be long or short, depending on momentary preoccupations. The future is thus created, not necessarily of equal intervals, out of an actor's current agenda, the same as is the case for the past. Both are important components of motivation for those who positively anticipate the coming of tomorrow.

Jon Hendricks

See also

Life Events
Life Review

Internet Resources

International Society for the Study of Time
http://www.studyoftime.org/

International Society for the Study of Time Journal: KronoScope
http://www.kronoscope/

REFERENCES

Baars, J. (2006). Chronologicical time and chronological age: Problems of temporal diversity. In J. Baars & H. Vesser (Eds.), *Aging and time: Multidisciplinary perspectives* (pp.1–13). Amityville, NY: Baywood.

Black, H. K. (2006). *Soul pain: The meaning of suffering in later life*. Amityville, NY: Baywood.

Boyd, J. N., & Zimbardo, P. G. (2005). Time perspective, health, and risk taking. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time*. (pp. 85–107). Mahwah, NJ: Lawrence Erlbaum.

Dittmann-Kohli, F. (2006). Temporal references in the construction of self-identity: A life-span approach. In J. Baars & H. Vesser (Eds.), *Aging and time: Multidisciplinary perspectives* (pp. 83–120). Amityville, NY: Baywood.

Hendricks, J. (2001). It's about time. In S. McFadden & R. C. Atchley (Eds.), *Aging and the meaning of time* (pp. 21–50). New York: Springer Publishing Company.

Lang, F. R., & Carstensen, L. (2002). Time counts: Future time perspective, goals, and social relationships. *Psychology and Aging*, *17*, 125–139.

Modrell, R.W. (2002). Intentionality and the experience of time. *KronoScope 2*, *1*, 21–39.

Roeckelein, J. E. (2000). *The concept of time in psychology: A resource book and annotated bibliography*. Westport, CT: Greenwood Press.

Shmotkin, D. (1991). The role of time orientation in life satisfaction across the life span. *Journal of Gerontology: Psychological Sciences*, *46*, P243–P250.

Van Der Meer, E. (2006). Psychological time: Empirical evidence, theories, and age-related effects. In J. Baars & H. Vesser (Eds.), *Aging and time: Multidisciplinary perspectives* (pp. 43–82). Amityville, NY: Baywood.

TOTAL PARENTERAL NUTRITION

See
Feeding: Non-Oral

TRANSITIONAL CARE

Transitional care is defined as a set of actions designed to ensure coordination and continuity of health care for patients as they transfer between different locations or different levels of care within the same location. Representative locations include (but are not limited to) hospitals, subacute and postacute nursing facilities, the patient's home, primary and specialty care offices, and long-term-care facilities. Transitional care is based on a comprehensive plan of care and the availability of health care practitioners who are well trained in chronic care and know about the patient's goals, preferences, and clinical status. It includes logistical arrangements, education of patients and families, and coordination among the health professionals involved in the transition. Transitional Care encompasses both the sending and receiving aspects of the transfer and is essential for persons with complex care needs.

Increasing evidence suggests widespread problems associated with the quality of transitional care. Lack of incentives and accountability make these transfers particularly susceptible to medical errors, service replication, and unnecessary utilization. Qualitative studies have consistently shown that patients and their caregivers do not know what to expect and are unprepared for the next care setting. They do not understand how to manage their conditions, feel abandoned because they do not know which health care practitioner can provide guidance, and believe that their input into their care plan is often disregarded. Many patients and caregivers feel frustrated with redundant assessments and dissatisfied performing tasks that their health care practitioners failed to do. Quantitative evidence increasingly demonstrates that patient safety is jeopardized during transitional care, often requiring return to a higher intensity care setting.

Creative and promising solutions can address these serious quality problems. Forward-thinking funding agencies have identified transitional care as an area of health care research in need of serious attention. New models can identify care deficiencies, promote quality improvement initiatives, and improve the care experienced by older adults during transitions. Developments are being made at the patient–caregiver level, practice level, system level, and policy level.

The patient–caregiver level is the foundation of a transitional-care pyramid, and the patient is often the only common thread between sites of care. The Care Transitions Intervention uses a specialized nurse, a Transition Coach, who helps patients reconcile and manage their medications, maintains patient-centered health records, completes follow-up care with their primary physician, and learns how to recognize and respond to red flags that indicate their condition is worsening. Providing patients with support and tools to participate in their transitional care reduces hospital readmissions and associated costs. The benefits of this model were sustained as long as 6 months. More information on this model can be found at www.caretransitions.org.

At the practitioner level, multiple studies have shown that involving advanced practice nurses (APNs) during transitions can reduce hospital readmissions. In these models, APNs assume a primary role in managing patients and communicating with other professionals. Typically, these programs last for 2 to 4 weeks. Studies have also shown the benefit of pharmacy consultation during this vulnerable time. Increasingly, hospital-based physicians are becoming more actively involved in transitions out of hospitals.

At the level of the delivery system, care fragmentation remains a significant challenge. The 2001 Institute of Medicine report, *Crossing the Quality Chasm*, summarizes current practice: "Physician groups, hospitals and other health care organizations operate as silos, often providing care without the benefit of complete information about the patient's condition, medical history, services provided in other settings or medications prescribed by other clinicians (page 2)." An area ripe for research in systemic transitional care intervention is health information technology (HIT). In an ideal system, basic health information would seamlessly follow the patient between sites of care. Information would be updated across sites as test results become available or the health care needs of patients changed. Information would be secure yet transparent to everyone involved in caring for the patient, including practitioners, the patient, and caregivers. To achieve this vision, research needs to focus on making existing HIT systems interoperable and accessible from acute, postacute, and long-term-care settings. Such a system may require developing strategies to transfer information between more advanced users and less advanced users.

The work being done at the patient and practitioner and system levels strives to set a national agenda of increasing awareness and motivating policy makers to act on transitional-care issues. Current goals of the Joint Commission on the Accreditation to Healthcare Organizations include (1) encouraging medication reconciliation prior to transfer; (2) incorporating transitional care into tracer methodology to assess how prepared patients were to return home; (3) refining accreditation standards for discharge planning to include transitional-care elements; and (4) implementing a "speak up" campaign aimed at improving consumers' ability to assert themselves during hospital discharge. Further, experts acknowledge it is impossible to address and improve transitional-care quality issues without standardized, reliable means of measurement. Such measures encourage "Pay for Performance" approaches designed to minimize transition-related quality and safety problems. The Care Transitions Measure is a measure (see http:/w/ww.caretransitions.org) that effectively discriminates among providers and predicts recidivism.

Improving transitional care requires new models and tools. Current research, at patient and practitioner levels, suggests the potential for large-scale impact at the system and policy levels. The quality gaps between high- and low-quality care transitions will narrow as patient education evolves into patient activation, individual practitioners collaborate with colleagues across sites of care, independent information systems enable shared clinical information and thus greater integration between systems, and policies prescribe routinized safe and effective transfers.

Sandra Chalmers
Eric A. Coleman

See also
Assisted Living
Nursing Homes
Subacute Care

Internet Resources
Center for Medicare Advocacy
http://www.medicareadvocacy.org/Materials_MainPage.htm#EdMats

Division of Health Care Policy and Research, University of Colorado Health Sciences
http://www.caretransitions.org

The Joint Commission on the Accreditation to Healthcare Organizations
http://www.jointcommission.org/GeneralPublic/Speak+Up/

United Hospital Fund
http://www.uhfnyc.org/pubs-stories3220/pubs-stories_show.htm?doc_id=113388

REFERENCES

Coleman, E. A., & Berenson, R. A. (2004). Lost in transition: Challenges and opportunities for improving the quality of transitional care. *Annals of Internal Medicine*, *141*(7), 533–536.

Coleman, E. A., Smith, J. D., Frank, J. C., Min, S-J., Parry, C., & Kramer, A. M. (2004). Preparing patients and caregivers to participate in care delivered across settings: The care transitions intervention. *Journal of American Geriatrics Society*, *52*, 1817–1825.

HMO Care Management Workgroup (2004). One patient, many places: Managing healthcare transitions. Part II: Practitioner skills and patient and caregiver preparation. *Annals of Long-Term Care*, *12*(10), 34–39.

Kramer, A. M., Bennett, R., Fish, R., Wilkenson, L., & Coleman E. A. (2004). Final summary report of the status of electronic health records in post-acute and long-term care. *DHHS Assistant Secretary for Planning and Evaluation.* Contract No. 233-02-0070.

Naylor, M, D. (2002). Transitional care of older adults. *Annual Review of Nursing Research*, *20*, 127–147.

Report Brief. (2001). Crossing the Quality Chasm: A New Health System for the 21st Century. Washington DC: Institute of Medicine.

TRANSPORTATION

Personal mobility is a key determinant in maintaining one's independence, accessing goods and services, and the pursuit of social and economic opportunities. In many countries, the automobile has become the primary means of transportation. With the exception of those living in extreme poverty or dwelling in cities, there are few impediments to personal mobility until age-related changes prevent individuals from safely operating a vehicle (Schaie & Pietrucha, 2000). The U.S. Department of Transportation (2006) states that it is in the best interest of an individual to prolong automotive mobility as long as possible (i.e., as long as a person can safely drive). Public transportation is available in major cities but is often limited in outlying suburban and rural areas. A person may also be unable to use regular public transportation due to a functional or cognitive limitation. Special senior transportation is available to address the mobility needs of those older adults who can no longer drive or use public transportation.

History and Policies

Due to the rise of the automobile as the primary means of personal mobility, the United States is less connected by public transportation today than it was in the late 1920s (Wacker, Roberto, & Piper, 1998). This is true for other industrialized countries only to a much lesser extent. In 1964, Congress enacted the Formula Grant Program for Elderly and Persons with Disabilities, an amendment to the Urban Mass Transportation Act. This landmark piece of legislation was the first step toward addressing the transportation needs of older adults and persons with disabilities and led to a significant increase of special transportation services (Straight, 2003; Wacker, Roberto, & Piper, 1998). Nearly a decade later, the Rehabilitation Act of 1973 (Sec. 504) required transportation systems to modify their designs to address the needs of older individuals. This led to discount fares during off-peak hours and the creation of paratransit systems—special door-to-door transportation services for older adults (Wacker, Roberto, & Piper, 1998).

The Americans with Disabilities Act (ADA) of 1990 mandated wheelchair access to all new public transportation vehicles and paratransit systems, which are comparable to fixed-route systems in services and fares. The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 was the impetus for better coordination of local and regional transportation systems by including them as an essential factor in funding decisions. This act also permitted transfer of funds between highway and transit programs (Wacker, Roberto, & Piper, 1998).

More recently, transportation experts and gerontologists have expressed concerns about the increased reliance on the personal automobile coupled with the aging of the baby boomer generation. These demographic trends threaten to isolate, or at least severely restrict, the personal mobility of a large segment of the American population (Straight, 2003). As drivers age, changes in their health may compromise their ability to safely maneuver a vehicle. A person's vision, physical stamina, attention span, or reaction time may gradually deteriorate, challenging their ability to drive safely. Determining if and how to discontinue a person's driving privileges is a difficult task. Some states have attempted to address this issue by regulating the renewal of drivers' licenses. However, proposals to limit the driving privileges of older persons have been criticized as ageist, because they are unfairly implemented and do not account for years of experience or health-related accommodations (Straight, 2003).

Some agencies have developed programs to facilitate safe driving skills into late adulthood. A number of Veterans Administration organizations have begun to offer driving rehabilitation services. The goal of these programs is to instruct drivers on ways to manage their illness or disability in a manner that allows the participants to safely operate a motor vehicle. The programs often involve physical therapy and occupational therapy to strengthen and maintain a person's physical driving capabilities (U.S. Department of Veteran Affairs, 2003).

Transportation Programs and Funding

Nondriving older adults rely on a wide range of transportation providers, including public transit authorities, private for-profit and nonprofit organizations, religious groups, and informal support systems such as caregivers and friends. When driving oneself is no longer feasible, older individuals frequently turn to friends or family to get them where they need to go. Ridesharing with an acquaintance, however, may be inconvenient (for either passenger or driver) or viewed as threatening one's independence (Ritter, Straight & Evans, 2002).

Walking is another common way elderly people get from one place to another. This mode of transportation has a dual benefit in that pedestrians get to their destination while simultaneously engaging in a healthy activity. Roughly 5% of persons age 75 or older identify walking as their primary mode of transportation (French, 2003). Policy makers should recognize and address the needs of older pedestrians by funding the construction and maintenance of public walkways and working to lengthen the traffic lights at crosswalks.

A small but significant fraction of the older population uses public transportation. According to Straight (2003), current public funding levels fail to meet the specific transportation needs of elderly adults. Numerous changes in government funding priorities and the overall structure of transportation services need to be enacted to accommodate the projected increase in the number of older Americans in the next few decades. Most public transportation services are fixed-route systems. However, transit authorities can fulfill the equal-access mandate by operating deviated-fixed-route systems that operate on a fixed route from which the driver may deviate if an eligible rider makes a request.

Another common approach is paratransit or demand-responsive systems that are usually available only to an eligible subgroup of the population, such as older adults. The services are more flexible, bringing a passenger from one specific location to another. Some demand-responsive systems operate on short notice, whereas others require up to 24 hours advance notice. The systems also differ in the extent of services rendered. Some providers will only stop at the curb, whereas others will come to the door or even inside a home to pick up a passenger. Incidental transit is transportation provided by human-service organizations for their clients, such as van services that transport clients to and from an adult day care center.

A significant amount of capital equipment costs, operational expenses, and administrative costs of public and private nonprofit senior transportation providers are covered by the Federal Transit Administration (FTA). A second important source of funds is the U.S. Department of Health and Human Services (DHHS), which administers funding provided by the Older Americans Act (OAA), Title XIX of the Social Security Act (1965), and the Community Services Block Grant (Wacker, Roberto, & Piper, 1998). Many state and local agencies receive their transportation funding through these programs.

The costs to the user of senior transportation services vary, depending on the services used. For example, door-to-door transportation services may cost up to twice the regular fare, whereas off-peak travel using regular public transportation costs half the usual fare. If a client is going to a physician's visit and lacks individual transportation, Medicaid will often cover the costs of transportation to the selected provider. Human-service organizations may charge a nominal fee for the use of their transportation services.

Accessing Services

Procedures for assisting clients in accessing transportation services are as varied as the systems in place. Typically, the process begins with assessment of the client's individual needs. Does the client have specific physical or cognitive limitations that need to be addressed? What are the client's reasons for seeking senior transportation services? The practitioner should then educate the client about the available local transportation and senior transportation systems. Which service matches the client's individual transportation needs? Does the client fit the eligibility requirements? Typical eligibility requirements are age-related (e.g., 60 years and older) or certain levels of disability or chronic illness. The client may need assistance gathering the required documentation and completing an application. An eligibility letter from a physician might be required. It is helpful to rehearse with the client how to use the senior transportation system and provide a written list of steps: calling, setting up a pick-up time, using transportation passes, and so forth. This may be especially important for clients planning to use demand-responsive transportation because these systems require the client to make a request in advance. Finally, if it appears necessary, the practitioner should arrange for someone to accompany the client the first time that senior transportation is used.

Recommendations

A U.S. Department of Transportation (DOT) report on transportation for an aging society recommended construction of safer highway systems; improving signage; development of systems that aid in identifying and evaluating when driving becomes problematic or unsafe; performance-aiding technology like collision warning and avoidance systems; redesigning complex intersections; and the provision of nondriving senior transportation alternatives (U.S. DOT, 2006).

Matthias J. Naleppa
John G. Cagle

See also
Americans with Disabilities Act
Driving

Internet Resources

The U.S. Administration on Aging
http://www.aoa.gov/prof/transportation/transportation.asp

The U.S. Department of Transportation
http://www.nhtsa.dot.gov

REFERENCES

French, M. E. (2003). Walking and biking: Transportation and health for older people. *Generations*, *27*(2), 74–75.

Ritter, A., Straight, A., & Evans, E. (2002). Understanding senior transportation: A report and analysis of a survey of consumers age. Available at http://www.aarp.org

Schaie, K. W., & Pietrucha, M. (2000). *Mobility and transportation in the elderly*. New York: Springer Publishing Company.

Straight, A. K. (2003). Public policy and transportation for older people. *Generations*, *27*(2), 44–49.

U.S. Department of Transportation (2006). Older drivers. Available at http://safety.fhwa.dot.gov/older_driver/

U.S. Department of Veteran Affairs (February, 2003). Driver rehabilitation program report (RCS 10-0099). Available at http://www1.va.gov/vhapublications/

Wacker, R. R., Roberto, K. A., & Piper, L. E. (1998). Community resources for older adults: Programs and services in an era of change. Thousand Oaks, CA: Pine Forge Press.

TRAUMA

See
Injury and Trauma

TUBE FEEDING

See
Feeding: Non-Oral

TUBERCULOSIS

Tuberculosis (TB) is an ancient disease but one that, throughout history, has exacted a toll in terms of both morbidity and mortality. TB is a communicable, chronic bacterial disease caused by tubercle bacilli, most commonly *Mycobacterium tuberculosis*. In the United States in 1986, the number of reported TB cases per year showed an increase for the first time since record keeping began in 1953. This upward trend was visible until 1992, when an overall decline was seen to occur in the United States, a trend that has continued through 2004, when the most recent statistics available. However, the declines from 2002 to 2003, and from 2003 to 2004, were the smallest annual decreases in the past 10 years (Centers for Disease Control and Prevention, 2004b; 2005). Globally, the picture is somewhat different. In 1993 the World Health Organization declared TB a global emergency, and has focused various target goals that include halving the prevalence and death rates of TB, detecting 70% of new infectious TB cases, and curing 85% of those detected by 2005 (World Health Organization, 2004). Worldwide, about 8 million to 9 million new TB cases occur annually, about half of which are reported (Frieden, Sterling, Munsiff, Watt, & Dye, 2003; World Health Organization, 2004). Increases have occurred in sub-Saharan Africa and parts of Asia such as India, China, Indonesia, Bangladesh, and Pakistan, as well as countries of the former Soviet Union (Frieden, Sterling, Munsiff, Watt, & Dye, 2003; World Health Organization, 2004). The latter have a high proportion of multidrug-resistant TB (MDR-TB) (Schluger, 2002). There are a variety of factors associated with high rates of TB, the importance of which vary in developed versus undeveloped countries, including: high rates of HIV infection (since co-infection is relatively common);overcrowding; poor nutrition; the high cost of drugs used to treat TB; difficulties in maintaining adherence to TB treatment plans; erratic treatment; lack of access to knowledgeable practitioners and supplies; and inadequate funding for TB control programs, resulting in inadequate surveillance, contact tracing, and follow-up of patients.

Older adults have been said to constitute the biggest reservoir for TB in the United States (Stead, 1998). Early in the 20th century, TB prevalence was high, and most of today's elderly Americans had been infected by age 30 years. The majority of TB cases in older adults are therefore the result of endogenous reactivation of a previous latent infection, but some are due to acquisition of new infection (Zevallos & Justman, 2003). Some of the factors believed to increase the risk for developing TB in older adults include: the decline in immunity related to old age; inadequate nutrition; the presence of chronic illnesses such as diabetes mellitus, chronic renal failure, and malignancies; use of immunosuppressive medications such as corticosteroids; and emotional stress. The TB case rate among older persons in nursing homes is estimated to be at least twice as high as in comparable community-dwelling persons (Strausbaugh, Sukumar & Joseph, 2003; Zevallos & Justman, 2003). Reasons for this include that persons in nursing homes tend to be older and not in as good health as their counterparts who live at home, and nursing homes and long-term care facilities represent relatively closed environments with conditions that facilitate the spread of diseases such as TB. Persons aged 65 years or older have a disproportionately high share of TB-related mortality (Zevallos & Justman, 2003).

Epidemiology and Older Adults

In 2003, the overall TB case rate per 100,000 population for all ages and races regardless of sex was 5.1, which was a decrease from the previous year but exceeded the national goal of 3.5 per 100,000 for the year 2000. For all races regardless of sex, in those aged 65 years and older, the TB case rate was 8.4 per 100,000. Those aged 65 years and older account for about 13% of the population of the United States (Zevallos & Justman, 2003); in 2003, about 20% of all TB cases occurred in this group, thus proving disproportionately high (Centers for Disease Control and Prevention, 2004b; Zevallos & Justman, 2003). The median age of persons with TB has been decreasing since 1992 for many reasons, including HIV co-infection and immigration of persons born in countries where HIV is endemic. However, as the younger cohort of those who now have TB age, a second emergency may again be seen in the future when they are older (Davies, 1999).

Transmission and Infection

The major route of TB transmission is from person to person through inhalation of airborne droplet particles containing *M. tuberculosis*. Pulmonary TB is the most common type seen in the Unites States. Transmission through ingestion of contaminated food or drink or direct inoculation are rare in the United States. Many factors determine whether tuberculous infection is acquired by the exposed person, including: those relating to the host, such as genetic susceptibility; those relating to the organism, such as virulence; and those relating to the environment, such as the length of time and proximity of contact between the susceptible person and the person with active TB. Those who “share air,” for example in congregate living facilities such as nursing homes, particularly in an enclosed space, with a person who has active TB over a long period have a greater risk of acquisition. The sequence of events that occurs after *M. tuberculosis* enters the body is complicated, not completely understood, and dependent on adequate immune function to sequester the tubercle bacilli. If tuberculous infection occurs, it usually (90% of the time) does not progress to tuberculosis but remains dormant in a latent form. In the other 10% of cases, infection may progress to clinical disease within a year or 2 (5%), or this progression may occur years later (5%). Various factors influence whether infection is contained and controlled (Frieden, Sterling, Munsiff, Watt, & Dye, 2003; Luna, 2004).

It is important to understand the difference between latent TB infection (LTBI), and TB, the disease. Persons who have living tubercle bacilli present without clinically active disease are said to have latent TB infection. These individuals: (1) have tubercle bacilli in their body; (2) are usually infected for life; (3) usually have a positive reaction to the tuberculin skin test; (4) are not infectious to others; (5) usually have a negative chest radiograph; (6) do not usually have clinical symptoms of tuberculosis;

(7) usually have negative sputum smears and cultures for tubercle bacilli; (8) may be at risk for contracting tuberculosis, particularly if their immune system is compromised; and (9) may be candidates for preventive therapy. Persons who have active pulmonary tuberculosis: (1) are infected with *M. tuberculosis*, (2) usually have a positive reaction to the tuberculin skin test, (3) usually have clinical symptoms, (4) usually have positive sputum smears and/or cultures for tubercle bacilli before therapy has begun, and (5) may be infectious to others before treatment is effective (Centers for Disease Control and Prevention, 2004a).

Symptoms, Detection, Diagnosis, and Treatment

The major symptoms of pulmonary TB can be nonspecific, and the most common presentation is insidious, with the gradual development of vague symptoms, but presentation may be acute. Common signs and symptoms for active disease that are variable in severity and may or may not be present can include: cough, usually productive, that has lasted more than 2 weeks; fatigue or malaise; anorexia; weight loss; fever, either low grade or intermittent; sweating and/or chills at night; and chest tightness. In extrapulmonary TB, symptoms are related to the organ system affected (Schluger, 2002). The usual method for detecting latent TB infection is through targeted tuberculin skin testing using purifed protein derivative (PPD) although a newer ELISA-based blood assay has become available but not widely used (Zevallos & Justman, 2003). Guidelines for interpreting the test rely on what is known about the person's medical condition and risk (American Thoracic Society, 2000). Because the tuberculin skin test depends on delayed-type hypersensitivity, which may wane over time, false negative tests due to anergy (an inability to mount an immune response) may influence testing, so that a negative reaction does not rule out LTBI or TB disease. Anergy is more common in older adults, and a two-step tuberculin skin test may be used (Zevallos & Justman, 2003). Sputum smears and culture for acid-fast and tubercle bacilli are part of the diagnostic work-up for pulmonary TB and are important in monitoring the response to therapy in those with clinical disease. The chest radiograph is one of the important diagnostic tools, but older persons may often show atypical findings (Zevallos & Justman, 2003; Luna, 2004). If LBTI is identified in an HIV-negative person, then a course of therapy to prevent active TB disease is recommended, and various options are available. One option is for isoniazid (INH) therapy, and another is for rifampin and pyrazinamide for a shorter period of time (American Thoracic Society, 2000).

For those with drug-susceptible disease who are HIV-negative, there are 4 options of recommended initial treatment, most including isoniazid, rifampin, pyrazinamide, and ethambutol (Centers for Disease Control and Prevention, 2003). Detailed current treatment recommendations for pulmonary and extrapulmonary TB under various conditions such as co-infection with HIV, and liver disease as well as infection with resistant strains may be found in the reference by Centers for Disease Control and Prevention (2003). To assure adherence, directly observed therapy has found favor, and devices such as medication monitors have been used, but such devices can prove challenging to the elderly.

Clinical Manifestations in Older Adults

The diagnosis of TB in the older person is often delayed or missed. In the elderly, clinical symptoms of TB may be missed because they may also be explained by other medical problems that are common in the older person, the person may be relatively asymptomatic, or symptoms may be atypical or nonclassical (Strausbaugh, Sukumar, & Joseph, 2003). For example, Norman (2000) notes that fever may be absent or blunted in 20% to 30% of the time in the elderly. "Failure to thrive" in the elderly might actually result from unrecognized TB (Zevallos & Justman, 2003). Other illnesses mimicked by TB include pneumonia, malignancies, or congestive heart failure with pleural effusion. Sometimes it is difficult to elicit a clear history or problem description from elderly persons, especially if there are communication difficulties from medications or for other reasons. In extrapulmonary TB, where diagnosis may be difficult anyway, it can be even more problematic in the older person. For example, in meningeal TB, the headache, confusion, and dizziness can go unrecognized or be mistaken for other conditions or medication effects. Difficulty in recognition can result in continued transmission.

Treatment in Older Adults

Treatment in older adults should be as simple as possible while maintaining adequacy according to current recommended standards. Elderly persons may not receive adequate treatment for a variety of reasons, such as the problems in accessing health care due to limited finances, and mobility and functional problems that make travel and transportation difficult, especially if they live in rural areas. The treatment plan should consider the older person's vision, memory, and mental clarity as important in being able to adhere to the treatment. Directly observed therapy by a clinician or family member or other person may have to be arranged. In choosing medication, it is also important to think about the potential of adverse drug reactions, as well as interactions with other medications and with any other disease process. Side effects and adverse medication effects should be looked for carefully. Of particular concern is the potential for effects of drugs on the liver. The use of complicated devices for medication may actually have a negative effect on older persons who have a decline in physical function or in memory.

Felissa R. Lashley

REFERENCES

American Thoracic Society. (2000). Targeted tuberculin testing and treatment of latent tuberculosis infection. *American Journal of Respiratory and Critical Care Medicine*, *161*, S221–S247.

Centers for Disease Control and Prevention. (2005). Trends in tuberculosis—United States, 2004. *Morbidity and Mortality Weekly Report*, *54*, 245–249.

Centers for Disease Control and Prevention. (2004a). Questions and answers about tuberculosis. Atlanta: Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention. (2004b.). Tuberculosis in the United States. National surveillance system highlights from 2003. Atlanta: Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention. (2003). Treatment of tuberculosis. American Thoracic Society, CDC, and Infectious Diseases Society of America. *Morbidity and Mortality Weekly Report*, *52*(RR-11), 1–77.

Davies, P. D. (1999). The effects of poverty and ageing on the increase in tuberculosis. *Monaldi Archives of Chest Disease*, *54*, 168–171.

Frieden, T. R., Sterling, T. R., Munsiff, S. S., Watt, C. J., & Dye, C. (2003). Tuberculosis. *Lancet*, *362*, 887–899.

Luna, J. A. C. (2004). *A tuberculosis guide for specialist physicians*. Paris: International Union Against Tuberculosis and Lung Disease.

Schluger, N. W. (2002). Multidrug-resistant tuberculosis. In F. R. Lashley, & J. D. Durham (Eds.), *Emerging infectious diseases: Trends and issues* (pp. 203–213). New York: Springer Publishing Company.

Stead, W. W. (1998). Tuberculosis among elderly persons, as observed among nursing home residents. *International Journal of Tuberculosis and Lung Disease*, *2*(Suppl 1), S64–S70.

Strausbaugh, L. J., Sukumar, S. R., & Joseph, C. L. (2003). Infectious disease outbreaks in nursing homes: An unappreciated hazard for frail elderly persons. *Clinical Infectious Diseases*, *36*, 870–876.

World Health Organization. (2004). 8th annual report on global tuberculosis control. Geneva: World Health Organization.

World Health Organization. (2004, March). Tuberculosis. Fact Sheet No. 104. Geneva: World Health Organization.

Yoshikawa, T. T. (2002). Antimicrobial resistance and aging: Beginning of the end of the antibiotic era? *Journal of the American Geriatric Society*, *50*, S206–S209.

U

URINARY INCONTINENCE

Urinary incontinence is defined as involuntary loss of urine of sufficient severity to be a health and/or social problem. Although it is commonly hidden and not discussed with health professionals, urinary incontinence is a prevalent, morbid, and expensive condition. Among relatively healthy community-dwelling adults age 60 years and older, about one-third of women and nearly one-fifth of men have some degree of urinary incontinence. About 10% of both sexes have frequent (i.e., at least weekly) episodes and/or use protective padding. The prevalence is nearly 40% in hospitalized older adults and is as high as 70% to 80% in adults in long-term-care institutions. “Overactive bladder” is a syndrome that can overlap with urge incontinence; it includes urinary frequency (i.e., more than 8 voids per 24 hours), nocturia (i.e, awakening at night from sleep to void), and urgency (i.e, the precipitant need to void) with or without urge incontinence. The prevalence of overactive bladder is 16% to 17% in the adult population older than age 40; the prevalence is 31% in women age 75 and older, and 42% in men age 75 and older (Stothers, Thom, & Calhoun, 2005; Thom, Nygaard, & Calhoun, 2005).

Urinary incontinence can cause considerable physical and psychosocial morbidity and is costly. The condition is uncomfortable and predisposes to skin problems and falls in older patients with urinary urgency and gait instability. Untreated incontinence can lead to embarrassment, isolation, and depression and is commonly an important precipitating factor in the decision to enter a long-term-care facility. The annual health care costs of managing urinary incontinence and its complications are estimated to be more than $20 billion (Hu et al., 2004).

Pathogenesis

Continence requires effective lower urinary tract functioning; adequate mobility, dexterity, cognition, and motivation to be continent; and absence of environmental and iatrogenic barriers such as physical restraints and bedrails. From a lower urinary tract standpoint, incontinence results from (1) failure to store urine because of bladder overactivity and/or low urethral resistance, (2) failure to empty the bladder because of anatomic or physiologic obstruction and/or inadequate bladder contractility, or (3) a combination of these factors.

Several potentially reversible factors may cause or contribute to urinary incontinence, especially in geriatric patients (Kane, Ouslander, & Abrass, 2004). The common reversible factors can be remembered by the mnemonic DRIP (i.e., delirium; restricted mobility, retention; infection, inflammation, impaction of stool; polyuria, pharmaceuticals). New onset of urinary incontinence should prompt an assessment for these reversible factors, especially delirium, acute urinary tract infection (UTI), and urinary retention. Many of these factors can also contribute to more long-standing incontinence. Impaired mobility among older people, chronic constipation with stool impaction that obstructs the bladder outlet or irritates bladder innervation, atrophic vaginitis and urethritis in postmenopausal women, and conditions that cause polyuria (i.e., caffeine intake, poorly controlled diabetes, edema with mobilization of the fluid when supine) may cause or exacerbate incontinence. A variety of drugs can also contribute, including rapid-acting diuretics that overwhelm the bladder, drugs that interfere with bladder contractility (e.g., anticholinergics, narcotics), psychotropic drugs (especially antipsychotics) that interfere with mobility, alpha adrenergic drugs that affect the urethral sphincter, and cholinesterase inhibitors that can increase bladder contractility.

Persistent types of urinary incontinence are categorized in four basic types:

- *Stress* incontinence is far more common in women than men, among whom it occurs only after sphincter damage from surgery or radiation.
- *Urge* incontinence is the most common and bothersome symptomatic type of incontinence in the geriatric population and usually is associated with other symptoms of overactive bladder.
- *Overflow* incontinence, or incontinence that is associated with incomplete bladder emptying; symptoms are nonspecific and may mimic stress and urge types. Men, patients with diabetes mellitus, and patients with neurological disorders are at highest risk for overflow urinary incontinence.
- *Functional* incontinence involves involuntary urine loss, which is related predominantly to impaired mobility and/or cognition. These basic types of urinary incontinence commonly coexist. A substantial proportion of women have symptoms of urge *and* stress incontinence (generally referred to as a *mixed* type). Frail geriatric patients commonly have urge incontinence with bladder overactivity and functional impairments that contribute to continence problems.

Diagnosis

Basic evaluation of incontinent patients includes a focused history (which can be enhanced by a voiding diary), a targeted physical examination, urinalysis, and a post-void residual determination (Kane, Ouslander, & Abrass, 2004). Post-void residual determination is important in almost all patients because the symptoms of urinary retention are nonspecific, and the physical examination alone is not sensitive in detecting significant urinary retention (i.e., post-void residual 200 mL). A portable ultrasound device can provide noninvasively an accurate estimate of bladder volume. The objectives of this basic evaluation are to (1) identify potentially reversible factors; (2) determine, if possible, the most likely types and underlying causes; and (3) identify patients who may require further evaluation.

Selected patients may benefit from further urologic, gynecologic, and/or urodynamic evaluation. Patients with sterile hematuria should be considered for urine cytology and cystoscopy. Women with severe pelvic prolapse should be referred to a gynecologist for possible pessary placement or surgery. Women or men with severe stress incontinence should be considered for referral for surgical intervention. Patients with significant urinary retention, those with neurological disorders such as multiple sclerosis or spinal cord injury, and those who fail initial treatment interventions should be considered for urodynamic evaluation.

Treatment

The most common method of managing urinary incontinence is adult diapers and pads. Although many of these products are well designed and helpful, they are nonspecific and expensive. Many patients cannot afford these products and instead design their own unhygienic substitutes. Use of adult diapers and pads may serve simply to hide a curable or potentially serious problem or to foster dependency in frail geriatric patients. These products generally should be used as adjuncts to more specific interventions. Chronic indwelling catheters should be avoided, unless they are being used to prevent or manage skin wounds, treat chronic urinary retention, or for palliative care or patient preference.

Reversible factors identified by the basic evaluation should be treated. In some patients, urinary incontinence resolves after treating one or more of these factors (termed *transient incontinence*). A variety of behavioral therapies has been shown to be highly effective for targeted patients (Burgio et al., 2002). Functional, motivated patients with stress, urge, and mixed incontinence generally respond well to behavioral interventions. These interventions include education, self-monitoring with a voiding diary, modifications of fluid intake, various bladder-training techniques (e.g., timed voiding and strategies to manage urgency), and pelvic-muscle exercises. Many patients have difficulty isolating the appropriate pelvic muscles and benefit from adjunctive techniques, such as biofeedback (i.e., using surface electromyography of sphincter and abdominal muscles). For some mobility-impaired and/or cognitively impaired patients, reminders to void (or some other form of systematic toileting assistance) can effectively manage urinary daytime incontinence.

Pharmacologic treatment is effective and may be combined with behavioral intervention. For stress incontinence in women, adrenergic medications can enhance the contraction of the periurethral smooth muscle but are not approved by the U.S. Food and Drug Administration (FDA)for this indication. Pseudoephedrine may help some patients but must be used carefully in women with underlying cardiovascular disease. Duloxetine, a selective serotonin reuptake inhibitor that is approved in the United States for the treatment of depression, may also be effective for stress incontinence because it increases adrenergic tone to the urethra through a spinal cord mechanism. Topical estrogen may be useful in women with stress and urge incontinence and/or overactive bladder symptoms and signs of severe vaginal atrophy or atrophic vaginitis on pelvic exam.

Bladder-relaxant medications can be very effective in managing urge incontinence and other symptoms of overactive bladder, but they often are limited by their anticholinergic side effects (Hay-Smith, Herbison, Ellis, & Morris, 2005; Ouslander, 2004). Five drugs are approved for the management of urge incontinence and/or overactive bladder (i.e., darifenacin, oxybutynin, solifenacin, tolterodine, and trospium). Clinical trials suggest that these drugs are basically equally efficacious. They generally result in a 60% to 70% reduction in urge incontinence episodes and cause a 20% to 25% incidence of dry mouth, most of which is tolerable. The efficacy has been shown to be similar in older versus younger patients with several of these drugs. Short-acting oxybutynin has the highest incidence of side effects but is much less expensive and shorter acting than the other drugs; therefore, it may be useful in selected patients. Other side effects of concern in older patients include onset or exacerbation of constipation and gastroesophageal reflux, increased intraocular pressure in patients on therapy for glaucoma (this is not an absolute contraindication to their use, but consultation with the patient's ophthalmologist is advisable), and cognitive impairment, especially among patients with preexisting mild cognitive impairment or dementia. In the latter patients, careful questioning about any changes in cognition, mood, and behavior should be included in following the outcomes of therapy.

Alpha-adrenergic blockers have been shown to improve irritative voiding symptoms, including frequency and urgency, in men with prostatic enlargement (Alhasso, Glazener, Pickard, & N'Dow, 2005; AUA Practice Guidelines Committee, 2003). Tamsulosin and alfuzosin appear to have fewer effects on blood pressure and may be safer in older men, especially those with underlying cardiovascular disease who are on other hypotensive agents. Pharmacologic treatment of an underactive bladder associated with chronic urinary retention and overflow incontinence is not generally effective.

A variety of surgical procedures can be highly effective in women with stress incontinence, at least over a 1- to 5-year period. Women with intrinsic sphincter weakness (as opposed to urethral hypermobility) may benefit from periurethral injections of collagen. Surgery for urge incontinence, including augmentation cystoplasty and the implantation of sacral nerve stimulators, is generally reserved for patients with severe incontinence refractory to other therapies.

JOSEPH G. OUSLANDER

See also

Atrophic Vaginitis
Dysuria
Urinary Incontinence Assessment
Urinary Tract Infections

Internet Resources

American Urology Association
http://www.urologyhealth.org

International Continence Society
http://www.icsoffice.org

National Association for Continence
http://www.nafc.org

National Institute of Diabetes, Digestive, and Kidney Diseases
http://kidney.niddk.nih.gov/kudiseases/topics/incontinence.asp

Simon Foundation
http://simonfoundation.org

REFERENCES

Alhasso, A., Glazener, C., Pickard, R., & N'Dow, J. (2005). Adrenergic drugs for urinary incontinence in adults. *The Cochrane Database of Systematic Reviews*, 3, Art. No. CD001842. DOI: 10.1002/14651858.CD001842.pub2.

AUA Practice Guidelines Committee (2003). AUA guideline on management of benign prostatic hyperplasia. *Journal of Urology*, *170*, 530–547.

Burgio, K. L., Goode, P. S., Locher, J. L., Umlauf, M. G., Roth, D.L., Richter, H. E., et al. (2002). Behavioral training with and without biofeedback in the treatment of urge incontinence in older women. *Journal of the American Medical Association*, *288*, 2293–2299.

Hay-Smith, J., Herbison, P., Ellis, G., & Morris, A. (2005). Which anticholinergic drug for overactive bladder symptoms in adults? *Cochrane Database of Systematic Reviews*, 3.

Hu, T. W., Wagner, T. H., Bentkover, J. D., Leblanc, K., Zhou, S. Z., & Hunt, T. (2004). Costs of urinary incontinence and overactive bladder in the United States: A comparative study. *Urology*, 63, 461–465.

Kane, R. L., Ouslander, J. G., & Abrass, I. B. (Eds.) (2004). *Essentials of Clinical Geriatrics* (5th Ed). New York: McGraw Hill.

Ouslander, J. G. (2004). Management of overactive bladder. *New England Journal of Medicine*, *350*, 786–799.

Stothers, L., Thom, D., & Calhoun, E. A. (2005). Urologic diseases in America project: urinary incontinence in males: Demographics and economic burden. *Urology*, *173*, 1302–1308.

Thom, D. H., Nygaard, I. E., & Calhoun, E. A. (2005). Urologic diseases in America project: Urinary incontinence in women—national trends in hospitalizations, office visits, treatment and economic impact. *Urology*, *173*, 1295–1301.

URINARY INCONTINENCE ASSESSMENT

Urinary incontinence (UI) is common among older adults and often curable if appropriately identified, assessed, and treated (Kane, Ouslander, & Abrass, 2004). Of older women, 17% to 55% and 17% of older men experience UI (Stothers, Thom, & Calhoun, 2005). The physical, psychological, social, and economic impacts of UI are significant, and UI is associated with physical problems, such as urinary tract infections, pressure ulcers, rashes, and falls. These problems can be compounded by psychosocial consequences such as embarrassment, social isolation, depression, and diminished quality of life. Caregiver stress increases significantly when the care recipient becomes incontinent, and UI commonly precipitates many nursing-home admissions. The cost of incontinence care has been estimated at nearly $20 billion annually (Hu et al., 2004).

Identifying Urinary Incontinence

UI is frequently neglected: fewer than half of older adults with UI discuss it with their health care provider (Burgio, Ives, Locher, Arena, & Kuller, 1994; Prosser & Dobbs, 1997). They are embarrassed, erroneously believing that UI is part of the normal aging process or is not treatable. Additionally, health care providers typically do not ask patients if they are incontinent; thus, all direct-care providers should question their patients/clients and, if necessary, refer them to their primary care physician or nurse practitioner for UI assessment. Some simple questions to ask might be as follows:

- "Are you having any problems with your bladder?"
- "Do you have trouble holding your urine?"
- "Do you lose urine when you don't want to?"
- "Do you ever wear a pad or other protective device to collect your urine?"
- "Do you ever lose urine when you cough or laugh, or on the way to the bathroom?"

Assessment and treatment helps prevent patients from suffering the distress of UI.

An interdisciplinary approach is ideal because the factors that contribute to UI and its therapies may involve nursing, medicine, psychology, enterostomal therapy, physical and occupational therapies, and others.

Assessment

Assessment determines the optimal treatment and management of UI. Assessment is brief, simple, makes minimal demands on the patient, can be performed in an outpatient setting, and is reimbursed by Medicare. Typically, the patient completes an incontinence monitoring record prior to a UI assessment. If the patient is cognitively impaired, a caregiver should participate in the assessment and management plan.

Basic assessment of UI includes a history, physical examination, incontinence monitoring record, stress test, post-void residual volume, and urinalysis. This leads to a diagnosis of the specific type of UI, an indication that additional studies are needed, and implementation of appropriate therapy.

The goal of therapy is to attain maximal dryness and ameliorate symptoms to the patient's satisfaction. It is important to identify the symptom that is most bothersome to the patient and tailor treatment accordingly. For example, the patient's main concern may be infrequent nighttime wetness that interferes with sleep, whereas the clinician might feel that the patient's more severe daytime incontinence is the more glaring symptom to address. In this case, nocturnal incontinence is the patient's priority and should be the focus of initial treatment.

History

The history is an essential and accurate diagnostic tool for UI (Martin et al., 2006). The patient interview should provide a detailed characterization of the UI and a focused medical, psychological, neurological, and genitourinary history. This includes an assessment of medications, functional status, social issues, environmental factors, and other UI risk factors.

Eliminating risk factors of acute UI is essential to achieving and maintaining continence. The acronym DIAPPERS helps clinicians remember the reversible causes of acute UI: *D*elirium, *I*nfection of the urinary tract, *A*trophic vaginitis or urethritis, *P*harmaceuticals, *P*sychological causes, *E*xcess fluid, *R*estricted mobility, and *S*tool impaction.

Essential components of the clinical history are the patient's perception of the most bothersome symptom, his or her treatment preferences, motivation, and expectations for treatment outcomes. The patient should be asked about the duration and characteristics (e.g., stress, urge, dribbling) of UI and previous treatments and their effects. History taking must include frequency of UI, timing, amount of continent voids, and precipitants of incontinence (e.g., situational antecedents, cough, certain exercises, surgery, injury, previous pelvic radiation therapy, trauma, new onset of diseases, new medications). Asking the amount and the type of pad, brief, or other protective devices used can help quantify leakage. The patient should be assessed for other urinary tract symptoms (e.g., nocturia, dysuria, hesitancy, interrupted stream, straining, and hematuria) and for alteration in bowel habits or sexual function. The relationship between UI and intake of fluid, caffeine, alcohol, and medications that can affect continence status should be determined. Caffeine, alcohol, and diuretics cause polyuria, urgency, and frequency; sedative hypnotics (including alcohol) reduce awareness of the need to void and cause muscle relaxation. Anticholinergics cause sedation, rigidity, and immobility. Alpha- and beta-adrenergic agonists and calcium channel blockers decrease outlet resistance and stress incontinence. Narcotic analgesics can cause urinary retention, fecal impaction, sedation, and delirium.

Besides medical history, it is important to assess cognitive, functional, psychological, social, and environmental factors that can influence UI and its management. Determining the patient's ability to ambulate, undress, and position appropriately for voiding, and the ability to comprehend the signal to void or to trigger appropriate toileting behavior, is critical. Clothing should be evaluated and may require Velcro fasteners and elastic waistbands to facilitate speed and ease of undressing to void. Psychological factors, such as depression, can lead to apathy or lack of motivation to toilet. Social factors, such as living arrangement and the availability of caregiver assistance, must be assessed. Environmental assessment for factors that affect continence can be valuable. For example, is the path to the bathroom well lit? Is the bathroom well marked? Is the distance to the bathroom manageable for the patient? Can the bathroom accommodate assistive devices, contain grab bars, and have a raised toilet seat if needed? Are the bed and chairs 16 to 18 inches high to facilitate ease in rising to stand before walking to the bathroom?

Incontinence Monitoring Record

The incontinence monitoring record provides information to help determine the type and possible cause of UI and helps establish an appropriate management regimen. For 3 to 7 days, the patient or caregiver chronicles when voiding occurs, estimated volume (small or large), incontinence episodes (including leakage or dribbling), and associated events such as the presence of "urge," coughing, use of diuretic, requests for toileting assistance, bowel movements and whether accompanied by straining or fecal incontinence, and fluid intake. The record can indicate which behavioral interventions would be effective and provides a baseline to evaluate treatment efficacy. A Sample Bladder Record for ambulatory patients is available at http://kidney.niddk.nih.gov/kudiseases/pubs/diary/index.htm.

Physical Examination

Physical assessment includes general, abdominal, rectal, genital, and neurological examinations. The general exam focuses on conditions such as edema, neurological abnormalities, mobility, cognition, and manual dexterity related to toileting skills. Abdominal exams can identify bladder distention, organomegaly, suprapubic discomfort, masses, and signs of fluid collection or increased abdominal pressure. Rectal exams note perineal sensation, sphincter tone, fecal impaction, rectal mass, and prostate abnormalities. Genital exams identify skin abnormalities, atrophy, inflammation, masses, pelvic-organ prolapse, and pelvic-muscle tone. Neurological exams detect focal abnormalities that may indicate stroke, multiple sclerosis, or spinal-core compression.

Stress Test

The patient drinks 32 oz. of fluid 1 hour prior to the appointment. If this is difficult for the patient, the clinician can measure the post-void residual (PVR) volume first, then keeping the catheter in place, fill the bladder with saline before performing the stress test. With a full bladder, the patient is asked to cough vigorously while the examiner observes for any urine loss. If urine leaks immediately with the cough, then stress incontinence is likely; if leakage is delayed or persists after the cough, the patient probably has uninhibited bladder contractions. If this test is done with the patient lying on the exam table and there is no leakage, the test should be repeated in the standing position.

Post-Void Residual (PVR) Volume

PVR is the volume of urine remaining in the bladder immediately after voiding. The patient voids while being observed for hesitancy, straining, slow, or interrupted stream indicating obstruction, a contractility problem, or both. PVR is determined by subsequent catheterization or by pelvic ultrasound. Pelvic ultrasound is noninvasive and provides an estimate of bladder volume. PVRs less than 50 mL are considered normal bladder emptying. Repetitive PVRs of 200 mL or higher are signs of inadequate bladder emptying. Patients with abnormal PVRs may have treatable causes of UI and need more specialized evaluation.

Laboratory Tests

Urinalysis (UA) requires a clean-catch urine. UA can detect pyuria and bacteruria suggesting infection as a possible cause of UI. If infection is suspected, urine culture and sensitivity can specify bacteria and drug sensitivity. Hematuria without bacteruria suggests cancer, stone, or infection; glycosuria indicates uncontrolled diabetes; and proteinuria indicates renal disease. Patients with diminished renal function or polyuria should have blood tests, including blood urea nitrogen, creatinine, glucose, and calcium.

Specialized Tests

Referrals for specialized tests are recommended for patients who fail to respond to treatment, are considering surgical intervention, have hematuria without infection, co-morbid conditions such as recurrent urinary tract infection (UTI), persistent difficulty with bladder emptying, previous anti-incontinence or radical pelvic surgery, symptomatic genital prolapse, prostate abnormalities suggestive of cancer, abnormal PVR, and neurological conditions. Specialized tests include urodynamic evaluation to determine the anatomical and functional status of the bladder and urethra, cystoscopy to visualize the bladder and urethra, and imaging tests such as ultrasonic and fluoroscopic studies.

Accurate identification and assessment of incontinent older adults is critical to successful treatment. The assessment leads to a specific diagnosis and treatment plan, which can cure or improve the patient's UI.

LYNNE MORISHITA

See also
Atrophic Vaginitis
Fecal Incontinence
Sexual Health
Urinary Incontinence
Urinary Tract Infections

Internet Resources
American Urological Association
http://www.urologyhealth.org/

International Continence Society
http://www.icsoffice.org

National Association for Continence
http://www.nafc.org

National Kidney and Urologic Diseases Information Clearinghouse
http://kidney.niddk.nih.gov/kudiseases/pubs/bladdercontrol/

Simon Foundation
http://www.simonfoundation.org

Wound, Ostomy, and Continence Nurses Society
http://www.wocn.org/

REFERENCES

Burgio, K. L., Ives, D. G., Locher, J. L., Arena, V. C., & Kuller, L. H. (1994). Treatment seeking for urinary incontinence in older adults. *Journal of the American Geriatrics Society*, *42*(2), 208–212.

Hu, T. W., Wagner, T. H., Bentkover, J. D., Leblanc, K., Zhou, S. Z., & Hunt, T. (2004). Costs of urinary incontinence and overactive bladder in the United States: A comparative study. *Urology*, *3*, 461–465.

Kane, R. L., Ouslander, J. G., & Abrass, I. B. (2004). *Essentials of clinical geriatrics*. New York: McGraw–Hill, Inc.

Martin, J. L., Williams, K. S., Abrams, K. R., Turner, D. A., Sutton, A. J., Chapple, C., et al. (2006). Systematic review and evaluation of methods of assessing urinary incontinence. *Health Technology Assessment*, *10*(6), 1–132, iii–iv.

Prosser, S., & Dobbs, F. (1997). Case-finding incontinence in the over 75's. *British Journal of General Practice*, *47*, 498–500.

Stothers, L., Thom, D., & Calhoun, E. A. (2005). Urologic diseases in America project: Urinary incontinence in males: Demographics and economic burden. *Urology*, *173*, 1302–1308.

URINARY TRACT INFECTIONS

Bladder and kidney infections (urinary tract infections [UTIs]) are among the most common infections evaluated and treated in all age groups, whether in an outpatient clinic, long-term-care facility or hospital (Ackermann & Monroe, 1996;

Nicolle, 2002; Richards, 2004; Yoshikawa, Nicolle, & Norman, 1996). Acute UTIs can be divided into general anatomic categories: lower- or upper-tract infections. Lower-tract infections include urethritis (i.e., inflammation or infection of the urethra), cystitis (i.e., bladder infection), and prostatitis (i.e., acute or chronic inflammation or infection of the prostate gland in men). Upper-tract infection is referred to as pyelonephritis (i.e., kidney infection). UTIs are further classified as uncomplicated or complicated, depending on the underlying urinary tract structure and characteristics that may promote infection (Harrison, 1990).

Key Concepts

The urinary tract and urine are normally sterile. However, the urinary tract can become contaminated when bacteria ascend the urinary tract and colonize the bladder. In the elderly, bacteriuria is common and may be asymptomatic. The presence of bacteriuria alone does not imply that infection has occurred and this colonization does not usually require antibiotic treatment. As many as 50% of nursing-home residents and 20% of community-dwelling elders have bacteriuria (Nicolle, 2002; Yoshikawa et al., 1996).

The urinary tract is considered infected when the bacteriuria elicits an inflammatory response resulting in the presence of white blood cells in the urine. UTIs may need antibiotic treatment when they cause discomfort, pain, or other symptoms typically associated with urinary tract inflammation. In younger patients, these signs or symptoms are relatively easy to recognize. However, in the elderly, differentiating between common asymptomatic bacteriuria and symptomatic infection requiring treatment may be difficult (Richards, 2004).

Epidemiology of UTIs

Although the vast majority of UTIs are managed on an outpatient basis, UTIs account for 25% to 30% of all bacterial infections in institutionalized adults, affecting older women twice as often as older men (Richards, 2004). Nosocomial, or health care acquired, infections are frequently related to urinary catheters. Many are caused by bacterial organisms that are resistant to commonly used antibiotics and, consequently, are more difficult to treat (Nicolle, 2002). Many older adults with UTIs are at risk for poor outcomes including a decline in their functional abilities, hospitalization, bloodstream infections, and even death.

Most UTIs in both women and men are caused by enteric, gram negative bacilli from the colon (Nicolle, 2002). The most common gram negative organisms are *Escherichia coli, Proteus mirabilis, Klebsiella pneumoniae, Citrobacter* spp., *Serratia* spp., and *Enterobacter* spp. Of gram positive cocci, *Enterococcus* and *Staphylococcus* spp. are the most common causing UTIs (Richards, 2004).

Risk Factors

Many risk factors for UTIs result from physiological aging changes and the dysregulation of the immune system. As one ages, the ability of the immune system to respond to infection is diminished. Secondary conditions that suppress the immune response are malnutrition, diabetes mellitus, side effects of immunosuppressive medications, irradiation, and chemotherapy for cancer and other autoimmune diseases. In older men, a decrease in the bactericidal activity of prostatic fluid reduces the natural protective features against bacterial invasion and infection. Changes in the vaginal pH and normal vaginal flora and thinning of the vaginal wall in postmenopausal women due to hormonal changes are common and a significant risk factor for UTI. Obstruction of normal urine flow caused by kidney stones, structural abnormalities of the urinary tract, an enlarged prostate gland in men, or prolapsed bladder (cystocele) in women leads to urinary retention and stasis, increasing the risk for bacterial growth and infection of the bladder mucosa. Other risk factors for recurrent UTI are incontinence, presence of an indwelling catheter, history of antibiotic use, and decreased ability to care for one's basic needs such as hygiene, dressing, transferring, and toileting. Risk factors for the progression from persistent asymptomatic bacteriuria to asymptomatic UTI, and then to symptomatic UTI, is not well understood and deserves further study (Richards, 2004).

The presence of a chronic-indwelling catheter dramatically increases the risk for bacteriuria, inflammatory response to either the bacteria or the catheter itself, and symptomatic UTI. Indwelling urinary catheters develop a conditioning film of proteins, electrolytes, and other organic molecules from the urine. Bacteria attach to this film, divide, and secrete a polysaccharide matrix to form a sessile biofilm that adheres to catheter surfaces. Bacteria within the biofilm survive relatively protected from most antimicrobials and other host defenses. Under certain conditions, organisms can detach from the biofilm and infect the urinary tract or bloodstream (Trautner & Darouiche, 2004). Consequently, UTIs in chronically catheterized patients are associated with increased risk for bacteremia and death (Nicolle, 2001).

Clinical Diagnosis

Accurate clinical diagnosis of symptomatic UTI in the elderly is often difficult. Typical UTI symptoms are often referred to as irritative symptoms: pain or burning upon urination (i.e., dysuria); a sense of a sudden urge to urinate or difficulty postponing urination (i.e., urgency); an increase in the frequency of urination (i.e., frequency); passing only a small amount of urine; having blood in the urine; or having a dark, malodorous urine; and suprapubic tenderness. In the elderly, however, atypical and nonspecific symptoms such as altered mental status, new or worsening of urinary incontinence, dehydration, fever, and urinary retention may be present (Richards, 2004). Unfortunately, cognitively impaired persons often cannot describe the symptoms they are experiencing. Oftentimes, in the absence of another clear source of infection, practitioners falsely ascribe new symptoms or changes from baseline level of functioning to a UTI. This practice has led to overdiagnosing UTIs and, oftentimes, inappropriate prescribing of antibiotics.

Urinalysis and urine culture are often ordered during the initial evaluation of UTIs. Negative laboratory and microbiology findings are useful to exclude UTI. Urine collection for testing is usually done using the clean-catch technique; however, this may be challenging in older people. If an appropriate midstream urine specimen cannot be collected noninvasively, a sterile specimen should be obtained directly from the bladder with the temporary insertion of a urinary catheter.

Recurrent UTIs or treatment failures often require further diagnostic evaluation for predisposing risk factors or underlying conditions that can lead to relapse and reinfection. Usually, a second infection is a different strain or type of bacteria from the initial infection (National Institutes of Health, 2005). For some, a full genitourinary evaluation is warranted (Yoshikawa et al., 1996). In addition to anatomic or structural abnormalities in the host, adherence factors of the bacteria or the ability to excrete a protective film may result in recurrent UTIs (National Institutes of Health, 2005).

Treatment

Current management guidelines recommend antimicrobial treatment only for symptomatic UTIs in older patients. In the absence of culture results, clinicians must weigh the risks and benefits of empiric therapy. Initial empiric antibiotic choice should be adjusted based on urine culture results in order to effectively eradicate the offending organism and reduce development of antibiotic resistance. Current antimicrobial susceptibility and resistance patterns must be considered along with individual patient characteristics and preferences.

Length of antimicrobial treatment in the elderly often needs to be longer than that of younger persons. To eradicate the bacteria-causing organism effectively and prevent treatment failure and relapse, a 10- to 14-day course may be needed (Yoshikawa et al., 1996). In addition to antibiotic therapy, there are drugs to relieve the pain associated with UTI.

Most health advocates also recommend increasing fluid intake.

Prevention

Specific preventive interventions to reduce incidence of UTI are traditionally aimed at modifiable risk factors. Today, much attention is directed toward elimination of all unnecessary indwelling urinary catheters and optimizing urinary continence management. Research efforts are focused on improving diagnostic certainty, reducing inappropriate antibiotic prescribing, using alternative treatments (e.g., cranberry juice), advancing urinary catheter technology, reducing transmission of antimicrobial resistant pathogens, and vaginal mucosal protection (Richards, 2004).

DONNA LEWIS
CHESLEY L. RICHARDS
THEODORE JOHNSON

Internet Resources

American Medical Directors' Association
http://www.amda.com/caring/october2002/utis.htm

American Academy of Family Physicians
http://www.aafp.org/afp/20050801/451.html

National Institute of Diabetes and Digestive and Kidney Diseases (NIH)
http://kidney.niddk.nih.gov/kudiseases/pubs/utiadult/index.htm

Massachusetts General Hospital
http://www.massgeneral.org/library/wc.asp?tm=n&page=000036_3.htm

REFERENCES

Ackermann, R., & Monroe, P. (1996). Bacteremic urinary tract infection in older people. *Journal of the American Geriatrics Society*, *44*(8), 27–33.

Harrison, L. (Ed.) (1990). *Management of urinary tract infections*. London: Royal Society of Medicine Services.

National Institutes of Health (2005). Urinary Tract Infection in Adults. National Institute of Diabetes and Digestive and Kidney Diseases, U.S. Department of Health and Human Services. Available at http://kidney.niddk.nih.gov/kudiseases/pubs/utiadult

Nicolle, L. (2001). Topics in long-term care: The chronic indwelling catheter and urinary infection in long-term-care facility residents. *Infection Control and Hospital Epidemiology*, *22*(5), 316–321.

Nicolle, L. (2002). Resistant pathogens in urinary tract infections. *Journal of the American Geriatrics Society*, *50*, S230–S235.

Richards, C. (2004). Urinary tract infections in the frail elderly: Issues for diagnosis, treatment and prevention. *International Urology and Nephrology*, *36*, 457–463.

Trautner, B. W., & Darouiche, R. O. (2004). Catheter-associated infections: Pathogenesis affects prevention. *Archives of Internal Medicine*, *164*(8), 842–850.

Yoshikawa, T., Nicolle, L., & Norman, D. C. (1996). Management of complicated urinary tract infection in older patients. *Journal of the American Geriatrics Society*, *44*(10), 1235–1241.

UTERINE, CYSTOCELE/RECTOCELE, AND RECTAL PROLAPSE

See
Bowel Function
Fecal Incontinence
Urinary Incontinence Assessment
Urinary Incontinence

V

VALIDATION THERAPY

Validation therapy, developed through clinical practice with Alzheimer-type nursing-home residents, is based on a developmental theory that in old age, when controls loosen, disoriented, very old persons need to express buried emotions in order to die in peace. This final life struggle is called "Resolution." Validation techniques are based on the principle that when emotions are suppressed, they fester and can become toxic. When emotions are expressed to someone who listens with empathy, the person is relieved—and validated. Validation therapy uses 15 verbal and nonverbal techniques to communicate with those very old elders diagnosed with an Alzheimer-type dementia and includes a method for forming Validation Groups with time-confused elders. Validation therapy assumes an attitude of respect for old people diagnosed with a dementia.

Validation is an interdisciplinary helping method. The goal of Validation is to improve the quality of life. Nonverbal Validation techniques such as "music" and "mirroring" often restore dignity and well-being for early onset Alzheimer populations. Administrators, nurses, social workers, psychologists, and physical and occupational therapists report significant improvement after 6 months of Validation therapy with *late onset* Alzheimer's populations. Results include decreased staff burnout, increased communication between nursing staff and disoriented residents, decreased agitation, increased family visits, less movement to "Vegetation," fewer tranquilizing medications, and increased communication within Validation Groups (Blumenthal, 1999; de Klerk-Rubin, 1994; Feil, 2002; Fine & Rouse-Bane, 1995; Lewis & Feil, 1996; Neal & Briggs, 2000).

Verbal Validation Techniques

Verbal Validation techniques restore well-being to older people in Phase One of Resolution, "the Maloriented." These individuals are mostly oriented to time and place, have no history of mental illness, are verbal, but repeat things that are not true in present time and often accuse others, projecting their frustration. The Maloriented use present-day people to vent emotions that they never could express to important people in their lives in the past. In response, the Validating caregiver recognizes that the older person must use symbols (i.e., people or things in present time that substitute for people from the past) to express emotions. The Validating caregiver must accept the Maloriented where they are and let them heal by venting to someone who listens with empathy.

A caregiver full of hurt cannot listen with empathy. Step 1 in Validation means that the caregivers free themselves from their own emotions so as to enable them to accept the emotions of the older person and feel what they feel. The caregiver must step into the older person's shoes by "Centering." Verbal validation techniques for the Maloriented include the following:

1. Breathe deeply, inhaling from the nose and exhaling from the "Center" (a spot about 3 inches below the waist).
2. Avoid "feeling" words. Ask nonthreatening factual questions: Who? What? Where? When? How? Avoid asking "Why."
3. Rephrase, repeating their key word, picking up their tempo.
4. Reflect the look in their eyes.
5. Listen to their verbs. Use their preferred stense. Speak their language.

6. Ask the extreme: "How bad?" "How often?"
7. Reminisce.
8. Help the person find a familiar coping method.

The following is an example of an interaction using verbal Validation techniques:

> The nurse examines a 90-year-old who is physically not hurting but always complaining: "My back hurts. I have a pain in my chest. My neck hurts. I wish I were dead."
>
> The Validating nurse builds trust, and helps this old woman express her psychological pain. The woman is terrified of dying alone. Using the *kinesthetic* sense, the nurse asks, "Does it *feel* like a hammer pounding on your head, or is it more like a dull ache?"
>
> The woman responds (loosening her grip on the nurse's arm, relieved to be understood), "Yes. Just like a hammer. That's right."
>
> The nurse (asking the *extreme*), "When is the pain the worst?"
>
> The woman responds, "It hurts all the time, but at night, when I'm alone, the pain is horrible."
>
> *Rephrasing and reminiscing*, the nurse asks, "When no one is with you, does the pain get worse? Have you ever had this terrible pain before?"
>
> As the 90-year-old woman begins to trust, her voice becomes less harsh and shrill, demonstrating that she feels safe. "When my husband died, I had the same pain in my head."
>
> The nurse then attempts to *find a familiar coping method*: "How did you stand it when he died? What did you do?"
>
> The woman responds, "I listened to the Strauss waltzes we danced to. We loved to dance. That's how I got through the night."
>
> The nurse provides an answer, "I can get you some Strauss waltzes. When the pain gets bad, turn on your tape recorder. If you need me, I'll be here."
>
> The woman responds, relieved, "You're a sweet girl. You can go now, honey. I know you have other people to take care of. But you'll come back with the waltzes?"

The nurse keeps her promise and the older woman complains less. She is not cured, but she trusts the nurse and is no longer so afraid to be alone. This Validating communication took 5 minutes. Validation does not take much clock-time, but it does take energy, focus, and caring.

Nonverbal Validation Techniques

Those in Phase 2 of Resolution, "the Time Confused," are very old people with more physical deterioration. They can no longer tell chronological clock-time. They go by memories, not minutes. Their emotions spill. They lose social controls. They retreat to the past, partly because they are no longer able to tell present time and partly because they need to restore the past to resolve it before they die. The Validating caregiver accepts the physical deterioration and psychological needs, using both verbal and nonverbal Validation.

Actions involved in nonverbal validation include the following:

1. Observe the emotion.
2. Say their emotion with the same emotion.
3. Genuinely mirror their movements.
4. Use close, genuine eye contact.
5. Touch the patient using soft movements; for example, the "Mother's touch" is a gentle, circular motion on the upper cheek.

The following conversation is an example of an interaction using nonverbal validation techniques:

> An 88-year-old woman screams, "Get out of my way. I have to see Mother."
>
> The physical therapist, mirroring the woman's anxiety and moving with her responds, "Has something happened to your mother?"
>
> The older woman responds, "Yes. She is sick. She's all alone. I have to help her."
>
> The physical therapist, while gently touching the old woman on the upper cheek, using close eye contact, mirroring her fear, responds, "Are you afraid that you'll lose her?"
>
> The older woman, in response, stops moving, looks close into the physical therapist's eyes, nods her head and cries, "I lost her. She died."

On a deep level of awareness, the old woman knew that her mother was dead. She had buried that knowledge. Now, in old-old age, she restores her mother to express her grief. The physical therapist shares her grief. Crying brings relief. Within 4 minutes, the time-confused woman smiles at the physical therapist, "You're a nice girl. I like you." Each time the time-confused woman needs to see her mother, she is validated. After 3 weeks, she no longer looks for her mother. Her feelings have been expressed and she is relieved.

In Phase 3, "Repetitive Motion," older Alzheimer's patients may have lost speech but still retain the human needs to express emotions and feel safe and useful. They use movements of lips, tongue, teeth, jaw, and body to express needs despite the inability to communicate those needs in a way that is understandable to caregivers. Nonverbal techniques that can assist in the Validation process with older adults in Phase 3 include music and ambiguity. Music, especially childhood songs with emotional memories, can help those in Repetitive Motion to express emotions. Ambiguous responses including vague pronouns and numbers can provide safe options for patient–caregiver interactions.

The following is an example of an interaction using nonverbal Validation techniques with an individual in Phase 3:

> A 94-year-old says, "He titled on the beetlebum."
>
> The caregiver responds using *ambiguity*, "Did it hurt him?" (*him* is an ambiguous pronoun).
>
> The 94-year-old responds laughingly, "No. We twiddled all the time."
>
> The older adult and the caregiver laugh together, singing, "A Bicycle Built for Two."
>
> The 94-year-old communicates until she dies.

Using vague pronouns to substitute for unique word combinations in Phase 3 stimulates interaction and prevents withdrawal inward. As a result, the individual's emotions and human needs are met resulting in a death with dignity.

NAOMI FEIL

See also

Behavioral Symptoms in Patients With Dementia

Dementia: Overview

Internet Resources

The Cochrane Library

http://www.update-software.com/abstracts/AB001394.htm

Validation Training Institute

http://www.vfvalidation.org

REFERENCES

Blumenthal, H. (1999). A view of the aging disease relationship from age 85. *Journals of Gerontology, 54A*(6), B255–B259.

De Klerk-Rubin, V. (1994). How validation is misunderstood. *Journal of Dementia Care*, *2*(2), 14–16.

Feil, N. (2002). *The validation breakthrough: Simple techniques for communicating with people with Alzheimer's-type dementia* (2nd Ed.). Baltimore: Health Professions Press.

Fine, J., & Rouse-Bane, S. (1995). Using validation techniques to improve communication with cognitively impaired older adults. *Journal of Gerontological Nursing*, *21*, 39–45.

Lewis, C., & Feil, N. (1996). Validation: Techniques for communicating with confused old-old persons and improving their quality of life. *Geriatric Rehabilitation*, *11*, 34–42.

Neal, M., & Briggs, M. (2000).Validation therapy for dementia. Cochrane Database Syst Rev, 2, CD001394.

VASCULAR AND LEWY BODY DEMENTIAS

Although Alzheimer's disease (AD) has received considerable attention from the public and clinical scientists, epidemiological studies confirm the importance of vascular dementia (VaD) as a common cause of dementia in the elderly, representing 15% to 20% of all cases. In Europe and North America, AD predominates over VaD in a 2:1 ratio; in contrast, VaD accounts for almost 50% of all dementias in Japan and China. Despite improved survival rates associated with cardiovascular disease, an increase in VaD is expected. Lewy body disease (DLB) is thought to account for approximately one-third of all dementias, making it more common than VaD.

AD is characterized by smooth cognitive decline with symptoms of depression and psychosis occurring in a minority of affected individuals. Persons with VaD exhibit stair step decline often with symptoms of depression (Roman, 2004) whereas those with DLB have marked day-to-day variations in alertness and often experience hallucinations (Cummings, 2004).

Diagnostic Procedures

Magnetic resonance imaging (MRI) may be indicated when VaD is suspected. However, the white-matter changes are not necessarily indicative of dementia. The use of MRI to confirm the clinical diagnosis also has therapeutic and prognostic significance for patient and family.

Differential Diagnosis

Dementia associated with Lewy bodies overlaps with both Parkinson's disease (PD) and AD in presentation and distribution of pathology.

Pathological features of DLB include Lewy bodies (LB)—round neocortical inclusion bodies in the substantia nigra with abundance in the limbic cortex and limited LB formation in neocortex with neurofibrillary tangles being scarce. Lewy bodies are also seen in PD without dementia. The dopamine depletion of PD is due to neuronal death in the nigrostriatum. Both dopaminergic and cholinergic deficits are seen in DLB and may exceed those found in AD.

Patients whose disease begins with cognitive impairment will be diagnosed most often with DLB. In contrast, when the illness first presents with a syndrome-meeting criteria for PD followed by impaired cognition, the more appropriate diagnosis is dementia of PD.

The secondary neuronal degeneration of the VaD (i.e., multi-infarct, Binswanger's) is due to angiopathic disorders, most commonly ischemic heart disease, arrhythmias, hypertension, and diabetes (Roman, 2005). The pathology of VaD is frequently mixed (i.e., cortical and subcortical) with diverse presentations in which the loss of brain volume, ventricular dilatation, bradykinesia, and the cognitive deficits are difficult to distinguish from AD.

Key elements of the dementias are onset and decline, evidence of ischemic brain injury, prominent hallucinations, and Parkinsonian features. The dementia is likely to be vascular when the onset is abrupt, the course fluctuates, and there is significant evidence of ischemic brain injury. Hemiparesis, gait disorder, and other signs of past stroke also suggest VaD.

Symptoms of DLB include prominent visual or auditory hallucinations, signs of PD, and the course is characterized by lucid moments alternating with confusion. Paranoid delusions, falls, and depression may also characterize DLB. REM sleep behavior disorder is a striking phenomenon wherein patients seem to act out dream content, and injuries to the dreamer or a bed partner are not uncommon (Ferini-Strambi & Zucconi, 2000). It has a nearly unique relationship to disorders with accumulation of α-sinuclein (i.e., PD, DLB, and the multisystem atrophies) that warranted its addition as a supportive feature to the clinical description of DLB.

The cognitive impairment associated with stroke or acute traumatic brain injury is abrupt, and may predispose the person to dementia but may also improve during the 6 months following the incident.

General Treatment Considerations

The primary goal is to prevent the onset and progression of cardiovascular disease and diabetes. Weight control, exercise, lowering of cholesterol, treating diabetes and hypertension, eliminating tobacco use, and minimizing alcohol intake represent good preventive health behaviors at any age. Patients with suspected VaD should be treated for cardiovascular disease and take aspirin daily, unless contraindicated.

Medications to Palliate Cognitive Impairment

Cholinesterase inhibitors improve cholinergic neurotransmission and are FDA-approved for mild to moderate AD. However, because common dementias may overlap diagnostically, some practitioners offer every patient a cholinesterase inhibitor but will discontinue it if the response is equivocal at 3 months. These drugs may improve cognition, delay decline, lessen declines in activities of daily living, improve psychological and behavioral disturbances including psychosis, and forestall nursing-home admission. Transient side effects of cholinergic enhancement at the initiation of treatment are nausea, diarrhea, sweating, bradycardia, and insomnia. The effect of rivastigmine is best documented in Lewy body dementia (LB). Galantamine and donepezil may improve cognition in VaD. Galantamine may improve behavioral psychological symptoms of dementia (Olsen, Poulsen, & Lublin, 2005). It is not clear whether persons not responding to one cholinesterase inhibitor will respond to others; however, those who are intolerant of one agent deserve a trial of the other.

Memantine (Namenda) has been prescribed for dementing disorders in Europe for more than 10 years. Memantine acts as a noncompetitive antagonist of NMDA receptors and therefore compensates for this overactivation. It is a neuroprotective agent in both neurodegenerative and vascular processes because it ameliorates both cognitive and memory deficits. Currently, it is approved in the United States for treatment of moderate to severe AD. Randomized placebo-controlled trials in vascular dementia show small beneficial effects on cognition and agitation (McShane, Areosa Sastre, & Minakaran, 2006).

Many practitioners add vitamin E (i.e., alphatocopherol) to the regimen, but there is no evidence of cognitive performance enhancement. Adding extract of Ginkgo biloba, Kava, or other herbal remedies should be discouraged due to potential risk of interactions.

Management of Behavioral and Psychological Signs and Symptoms

The number and effectiveness of medications to reverse cognitive impairment remains limited, but a variety of pharmacological and nonpharmacological approaches may counter behavioral disturbances. Problem behaviors are often an expression of the caregiving context, the caregiver's capacities, as well as the patient's disease. The fluctuating course of both DLB and VaD make the certainty of benefits and ease of adjustments difficult. Teri et al.'s (1992) characterization of the three-point sequence of problematic behavior is the central management strategy:

- Identify the triggering events, such as changes in daily routine or the environment, interpersonal conflict, and emotional or physical stressors. Antecedents can then be removed or minimized as a preventive measure.
- Describe the "behavior" in detail, including frequency and circumstances. This observation period also refines recognition of antecedents and how the problem behavior fits into other aspects of the patient's life.
- Identify the "consequences" of the behavior, how the caregiver or others react to reinforce or deter the activity, and what happens when the activity ceases.

Delusions, Hallucinations, Unwarranted Suspiciousness, Falls

It is important to distinguish persistent false beliefs or perceptions from transitory illusions that result from impairments in vision, hearing, and cortical deficits. If the psychosis does not interfere with care or distress the patient, medication may be unnecessary. However, when patients act on their delusions through seclusiveness, threats, accusations, or assault, antipsychotic medication is necessary.

Gait disturbance due to apraxia, quadriceps weakness, rigidity, sedatives, and poor vision predispose the dementia patient to falls, soft-tissue injury, and fractures. Physical therapy and change in medications may reduce although not eliminate the risk for falls. This dilemma should be discussed with staff and family to reach a balance between safety and freedom.

Medications to Lessen Behavioral and Psychological Disturbances

Short-acting benzodiazepines can help the patient through procedures such as CT scan or MRI but impair alertness and cognition and should be avoided otherwise. Available evidence of short-term trials conducted in nursing-home patients suggests that some atypical antipsychotics may be beneficial for some noncognitive symptoms accompanying dementia. On April 12, 2005, the U.S. Food and Drug Administration (FDA) issued a public health advisory about a newly identified concern associated with the off-label use of atypical antipsychotic medications for the treatment of dementia-related behavioral disorders in the elderly. This advisory, based on an FDA analysis of data from 17 placebo-controlled trials of aripiprazole, olanzapine, quetiapine, and risperidone in elderly patients with dementia-related behavioral disorders, found a 1.6- to 1.7-fold increase in mortality rate when antipsychotic-treated patients were compared to placebo-treated patients during trials. The decision to use any medication in this fragile population must be individualized. In the face of even more limited data for alternative pharmacotherapy, use of atypical antipsychotic medications for treatment of psychiatric symptoms in dementia should be approached cautiously on the basis of the FDA advisory. In the informed-consent process, it is prudent to discuss increased mortality among patients with dementia, in addition to the other potential adverse effects, such as cerebrovascular events or metabolic syndrome (Liperoti et al., 2005; Wang et al., 2005).

Haloperidol, thioridazine, and risperidone, available in liquid forms, assist patients with difficulty swallowing or disguise medication for patients with difficulty accepting pills. Haloperidol has relatively low sedative and hypotensive effects. Preferable for longer term treatment, although more expensive, risperidone is a mildly sedative atypical antipsychotic and is not hypotensive. At low doses, it is superior to placebo for treating suspicious and aggressive behaviors, although in higher doses extra-pyramidal signs begin to appear. Olanzapine is less likely to induce extra-pyramidal effects than risperidone. It may cause somnolence and gait disorder but is rarely hypotensive. Quetiapine is more sedative than olanzapine but unlikely to cause extra-pyramidal effects. It is also relatively free of interactions with other drugs and reduces behavioral disturbances, especially hostility.

Although antipsychotics have been the main treatment for aggression, the antiepileptic valproate is increasingly recognized as an antiaggression agent as well as a mood stabilizer. It is relatively safe and is neither amnestic, arrhythmogenic, nor hypotensive but should be monitored with therapeutic levels. Gabapentin and lamotragine are newer antiepileptic agents with reports of antimanic properties; however, their use in older patients with dementia is not well documented.

YULIYA DEMENTYEVA
GARY J. KENNEDY

See also

Alzheimer's Disease
Dementia: Overview
Mild Cognitive Impairment: Controversy in Nomenclature and Treatment

Internet Resources

Alzheimer's Association
http://www.alz.org

Alzheimer's Research Forum
http://www.alzforum.org

Lewy Body Dementia Association
http://www.lewybodydementia.org/

National Institute of Neurological Disorders and Stroke http://www.ninds.nih.gov/disorders/dementiawithlewybodies/dementiawithlewybodies.htm

REFERENCES

Cummings, J. (2004). Reconsidering diagnostic criteria for dementia with Lewy bodies. Highlights from the Third International Workshop on Dementia with Lewy Bodies and Parkinson's Disease Dementia, September 2003. *Reviews in Neurological Diseases*, *1*(1), 1–4.

Ferini-Strambi, L., & Zucconi, M. (2000). REM sleep behavior disorder. *Clinical Neurophysiology*, *111* (Suppl. 2), S136–S140.

Liperoti, R., Gambassi, G., Lapane, K. L., Chiang, C., Pedone, C., Mor, V., et al. (2005). Conventional and atypical antipsychotics and the risk of hospitalization for ventricular arrhythmias or cardiac arrest. *Archives of Internal Medicine*, *165*(6), 696–701.

McShane, R., Areosa Sastre, A., & Minakaran, N. (2006). Memantine for dementia. Cochrane Database System Review (2), D003154.

Olsen, C. E., Poulsen, H. D., & Lublin, H. K. (2005). Drug therapy of dementia in elderly patients. *Nordic Journal of Psychiatry*, *59*(2), 71–77.

Roman, G. C. (2004). Facts, myths, and controversies in vascular dementia. *Journal of the Neurological Sciences*, *226*(1–2), 49–52.

Roman, G. C. (2005). Vascular dementia prevention: A risk factor analysis. *Cerebrovascular Diseases*, *20* (Suppl. 2), 91–100. Epub 2005 Dec. 2.

Teri, L., Truax, P., Logsdon, R., Uomoto, J., Zarit, S., & Vitaliano, P. P. (1992). Assessment of behavioral problems in dementia: The revised memory and behavioral problems checklist. *Psychology and Aging*, *7*, 622–631.

Wang, P. S., Schneeweiss, S., Avorn, J., Fischer, M. A., Mogun, H., Solomon, D. H., et al. (2005). Risk of death in elderly users of conventional vs. atypical antipsychotic medications. *New England Journal of Medicine*, *353*(22), 2335–2341.

VETERANS AND VETERAN HEALTH

The mission of the U.S. Department of Veterans Affairs (VA) is to serve America's veterans (individuals who have been honorably discharged from U.S. military service) and their families. The VA's responsibilities include: health care, which is coordinated by the Veterans Health Administration (VHA); socioeconomic support and assistance, coordinated by the Veterans Benefits Administration; and burial services, coordinated by the National Cemetery Administration. The VA is the second largest department in the U.S. government, with over 235,000 employees and an annual budget of over $63 billion (U.S. Department of Veterans Affairs, 2004).

VHA is the largest integrated health care system in the United States, with an annual medical care budget of over $28 billion. In 2003, VHA provided care to 4.8 million unique patients, including 49.8 million outpatient visits. It provides a comprehensive continuum of medical care through its163 medical centers, 137 nursing homes, and 43 residential rehabilitation treatment programs, as well as more than 75 home-care programs, 800 outpatient clinics, and 200 readjustment counseling centers. VA facilities are located in every state, Washington, DC, the Commonwealth of Puerto Rico, the American Virgin Islands, and Guam. VHA purchases some health care for veterans in other government or private facilities, and in certain circumstances also finances care for dependents and survivors of veterans. In addition to providing health care, VHA's mission also includes providing training for health care professionals, conducting medical research, serving as backup to the U.S. Department of Defense medical services, and during national emergencies, supporting the National Disaster Medical System.

In 2003, the estimated total veteran population was more than 25 million. Vietnam veterans (8.2 million veterans, representing 33% of total veterans) are now the single largest period-of-service component of the veteran population, followed by World War II veterans (4.4 million, 17% of the total), Korean conflict participants (3.6 million, 14%), and Gulf War veterans (3.8 million, 15%). Approximately 6.4 million veterans (25%) served only during peacetime. The number of World War I veterans is now too small to estimate. The veteran population is projected to decline to 15.0 million by 2030 (U.S. Department of Veterans Affairs, 2002), under currently expected armed forces strength.

The population of veterans aged 65 or older peaked at 10.0 million in 2000. It will decline to 8.9 million in 2010, but rise again to about 9.2 million in 2013 as the Vietnam era cohort ages. The number of veterans aged 85 or older is expected to nearly double, from 764,000 to a peak of 1.4 million between 2003 and 2012. Although a small proportion of the total veteran population, the number of veterans aged 100 years or more is also increasing. An over eight-fold increase is expected, from 1,400 veterans in 2003 (0.01% of the total veteran population) to a peak of almost 12,000 in 2024 (0.07% of the total).

The VA has faced the challenge of a rapidly aging veteran population since the 1970s (Cooley, Goodwin-Beck, & Salerno, 1998). Although the overall size of the veteran population is declining, the proportion of older veterans has increased dramatically. To meet this challenge, the VA has developed a broad continuum of geriatrics and extended care health care services. In addition, it supports a diverse portfolio of aging-related research and provides aging-related education and training for staff and students from a wide range of medical and associated health disciplines. In the new millenium, the VA's efforts to meet the needs of older veterans remain a high priority.

In 2003, the median age of veterans was nearly 59 years, compared with only 36 years for the general population (U.S. Census Bureau, 2004). Over 38% of the veteran population (9.6 million of the total 25.2 million veterans) was aged 65 or older, compared to 12% of the total U.S. population. By 2030, 45% of all veterans (an estimated 6.8 million of the projected total 15.0 million veterans) will be aged 65 years or older. Currently, 7% (1.7 million) of all veterans are female, including 3.5% (337,000) of veterans aged 65 or older. By 2030, female veterans will account for 14.6% (2.2 million) of all veterans and 6.9% (671,000) of veterans aged 65 or older. As in the general U.S. population, those aged 85 or older (the "old-old") are the fastest-growing segment of the veteran population, representing 3.0% of current veterans (764,000 of the total 25.2 million veterans in 2003). By 2030, 15% of older veterans will be aged 85 or older (1.0 million). Thus, VA will encounter a large cohort of potentially frail elderly veterans in the next 25 years.

To meet the challenge of an expanding aging veteran population, VHA has developed an extensive continuum of health care services targeting the needs of this group. This includes an increasing focus on home and community-based programs, as well as coordinated use of hospital and nursing home programs. Together these programs provide preventive, acute, rehabilitative, and extended care on an outpatient and/or inpatient basis. Examples of VHA geriatrics and extended care programs include home-based primary care, homemaker/home health aide services, respite, adult day health care, domiciliary, geriatric primary care, specialty geriatric evaluation and management, specialized Alzheimer's and related dementia care, nursing home care, and hospice. In addition to its own direct provision of care, VHA also contracts for certain services (e.g., community nursing home care) and participates in others through a grant program to State Veterans Homes (nursing home, domiciliary, and adult day health care).

For more than 25 years, the VA has also provided leadership in research, training and education in geriatrics and long-term care (Kizer, 1996). VHA funds a wide range of aging-related research on basic biomedical, applied clinical, rehabilitation, and health services topics, as well as cooperative (multisite) studies. In 1975, the VA established centers of excellence in geriatrics called Geriatric Research, Education and Clinical Centers (GRECCs), whose mission is to improve the health and care of older veterans through research, education, and training, and the development and evaluation of innovative models of care. GRECCs are widely recognized as having provided leadership in geriatrics and gerontology, both within the VA and throughout the nation (Goodwin & Morley, 1994). Currently, there are 21 GRECCs across the VA system, each with a specific programmatic focus, which include among others: neuroscience, including dementia; endocrinology, especially diabetes; rehabilitation of stroke and other disorders; osteoporosis; falls and gait disorders; exercise; immunology; cardiovascular diseases; and palliative care. GRECCs as well as selected other VA medical centers provide physician fellowship training in geriatric medicine, constituting the largest source of trained geriatricians in the nation. In addition, VHA pioneered the concept and practice of interdisciplinary team training in geriatrics and has developed advanced training programs in geriatrics for psychiatrists, neurologists, dentists, nurses, and psychologists. Students from multiple other health care disciplines (e.g., social work, pharmacy, optometry) gain geriatrics experience during their training rotations in VA clinical settings. VHA also provides aging-related continuing education for professional staff from the VA and the community on a regular basis.

Current VHA aging initiatives include the integration of geriatrics with primary care and mental health care. A variety of research and education activities are underway to identify best practice models of integrated care and to disseminate this information to health care providers in outpatient and inpatient clinical settings.

Through its efforts on behalf of America's veterans, the VA paved the path in the development of health care for all older Americans. Now in the 21st century it is well positioned to continue its leadership role in meeting the challenge of fulfilling the health care needs and improving the quality of life for the future's cohort of aging veterans, as well as all older Americans.

For additional information on the VA and its programs and services for older veterans, visit the following Web sites: VA at www.va.gov; the Veterans Benefits Administration at www.vba.va.gov; My Health e Vet at www.myhealthevet.va.gov; and VHA Geriatrics and Extended Care Strategic Health Care Group at www.va.gov/geriatricsshg.

Susan G. Cooley

Statements and opinions are not necessarily those of the U.S. Department of Veterans Affairs.

REFERENCES

Cooley, S. G., Goodwin-Beck, M. E., & Salerno, J. A. (1998). United States Department of Veterans Affairs health care for aging veterans. In B. Vellas, J. P. Michel, & L. Z. Rubenstein (Eds.), *Geriatric programs and departments around the world.* Paris and New York: Serdi Publishers and Springer Publishing Company.

Goodwin, M., & Morley, J. E. (1994). Geriatric research, education and clinical centers: Their impact in the development of American geriatrics. *Journal of the American Geriatrics Society, 42*, 1012–1019.

Kizer, K. W. (1996). Geriatrics in the VA: Providing experience for the nation. *Journal of the American Medical Association, 275*(17), 1303.

U.S. Census Bureau. (2004, June 14). Table 1: Annual estimates of the population by sex and five-year age groups for the United States: April 1, 2000 to July 1, 2003 (NC-EST2003-01. Available: http://eire.census. gov/popest/data/national/tables/ NC-EST2003-01.pdf

U.S. Department of Veterans Affairs. (2002). VetPop2001 adjusted to census 2000. Available: www.va.gov/ vetdata/demographics/index.htm

U.S. Department of Veterans Affairs. (2004, May). Organizational briefing book. Available: www.va.gov/ ofcadmin.orgbrfbook.pdf

VISION

See
Low Vision

VISION CHANGES AND CARE

Caring for older adults' visual systems is multifaceted and multidisciplinary. It involves optimizing sight, vision, eye coordination, visual perception, and eye health. With older adults, it is important to understand that there is a difference between sight and vision. Measuring *visual acuity* is synonymous with sight, whereas *vision* refers to how one functions or interacts with the environment. Decreased visual functioning can lead to other sensory, motor, and emotional disorders that are risk factors for dependency and institutionalization. Sensory loss significantly impacts interaction with the environment, and the ability to function easily and safety contributes to successful aging (Fangmeier, 1998).

Visual Impairment

Visual impairment means good visual functioning cannot be achieved with conventional glasses or contact lenses. Mild visual impairment is present when everyday activities such as reading the newspaper or medication labels and threading a needle cannot be easily or efficiently accomplished. When activities of daily living (ADL) are affected because the best corrected visual acuity is 20/50 or worse, a person has mild visual impairment, or "functional" visual impairment. Mild visual impairments are not necessarily caused by ocular disease. The visual system undergoes various age-related changes that are considered "normal" because they are not caused by pathology. For example, presbyopia denotes decline in near visual acuity because the lens loses the ability to focus and leads to the need for reading glasses or bifocal lenses.

Retinal sensitivity

Visual acuity may also decline because light sensitivity decreases as the number and function of retinal cells decrease. Other consequences of lowered retinal sensitivity include reading fatigue and difficulty functioning in dimly illuminated places. Increasing lighting to at least 75 to 100 watts helps patients with decreased retinal sensitivity. Incandescent lighting may be preferred over fluorescent because flickering fluorescent lights can cause discomfort. However, fluorescence is more energy-efficient and cooler. Compact fluorescent lighting has eliminated some problems typically associated with fluorescent lighting, and the bulbs fit into sockets of typical incandescent lamps. Although uniform room lighting from a central source helps eliminate dark areas and minimize glare, task lighting is very important for seeing fine details. Adjustable task lights with an integrated magnifying glass can be beneficial (Figueiro, 2001). Portable lighting such as mini-flashlights may help significantly in dimly lit situations. For older adults, lighting can make the difference between efficient visual functioning and not functioning.

Contrast sensitivity

Contrast sensitivity, or the luminance difference between the object and background, declines because of age-related central nervous system changes, decreased retinal sensitivity to light, and pupillary miosis decreasing the amount of light entering the eye. Reduced contrast sensitivity can lead to blurry vision, decreased reading efficiency, and fatigue. Increased lighting, placing yellow filter paper over poorly contrasted reading material, using black lettering on a white background, and enhancing contrast of reading materials by magnifying the print with magnifiers can be helpful. Announcements for seniors should use black letters on white background or vice versa rather than light-colored letters on a white background. Decreased contrast sensitivity also threatens safety. Older adults may have difficulty navigating stairs or curbs because of problems judging changes in heights. Contrast can be improved by affixing a strip of bright carpet at the base of stairs or using orange paint on curbs to cue changes in height.

Useful field of view

Age-related neuronal degeneration in the visual cortex affects the speed of visual information processing. Older adults do not see quickly and thus lose efficiency in interacting with the environment. Reading is slower and safety becomes an issue. Decline in processing visual information reduces the useful field of view (UFOV), a dynamic visual field that evaluates information acquired in a single glance. It is a measure of the field of visual attention. Unlike standard visual field testing that looks at the size of the visual field, UFOV involves detecting, localizing, and identifying targets amid distractions. A limited UFOV affects the ability to spot faces in a crowd, detect a single traffic sign in the midst of many, and navigate an intersection. Clinically, UFOV status is determined by case history, or a Visual Attention Analyzer. Current research points to the role that vision plays in driving safety (Owsley, 2003). When managing patients suspected of having UFOV deficits, education about their altered field may result in elders focusing on or avoiding difficult situations such as driving at night, in the rain, or during rush hour. It may also help to find alternate routes or make three right turns in place of making a left turn. Vision-therapy exercises, such as tachistoscopic training, allow patients to practice visually localizing a target in the presence of distracting stimuli. Health care providers should ask about driving and make referrals to exclude general health or visual complications. The Association of Driver Rehabilitation Specialists is a good resource to help improve driving skills.

Dark/light adaptation

Abrupt changes in lighting may be problematic due to a decrease in dark/light adaptation. The rod and cone retinal cell function slows and pupil miosis causes less light to enter the eye. It takes longer for the visual system to adjust to a dimly lit area after having been in bright light or vice versa. The classic consequence is difficulty with night driving, maneuvering through tunnels, and entering or exiting dark theaters. Safety recommendations include education, wearing sunglasses outdoors to keep pupils in a darker adapted state, and maintaining a constant level of lighting indoors.

Glare

Glare is caused by pupil miosis, which increases light scatter. Media opacities from common ocular disease like cataracts also cause light to scatter as it enters the eye. Retinas become less able to process extraneous light. A bright light or poorly positioned lighting can create a dazzling sensation that produces discomfort and/or interferes with vision. Consequences of glare include reduced vision, difficulty driving at night, using a computer, and reading (especially glossy paper on which more light is reflected). Wearing sunglasses, hats, or visors; placing shades or sheers on windows; using matte-finish paint; placing light sources outside the line of sight and antiglare coating on eyeglasses; as well as cleaning windows, windshields, headlights, and dashboards are recommended. Computers should be placed so that the daylight from a window comes from the side and not from the front or back. Additionally, an antireflective computer-screen guard reduces glare (Berman, 1998).

Assessment

"Normal" visual changes often go undetected because older adults do not report them. The symptoms may be vague and therefore overlooked by clinicians, or the elder may not be questioned about them.

One key assessment strategy for screening for mild vision impairment is to ask pertinent questions. The following questions can be used to uncover functional vision problems. If the answer to any of the questions is "yes," a full eye exam is recommended.

1. While Wearing Your Eyeglasses or Contact Lenses: Is there anything that you cannot do because of your vision?
2. While Wearing Your Eyeglasses: Does your vision interfere with shopping, cooking, watching television, handling money (e.g., writing checks, paying bills), reading the newspaper, using the telephone, using the telephone book, reading a book, or threading a needle?
3. In the past month, have you needed assistance with any activities listed in Question 2?
4. How many falls have you experienced in the last year?
5. Do you feel that your falls are related to vision difficulties?
6. When did you obtain your current eyeglasses or contact lenses?
7. When wearing your eyeglasses or contact lenses, how would you rate the quality of your vision?
8. Do you have any eye problems? If so, what kind?
9. Are you bothered by glare?
10. Do you have problems adjusting to bright light when coming from a dark place such as a movie theater?
11. Do you have problems seeing in dim light such as in restaurants, houses of worship, movies?
12. Does it take a long time for your eyes to adjust to dim light when coming from a bright room, such as entering a movie theater?
13. Do you have night-vision problems?

14. Do you experience difficulty driving at night? During the day?
15. After reading for 30 minutes or less, does the print become blurry?
16. When reading, does the print become double?
17. Do you skip lines when reading?
18. Do you have good lighting in your home?
19. Do you have problems seeing with your side vision?

Low Vision

Severe visual impairment is described as legal blindness or partial sightedness. Legal blindness is a best corrected visual acuity of 20/200 or less in the better eye or a decrease in the visual field below 20 degrees. If the best corrected visual acuity in the better eye is 20/70 or worse, or the visual field is 30 degrees or less, then a person is partially sighted.

Legal blindness and partial sightedness are usually caused by ocular disease. According to the U.S. National Center for Health Statistics (1996), visual impairment in the noninstitutional population is 35% for those 65 year and older versus 13% for those under age 65. The American Optometric Association reports that 51.7% of those legally blind, 53.7% of the partially sighted, and 70% of the functionally visually impaired are 65 and older.

Low vision describes visual impairment whether it is legal blindness, partial sightedness, or functional visual impairment. Eye care practitioners who specialize in caring for patients with low vision perform low-vision examinations and make recommendations to enhance visual functioning. The technology boom has significantly improved electronic magnification devices that are now more accessible due to decreased costs and size, as well as increased portability (Harvey, 2004).

Tanya L. Carter

See also

Cataracts
Eye Care Providers
Glaucomas
Low Vision
Vision Safety

Internet Resources

Aging and Your Eyes
http://www.seniors.tcnet.org/articles/article06.htm

Resources for Individuals with Visual Impairment, American Academy of Ophthalmology
http://www.eyenet.org/public/pi/resources/low_vision_resources.html

Visual Care of the Elderly
http://www.optom.demon.co.uk/elderly/elderly.htm

Association of Driver Rehabilitation
http://www.aded.net

MFL Occupational Health Center, Inc
http://www.mflohc.mb.ca

RNIB
http://www.mib.org.uk

REFERENCES

Berman, T. (1998). Into the light: New energy-saving lighting system cuts computer glare and boosts employee comfort. *Buildings*, *92*(8), 30.

Fangmeier, R. 1998. The world through their eyes. Understanding vision loss: A manual for nursing home staff. New York: The Lighthouse, Inc.

Figueiro, M. G. 2001. *Lighting the way: A key to independence*. Lighting Research Center, Troy, NY

Harvey, B. (2004). Electronic low vision aids: A new image for the visually impaired. *Optician*, *227*(5948), 22–24.

Owsley, C. (2003). Vision impairment and driving. *In vision, aging, & driving symposium*. January 26, Orlando, FL.

VISION SAFETY

It is estimated that two-thirds of persons with low vision are older than the age of 65. Low vision exists when ordinary glasses, contact lenses, medical treatment, and/or surgery are unable to correct sight to the normal range. Legal blindness is defined as

20/200 or less with corrected vision (i.e., glasses or contact lenses) or less than 20 degrees of visual field in the better eye. Studies indicate that visually impaired older adults have more functional limitations, health problems, and postural instability that place them at risk for falls and are more dependent on others than older adults who are not visually impaired (Miller, 2004). Therefore, a diminished ability to see affects their safety.

The major causes of visual impairment in older adults are cataracts, glaucoma, macular degeneration, and diabetic retinopathy. Some of these conditions may be surgically corrected or prevented from causing additional visual loss with administration of specific medications. It is essential to determine how well the older adult with low vision can function safely within the environment to enhance remaining vision and provide adaptations for daily living.

Care Strategies for Low Vision

Low vision can affect an older adult's ability to perform activities of daily living (ADL) such as dressing, using the telephone, shopping for food, preparing meals, taking medications safely, managing money, and driving or arranging for other forms of transportation independently. Moreover, low vision can also affect leisure activities such as reading, watching television, and activities requiring near vision, such as needlepoint (Miller, 2004).

The plan of care should address environmental adaptations for daily living, safety and security measures, glare and illumination, magnification devices, use of contrasting colors, and community resources. Frequently called numbers should be in large bold print near the telephone or programmed into an electronic telephone that has a large face. Door exits should be identified with contrasting colors. Stove, oven, and microwave dials can be marked with colored tape to create contrast. Keys can be identified with contrasting colors or large labels. Smoke-detector batteries should be replaced regularly.

Medication container labels should use large, bold print with high color contrast to indicate dosage, administration time, and any specific directions or drug warnings. Brightly colored dots can be used to distinguish medication containers for those who have the ability to differentiate colors; otherwise, tactile markers can be used. Daily or weekly pill dispensers and "talking" watches and clocks can help maintain a medication schedule. More than 100 Web sites contain low-vision aids. Many of these sites sell the products; others are Web sites of vision centers that recommend low-vision aids.

Safety and Security Measures

A room-by-room review for cluttered furniture, loose carpeting, and other pathway hazards can identify environmental risk. Lighting is the single most important intervention that improves vision and is most easily adapted to improve visualization and reduce risk of falling (Ryan & Spellbring, 1996). Lighthouse International recommends experimenting with fluorescent and incandescent light bulbs to find which bulbs work best in providing sufficient light without glare. A night light in the bedroom, bathroom, and kitchen will aid eye accommodation in going from dark to light. Sensor-operated night lights that turn on as the older adult enters the darkened room are inexpensive. Extra lighting is essential in high-risk locations—bedroom, stairs, halls, and bathroom. The path from the bedside to the bathroom benefits from extra lighting at night for bathroom use.

Fall Prevention

With a decline in vision and other sensory losses, older adults are at an increased risk for falls. The most important sensory system responsible for good balance is the visual system, followed by the vestibular system and the somatosensory system. Additionally, older adults tend to place greater reliance on their vision, even when there are visual deficits (Newton, 2003). Therefore, a fall assessment and initiation of a fall-prevention program are essential.

Driving Safety

Driving is a particular safety concern, not only for the older adult but also for others on the road. Owsley found that drivers with cataracts were 2.5 times more likely to have an "at fault" crash. Cataract surgery and intraocular-lens implantation reduces their risk of crash involvement by a factor of 2 compared with those who did not have surgery (Owsley et al., 2002). Many feel that the vision tests given through the state Department of Motor Vehicles are inadequate to detect vision changes that affect safety; although some have urged alternative vision tests, at this time no state has implemented them.

By 2050, it is estimated that 50 million people 65 years and older will be eligible to drive (Higgins, 2003). The future may look brighter for older adults who utilize low- or high-technology assistance. Low-tech items include a mirror system to expand the field of vision. Stick-on minifying mirrors placed on the interior and exterior mirrors also widen the field of vision (Peli and Peli, 2002). High-tech solutions include video cameras mounted on the rear of a car and connected to a dashboard display, radar and ultrasound warning systems to detect impending collision, adaptive cruise-control units to adjust speed when the following distance becomes too short to avoid a collision, and navigational aids and night-vision systems (Higgins, 2003). Research should focus on both the new product development and the user interface to avoid new problems that might interfere with older adults' driving safety (Higgins, 2003).

Glare

Older adults have a decreased tolerance of glare. The glare of bright lights may impair driving at dusk and at night (Miller, 2004). Thin draperies and adjustable blinds can reduce the amount of sunlight entering the room and reduce glare. Sunglasses and tinted lenses should be worn when going outdoors to ease accommodation to bright light.

Color Contrasts

Older adults have difficulty distinguishing between blue and green but can better differentiate red, orange, and yellow. Impaired depth perception may make it difficult for the older adult to judge distances and surface levels, which can increase the risk for falling. Contrasting colors should be placed on doorways and stairs to indicate a change in the height or depth of a surface (GeronurseOnline.org). Toilet-seat covers can also be contrasted to wall and floor surfaces (Miller, 2004).

Assistive Devices to Aid Magnification

Many simple household products can enhance vision (see www.nei.nih.gov). Both optical and nonoptical products can bring objects closer or make them bigger. Pocket magnifiers allow for near-vision enhancement such as money identification and putting on makeup. Hand or stand magnifiers can assist with reading, and portable video magnifiers can aid both reading and writing.

Ann Marie Spellbring
Ann A. Scheve

See also
Cataracts
Eye Care Providers
Glaucomas
Low Vision
Vision Changes and Care

Internet Resources
National Eye Institute
http://www.nei.nih.gov

geronurseonline.org
http://www.geronurseonline.org/

Light House International
http://www.lighthouse.org

NIH Senior Health
http://www.nihseniorhealth.gov/cataract/toc.html
http://www/nihseniorhealth.gov/glaucoma/toc.html

http://www.nihseniorhealth.gov/agerelatedmaculardegeneration/toc.html

The NIH Word on Health
http://www.nih.gov/news/WordonHealth/jun2000/story04.htm

REFERENCES

Higgins, K. E. (2003). Driving and vision in an aging society. *Generations*, *27*(1), 57–63.

Miller, C. A. (2004). *Nursing care of older adults*: *Theory and practice* (4th ed.) Philadelphia: Lippincott.

Newton, R. A. (2003). Balance and falls among older people. *Generations*, *27*(1), 27–31.

Owsley, C., McGwin, G., Jr, Sloane, M., Wells, J., Stalvey, B. T., & Gauthreaux, S. (2002). Impact of cataract surgery on motor vehicle crash involvement by older adults. *Journal of the American Medical Association*, *288*(7), 885–886.

Peli, E., and Peli, D. (2002). *Driving with confidence: A practical guide to driving with low vision*. Hackensack, NJ: World Scientific.

Ryan, J. W., & Spellbring, A. M. (1996). Implementing strategies to decrease risk of falls in older women. *Journal of Gerontological Nursing*, *22*(12), 25–31.

VOLUNTEERISM

The call to volunteerism and various forms of citizen participation in human service delivery is not new in the United States (Midlarsky & Kahana, 1994). The Judeo-Christian ethos of love, sharing, and humanitarianism has served to mobilize individuals and organizations of all ages and beliefs toward energetic, continuing improvement of our nation's vast networks of social programs, agencies, and services. Thoughtful, caring activity and charitable responsibility have become deeply ingrained in the American character, irrespective of one's gender, age, religion, ethnicity, occupation, socioeconomic status, or educational attainment. Volunteer service has evolved as a tradition, simultaneously spanning fields of health and mental health, child welfare, education, corrections, and aging, among others. Various community membership, mutual aid, social action, and advocacy organizations provide a continuing backdrop for persons of all ages who seek opportunities for creative utilization of increased leisure time.

President Ronald Reagan's 1983 proclamation of a national year of volunteerism urged citizens and organizations to strengthen voluntary structures and recruit additional persons as contributors to further America's rich tradition of community service. In recent years, as financially pressed governments reduced funding for social programs and services, numerous individuals and voluntary organizations have found additional motivation to support new, innovative solutions to existing community problems. Although volunteers provide vital human services in many agencies and organizations, there are some who cautiously suggest that volunteers cannot always substitute for professional personnel with education and experience in the human service disciplines.

As the nation advances further into the 21st century, it is imperative that gerontologists, geriatricians, and health care and social service professionals sustain the vision and goal of successful, productive aging in response to the carefully predicted growth of America's older population (Rowe & Kahn, 1998). A vision of the positive aspects of aging must replace our preoccupation with disability, disease, and chronological age for millions of older adults who will "age-in-place" or reside in the nation's rapidly accumulating array of continuing-care facilities.

Accompanying the "graying of America" is the present trend toward earlier retirement of mature, older workers. For many years, retirement was viewed as a critical, voluntary life transition. Increasingly, gerontologists, economists, and social and behavioral scientists approach the subject of retirement as a highly anticipated life transition, linked to such factors as financial security, an opportunity to begin long-delayed couple activities, expected intergenerational roles, and community-service responsibility. In reality, the previously held theory of retirement as a single life transition has evolved as many mature individuals make additional transitions to "unretirement" (Euster, 2004). Hooyman & Kiyak (2002) cogently describe retirement satisfaction as affected by opportunities to learn and feel useful, including activities that provide autonomy and a sense of personal control. Atchley (1993), in discussion of continuity theory, believes that middle-aged and older adults are both predisposed and motivated in the direction of inner psychological continuity, as well as outward continuity of social behavior.

For growing numbers of retired older adults, commitment to volunteer community service allows for interpersonal continuity within comfortable social and work environments, utilization of lifelong competencies and skills, linkages with familiar persons, and sources of social support. For many older adults, volunteer participation generates feelings of inner success, mastery, and generativity, strengthening and rewarding significant social interactions. A recent study of older adults who mentored at-risk youth (Larkin, Sadler, & Mahler, 2005) concluded that mentoring experiences allowed volunteers to renew positive emotions and reinforce meaning in their lives. Euster (1997), in an extensive study of community-service activities of retired professional athletes, concluded that their continuing volunteer roles reflected an altruistic "contract" with their respective communities. After successful careers as members of professional sports organizations, many retired athletes choose community-service activities as productive substitutes for on-the-field and on-the-court roles. These retirees often described their service activities as a means of "giving back" to their communities. Many persons engaged in volunteer training and management believe that older adults who perform volunteer services tend to have an established history of earlier life volunteerism. Indeed, many persons clearly do not discard such activities as they grow older. Many view their community-service activities as a form of reciprocity for acts of kindness that they received during their lifetime.

It is widely recognized that older volunteers introduce a vast amount of experience, knowledge, creativity, and energy as they assume volunteer roles. Senior volunteers tend to have higher incomes, greater education, and fewer functional and physical impairments. Findings of the well-known Marriott Seniors Volunteerism Study (Marriott Senior Living Services and the U.S. Administration on Aging, 1991) provide impressive evidence of the commitment of older adults to volunteer service. More than 41% of Americans 60 years of age and older performed some form of volunteer work; 37% are potential volunteers who may be willing to volunteer. The desire to help others, feel useful, moral responsibility, and social responsibility were the major reasons for volunteering among persons 60 years of age and older. The Marriott and other studies confirm that the volunteer work by older adults is carried out to a large extent within religious organizations.

In recent years, however, there has been considerable variation in sponsorship of volunteer opportunities for older adults and the service settings in which they participate. Currently, the federal government helps support an administrative entity, the Corporation for National and Community Service. Senior Corps, a program of the corporation, has maintained three highly visible, quality programs for several years. The Foster Grandparents program utilizes low-income citizens aged 60 or older to provide interpersonal care to children with special and exceptional needs. Through this intergenerational program, assistance may be offered to children who have been abused and neglected, troubled teenagers, young mothers, premature infants, or children with physical disabilities. Senior Companions also recruits low-income seniors to provide emotional support and assistance to frail and homebound elders. The program aims to help at-risk older adults remain in their homes and community. Perhaps the most widely recognized program, the Retired Senior Volunteer Program (RSVP), engages older adults in community-defined and -supported projects. RSVP volunteers may provide services in such settings as hospitals, schools, libraries, nursing homes, and community-service agencies. Volunteer activities may include home repair, shopping assistance, respite care, telephone reassurance, assistance with tax preparation, and youth tutoring. Other volunteers may offer aid to terminally ill persons, support community-policing efforts, or teach English to recent immigrants.

For many years, the American Association of Retired Persons (AARP) has been committed to volunteer service at the national, state, and local levels. AARP volunteers, through 2,300 chapters in the United States, Puerto Rico, and the Virgin Islands, offer a range of outreach services that include mentoring, food and clothing drives, friendly visiting, defensive-driving education, and job-search assistance. AARP volunteers are widely recognized for helping older citizens complete income-tax returns. Some volunteers assist older persons with low or moderate incomes to locate benefit programs that help pay for prescription medications, groceries, property taxes, and other expenses. In some communities, AARP volunteers collaborate with organizations such as Habitat for Humanity and Meals On Wheels.

Older adults are identified with many other volunteer efforts, including corporate retiree projects, adopt-a-school programs, and crime-watch organizations. Volunteers often assist widowed persons through mutual-support groups, carry out lifelong-learning instruction, and serve communities as museum docents and curatorial assistants. Many serve as food-bank workers and drivers; others audiotape reading materials for visually impaired persons. Increasingly, older adults volunteer or are recruited to serve as citizen representatives on state boards, advisory councils, and commissions.

Volunteer services for older citizens are well established in most communities and performed by persons of all ages. Thousands of community volunteers offer assistance to Meals On Wheels and nutrition site programs; provide respite for family caregivers of homebound adults; and offer transportation/escort services for seniors unable to attend religious services or make health care appointments. Many churches and synagogues have developed "adopt-a-grandparent" programs for seniors without extended families. Numerous organizations have sponsored volunteers who bring companion animals to visit older persons confined in continuing-care facilities. Boy and Girl Scouts serve as visitors and Pen Pals to nursing home residents; church and synagogue youth groups often provide entertainment and recreational assistance to seniors confined to such facilities.

The steady growth of volunteerism in American communities appears to be an inevitable outcome of the nation's humanitarian spirit. Growing evidence of the professionalization of volunteer-management personnel provides hope that more effective programs and services by and on behalf of older citizens will evolve in the years ahead. It is clear that substantive staff and volunteer training programs will be required to ensure that the remarkable efforts of volunteers of all ages are woven into the existing fabric of quality services to older citizens.

GERALD L. EUSTER

See also

Employment
Retirement
Spirituality

Internet Resources

American Association of Retired Persons
http://www.aarp.org/

Corporation for National and Community Service
http://www.nationalservice.org

Elderly Care and Assisted-Living Information
http://www.living-assisted.com/

Generations United
http://www.gu.org/about.asp

National Service-Learning Clearinghouse
http://www.servicelearning.org/

REFERENCES

Atchley, R. C. (1993). Continuity theory and the evolution of activity in later adulthood. In J. R. Kelly (Ed.), *Activity and aging: Staying involved in later life*. Newbury Park, CA: Sage Publications.

Euster, G. L. (1997). *Great heroes, great deeds: Volunteer service activities of retired professional athletes*. Columbia, SC: University of South Carolina.

Euster, G. L. (2004). Reflections upon university retirement: With thanks and apologies to James Joyce. *Educational Gerontology*, *30*, 119–124.

Hooyman, N. R., & Kiyak, H. A. (2002). *Social gerontology: A multidisciplinary perspective*. Boston, MA: Allyn & Bacon.

Larkin, E., Sadler, S. E., & Mahler, J. (2005). Benefits of volunteering for older adults mentoring at-risk youth. *Journal of Gerontological Social Work*, *44*, 23–37.

Marriott Senior Living Services (1991). *Marriott seniors volunteerism study*. Washington, DC; U.S. Administration on Aging.

Midlarsky, E., & Kahana, E. (1994). *Altruism in later life*. Thousand Oaks, CA: Sage Publications.

Rowe, J. W., & Kahn, R. L. (1998). *Successful aging*. New York: Pantheon.

W

WANDERING

Definition and Dimensions

Wandering is a behavior that has myriad definitions and connotations. A small child may wander from home, drawn by new and intriguing sights. A college student may purchase a Eurail Pass that allows unscheduled roaming from town to town. A family on a camping weekend may stroll through the woods, enjoying the quiet and beautiful setting. In each of these situations, the "wandering" behavior is viewed as meaningful human activity. However, when the person is old and has cognitive impairments, wandering is viewed as both a symptom of dysfunction and a problem. It is indeed a concern for caregivers of persons with dementia and/or delirium because of the risk for harm to the individual and liability to the institution.

In the health care context, wandering resists a single definition, although all agree that it involves walking-type movements within or between settings. It is commonly classified as one of several types. For example, it could be classified as purposeful or random. Purposeful wandering might include seeking a place or a person, or even unescorted exiting, often called *elopement*, from health care facilities (Connell, 2003). The early efforts of Algase, Beattie, Bogue, and Yao (2001) to conceptualize wandering identified five dimensions of ambulating behavior of persons with dementia: frequency, pattern or quality, boundary transgressions, deficits in navigation or way-finding, and temporal distribution. These dimensions form the core of the Algase Wandering Scale (AWS). More recent work produced a modified tool (i.e., AWS-V2) with the addition of subscales for attention shifting and shadowing. Attention shifting refers to whether the individual can be distracted, interrupted, or redirected from the walking activity. Shadowing includes searching for another person and following or seeking others (Algase et al., 2004).

Explanations

Work on the definitions and dimensions of wandering has touched on possible explanations for the behavior among persons with dementia. Other proposed explanations include cognitive dysfunction, unmet needs, personality, and pre-morbid patterns of physical activity. Some individuals have a well-established pattern of walking for pleasure, as part of their occupation, or as a stress-relieving activity. Whatever the explanation, health care providers have come to accept it as a common behavior among persons with dementia that meets some needs and should not be prevented. Rather, the current emphasis is on efforts to meet unexpressed needs and maintaining safety for the wanderer (Dewing, 2005).

Interventions

Interventions focus on the individual, the staff or family caregiver, and the setting. The individual focus is concerned with determining whether wandering represents unmet needs that might be addressed. For example, if incontinent episodes follow a flurry of motor activity, caregivers should be alert for this activity and schedule toileting accordingly. For the resident who has always been physically active, an individualized exercise/activity plan might be helpful. For the resident whose excessive pacing interferes with mealtime, provide finger foods that can be eaten "on the run" rather than trying to force a sit-down meal. If the individual is distressed, seek to find strategies to reduce that distress. Some people respond to music, others to a comfort item such as a stuffed animal. If the resident shows no signs of distress and presents no danger to self or others, there is no reason to intervene with wandering.

The way in which caregivers respond to wandering can ward off problems or escalate them. In the nursing-home setting, staff should employ a friendly, gentle approach to redirect a resident away from exits, other residents' rooms, and the nurses' office. Distraction works well with many persons with dementia. Simply striking up a conversation and inviting the person to come with you often is effective. Unless there is real danger (e.g., walking into traffic), physical restraint may trigger panic and result in harm to the patient and the care provider.

The environment is an important consideration in relation to wandering. One aspect of special care units within nursing homes that emerged in the 1980s was design that facilitated safe wandering. Resident care areas were designed for smaller groups of persons with shorter halls that made it easier to monitor the activity of residents. More open layouts allowed residents to see their destinations more easily. Exit doors were positioned near staff work areas rather than at the end of hallways. Although safety codes required exit signs, painting the door the same color as the surrounding walls made it less inviting. Secure outdoor walking paths were incorporated with points of interest along the way. Systems were installed that sounded an alarm if a door from the controlled area was opened.

Technology has continued to advance the options for preventing elopement, and at the same time has raised some questions about patient surveillance and privacy. Long-term-care residents who are prone to elopement may be fitted with a device such as a bracelet that alerts the staff if the resident leaves specific areas. One sophisticated system locks the door when a resident wearing the device approaches and unlocks it when the resident moves away from the door. Also, devices now are available that use GPS technology to aid in locating a lost person (British Geriatrics Society, 2005).

Caregivers in the home or assisted-living setting must be vigilant and creative to prevent harm to the person who wanders. Home caregivers should be taught to use the same strategies outlined for professionals. Some patients will recognize signs such as "Do Not Enter" or red "stop" signs as a means of controlling exits. Placing new locks higher or lower than the usual door locks may be effective. In addition, the home must be examined for dangers such as basement stairs that might best be made inaccessible. Community-dwelling persons with dementia should wear medical-alert tags with a telephone contact number. Enrollment in the "Safe Return" program of the Alzheimer's Association is recommended. For enrollees, an identification bracelet or necklace is provided; personal information and a photograph are kept on file. If the individual is missing, the Safe Return program initiates a community effort to locate the person.

ADRIANNE DILL LINTON
MARY (KELLY) DUNN

See also

Environmental Modifications: Home
Environmental Modifications: Institutions
Signage
Technology

Internet Resources

Alzheimer's Association Safe Return Program
http://www.alz.org.Services/SafeReturn.asp#id

Product catalog to manage wandering
www.aoa.gov/alz/media/pdf/safety_catalog/wandering.pdf

Project Lifesaver
http://www.projectlifesaver.org

NIH Senior Health: Home Safety and Wandering:
http://nihseniorhealth.gov/alzheimerscare.html

REFERENCES

Algase, D. L., Beattie, E. R. A., Song, J-A., Milke, D., Duffield, C., & Cowan, B. (2004). Validation of the Algase Wandering Scale (version 2) in a cross cultural sample. *Aging and Mental Health*, *8*(2), 133–142.

Algase, D. L., Beattie, E. R. A., Bogue, E., & Yao, L. (2001). The Algase Wandering Scale: Initial psychometrics of a new caregiver reporting tool. *American Journal of Alzheimer's Disease and Other Dementias*, *16*(3), 141–152.

British Geriatrics Society (2005). Electronic tracking of patients with dementia and wandering using mobile phone technology. *Age and Aging*, *34*, 497–518.

Connell, B. R. (2003, April). Why residents wander—and what you can do about it. *Nursing Homes: Long Term Care Magazine*, 50–55.

Dewing, J. (2005). Screening for wandering among older persons with dementia: Wandering and its related activity is a phenomenon engaged in by many persons with dementia. *Nursing Older People*, *17*(3), 20–24.

WEAKNESS

Weakness is one of the most common yet complex symptoms appearing in older adults. It represents one of the primary risk factors associated with falls, fractures, and disability in this population and has far-reaching physical, psychosocial, and financial consequences. Despite its prevalence in older adults, weakness has not been addressed as an explicit and unique symptom in the literature. The medical and health-related literature has referred to weakness as either part of a cluster of symptoms associated with multiple disease processes or as a secondary outcome of disabling conditions that produce alterations in mobility. Defined as a decrement in strength, endurance, or power, weakness is a multifactorial phenomenon characterized by a poorly understood interplay of factors.

Assessment of Weakness

Risk Assessment

Weakness is one of the most challenging symptoms for clinicians to assess, diagnose, and manage. An in-depth history should elicit risk factors predisposing the client to weakness. Risk factors for weakness in the older adult include biologic aging, multiple acute and chronic diseases and treatments used for their management, nutritional inadequacies, and/or lifestyle factors.

Age

Weakness is an inevitable sequela of aging. Increasing age brings structural and physiological changes in the musculoskeletal system that contribute to a loss of muscle mass, or what has been termed *sarcopenia*. By 80 years of age, muscle strength may decline by as much as 50% owing to loss of muscle mass from decreases in size and number of muscle fibers and the motor neurons that control function of strength producing skeletal muscles (type II, fast twitch). Independent of muscle-mass loss, age-related decreases in the strength generated per unit of muscle mass have been observed as have declines in muscle power or the capacity to perform muscular work per unit time (Mernitz & McDermott, 2004; Metter et al., 1999). Aging muscles have also been shown to experience greater cellular damage, particularly of mitochondria and DNA, triggering loss of endurance and contributing to weakness (Short et al., 2005). Added to these age-related changes are decreases in hormonal levels of total testosterone, estrogen, and growth hormone, all of which play a role in muscle maintenance.

Acute/Chronic Illness

Coexisting acute and chronic illnesses and their accompanying treatments represent a major risk factor for weakness in older adults. Superimposing illness on the age-related changes in muscle may compound existing muscle weakness. Many disease processes contribute to weakness by producing specific effects on skeletal muscle or limiting mobility and activity. Dramatic decreases in weakness may be induced by changes in mobility with a 1% to 3% loss of muscle strength occurring for every day of immobility (Halar & Bell, 1998).

The high incidence of chronic illnesses requiring multiple drug use, coupled with age-related changes in the absorption, distribution, metabolism, and excretion of medications, put this population at high risk for drug-induced weakness. Direct adverse reactions as well as indirect effects such as fluid and electrolyte imbalances from drugs (i.e., diuretics, electrolyte supplements, and/or laxatives) can induce weakness. Chronic substance abuse in this population can also precipitate weakness.

Nutritional Deficiencies

Older adults with poor nutritional health are at risk for the development of weakness. Age-related physiological and biochemical changes, the presence of chronic illnesses (including dementia and depression), and medications may lower the client's food and nutrient intake. Decreased dietary intake, by accelerating loss of weight and muscle mass, precipitates weakness. Although inadequate intakes of total energy and protein have been linked to structural and functional changes in muscle, musculoskeletal micronutrients (i.e., vitamin D, calcium, magnesium, phosphorous, zinc) predict muscle strength better than other nutritional indices (Fiatarone et al.,1994).

Inactivity

Sedentary lifestyle is a risk factor for weakness in the older adult. Not only current activity but also lifelong patterns of exercise influence muscle strength. At the very time age-related changes are contributing to decline and older adults should increase activity, they withdraw from it. Existing sensory changes and mobility problems, such as gait impairment, a history of falls, and balance problems, may also contribute to inactivity and increase risk of weakness.

Symptom Assessment

Patients may describe weakness in vague and nonspecific terms and may describe fatigue, dyspnea, dizziness, and pain. Its lack of specificity makes weakness challenging to assess. Greater specificity can be achieved through basic symptom assessment including the time pattern, quality, location, aggravating and relieving factors, and accompanying symptoms. Eliciting the patient, family, or caregiver's description of the weakness experience may assist in differentiating weakness from other symptoms.

A further challenge to assessment of weakness is the lack of objective, measurable loss of strength that accompanies the subjective feelings. Objective measures for assessing strength range from simple numerical scales that grade strength along a continuum, to precise equipment that quantifies the amount of strength exerted during movement. Anthropometric measurements and urinary markers (i.e., creatinine) provide additional information about weakness induced by changes in lean body mass (Kasper, 2003).

The extent to which weakness has interfered with a client's capacity to perform daily activities can be assessed by comparing the client's activities prior to and following the onset of weakness. Activities requiring greater muscle strength such as running errands, shopping, and yard and house work may be more impaired than self-care activities (Daltroy, Logigian, Iversen, & Liang et al., 1992). Determining the type of assistance the client requires to perform daily activities and the impact of the weakness on the client's family or primary caregiver will provide further insight into the nature, extent, and severity of the weakness.

Prevention of Weakness

Some causes of weakness are preventable, such as those resulting from lifestyle practices, treatments such as polypharmacy, and fluid and electrolyte imbalances. Older adults must be encouraged to adopt healthy nutritional and activity practices. Medication reviews and regular monitoring of a client's fluid, electrolyte (i.e., potassium, calcium, phosphate, magnesium), and nutritional status should also serve to detect problems and correct them before weakness develops.

Management of Weakness

Early intervention that maximizes the residual plasticity in aging muscle can curb the downward spiral of age-related muscle weakness. Interventions directed at weakness vary according to the nature of the weakness, its cause(s), the expected trajectory of the patient's illness, and the goals of the patient and family. A multidisciplinary approach should include the patient and caregiver(s).

Resistance training may alter, even reverse, age-related losses in muscle strength and power in healthy, community-dwelling older adults and frail, institutionalized elders. Strength-training programs, which vary depending on the patient's past and current activity pattern, functional status, level of mobility, and health history, use training stimuli that make muscles work harder than they are accustomed to working. To limit the risk of injury, training sessions should include warm-up and cool-down stretches, correct body mechanics, and proper breathing techniques to avoid breath-holding.

There is no consensus on the appropriate quantity, quality, or intensity of resistance exercise recommended to improve strength and power in the healthy older adult (Vincent et al., 2002). Evidence does not support an intensity threshold; both low- and high-intensity resistance exercise programs produce improvements in muscle strength (Fiatrone et al., 1994; Vincent et al., 2002). Gains in strength have been reported with 1 to 3 weekly sessions involving 2 to 3 sets of exercises, at 8 to 15 repetitions, and with an intensity ranging from 30% to 90% of maximum for all major muscle groups. The number of sets, repetitions, and amount of resistance is progressively increased to maximize muscle responsiveness as tolerated by the client. Adding a high-velocity stimulus has yielded increases in both muscle strength and peak skeletal muscle power. Weight-bearing aerobic exercises should be encouraged to preserve lean body mass and mitochondrial and DNA function and, in turn, muscle strength.

The benefits of nutritional supplementation are not universal, being most useful in elderly subpopulations with specific nutritional deficiencies (Fiatarone et al., 1994). Multinutrient supplementation in conjunction with resistance training in older adults does not surpass gains in muscle strength obtained through training alone (Fiatarone et al., 1994). Experts in strength-training, nevertheless, advocate for nutritional supplementation that provides extra calories, protein, and micronutrients to offset the increased energy expenditure accompanying strength-training.

The role of hormone replacement therapy (i.e., testosterone, growth hormone) in managing age-related losses in muscle mass and strength has yet to be clearly established (Borst, 2004). Evidence suggests that estrogen may preserve and augment muscle strength in postmenopausal women.

KATHY L. RUSH

See also

Deconditioning Prevention
Dyspnea (Shortness of Breath)
Fatigue

Internet Resources

International Council on Active Aging
http://www.icaa.cc/ResearchCenter/muscularstrength_new.htm

National Institute of Arthritis and Musculoskeletal and Skin Diseases
http://www.nih.gov/niams/

National Institute of Neurological Disorders and Stroke
http://www.ninds.nih.gov/

National Resource Center for Safe Aging: Best Practices
http://www.safeaging.org/model/default.asp

REFERENCES

Borst, S. E. (2004). Interventions for sarcopenia and muscle weakness in older people. *Age and Ageing*, *33*, 548–555.

Daltroy, L. H., Logigian, M., Iversen, M. D., & Liang, M. H. (1992). Does musculoskeletal function deteriorate in a predictable sequence in the elderly? *Arthritis Care and Research*, *5*(3), 146–150.

Fiatarone, M. A., O'Neill, R., Ryan, N. D., Clements, K. M., Solares, G. R., Nelson, M. E., et al. (1994). Exercise training and nutritional supplementation for physical frailty in very elderly people. *New England Journal of Medicine*, *330*(25), 1769–1675.

Halar, E. M., & Bell, K. R. (1998). Immobility: Physiological and functional changes and effects of inactivity on body functions. In J. A. DeLisa & B. M. Gans (Eds.), *Rehabilitation medicine: Principles and practice* (3rd ed., pp. 1015–1034). Philadelphia: Lippincott-Raven.

Kasper, C. E. (2003). Skeletal muscle atrophy. In V. Carrieri, A. M. Lindsey, & C. M. West (Eds.), *Pathophysiological phenomena in nursing: Human responses to illness* (3rd ed., pp. 389–412). St. Louis, MO: Saunders.

Mernitz, H., & McDermott, A. Y. (2004). Exercise and the elderly: A scientific rationale for exercise prescription. *Journal of Clinical Outcomes Management*, *11*(2), 106–116.

Metter, E. J., Lynch, N., Conwit, R., Lindle, R., Tobin, J., & Hurley, B. (1999). Muscle quality and age: Cross-sectional and longitudinal comparison. *Journal of Gerontology: Biological Sciences*, *54A*(5), B207–B218.

Short, K. R., Bigelow, M. L., Kahl, J., Singh, R., Coenen-Schimke, J., Raghavakaimal, S., et al. (2005). Decline in skeletal muscle mitochondrial function with aging in humans. *Proceedings of the National Academy of Science*, *102*(15), 5618–5623.

Vincent, K. R., Braith, R. W., Feldman, R. A., Magyari, P. M., Cutler, R. B., Persin, S. A., et al. (2002). Resistance exercise and physical performance in adults aged 60 to 83. *Journal of the American Geriatrics Society*, *50(6)*, 1100–1107.

WELL-BEING

See
Self-Rated Health

X

XEROSTOMIA

Saliva plays a major role in maintaining oral health, and alterations in salivary-gland function may compromise oral tissues and functions. Reduction in salivary flow most commonly manifests as symptoms of oral dryness. The subjective complaint of dry mouth is termed *xerostomia*, and the objective alteration in salivary performance is termed *salivary-gland dysfunction* (Atkinson & Fox, 1992). This distinction is important because not all dry-mouth complaints result from salivary dysfunction. The term *xerostomia* should be reserved for the symptoms of oral dryness only and not used synonymously for reduced salivary function.

Saliva is important for taste, mastication, deglutition, digestion, maintaining oral and soft tissues, controlling microbial populations, voice, and speech articulation. It lubricates the oral cavity and adequate salivary flow enhances movement of the tongue and lips, which aids in cleansing the oral cavity of food debris and bacteria. Saliva allows for proper tongue and lip movement necessary for clear articulation.

Dysphagia in the elderly can be caused by neurologic, systemic, psychologic, environmental, and oral changes. Patients with salivary-gland dysfunction often complain of difficulty swallowing. The oral preparatory phase of swallowing requires mastication and forming a food bolus which, in turn, depends upon a moist, lubricated oral mucosa, an intact dentition and periodontium, and fluid to wet the food. Transport during swallowing requires the lubricatory and wetting properties of salivary secretions. Saliva also aids digestion by helping the upper gastrointestinal tract rinse gastric secretions from the esophageal regions.

Causes of Salivary-Gland Dysfunction and Xerostomia

Xerostomia is most commonly associated with diminished salivary-gland function. However, the subjective complaint of dry mouth does not always correlate with the objective finding of decreased measured salivary flow rates (Fox, Busch, & Baum, 1987). Nonsalivary-gland circumstances, including changes in the patient's cognitive state, psychologic distress, mouth breathing, and sensory alterations in the oral cavity, may lead to the perception of dry mouth. Therefore, it is important to determine if salivary-gland function is actually decreased using objective measuring techniques.

Medications are the most common cause of decreased salivary-gland function, although the exact mechanism is not understood. Anticholinergic medications such as antihistamines often cause hypofunction. Sedatives, antipsychotics, antidepressants, and diuretics can induce xerostomia. Medication-induced xerostomia is reversed if the medication is discontinued or switched to one that causes less xerostomia.

In addition to medications, another iatrogenic cause of salivary-gland dysfunction is ionizing radiation, which is often used to treat head and neck cancer (Johnson et al., 1993). Salivary glands are often in the field of radiation, which destroys them permanently. Fibrosis of the muscles of mastication and pharyngeal muscles results in chewing and swallowing difficulties. Other iatrogenic causes include cytotoxic chemotherapy, internal radionuclides, and bone-marrow transplantation. Salivary-gland surgery may involve removal of the gland or may cause damage to the gland. Surgery is often performed for tumor removal, infection, stone removal, and duct stricture.

Systemic disease is also a common cause of salivary-gland dysfunction. Sjögren's Syndrome (SS) is a chronic autoimmune disease with lymphocyte-mediated destruction of salivary and other exocrine glands and primarily affects post-menopausal females. Other systemic conditions with prominent salivary involvement include cystic fibrosis, Bell's palsy, diabetes mellitus, amyloidosis, HIV, thyroid disease, malnutrition (i.e., dehydration, anorexia), and psychologic factors (i.e., affective disorder).

Contrary to common belief, salivary-gland function is generally well preserved in the healthy elderly. However, xerostomia is a common complaint found in up to 25% of institutionalized older adults and is often caused by systemic disease or its treatments (Schubert & Izutsu, 1987).

Hypersalivation is another common complaint in the geriatric patient population. However, salivary flow rates are frequently normal but motor function has been compromised, leading to decreased swallowing efficiency and the perception of increased salivary flow. Increased saliva production may be caused by medications and patients who wear dentures for the first time.

Diagnosis

The American–European Consensus Group Sjogren's Syndrome Classification is the most commonly used criteria set for the diagnosis of autoimmune-related salivary-gland dysfunction. Current criteria require evaluation of the oral condition that includes either whole saliva collection, parotis sialography, or salivary scintigraphy (Vitali et al., 2002). Several specific questions help differentiate salivary-gland hypofunction from the subjective complaint of dry mouth (Fox et al., 1987). These questions, which focus on oral activities that require adequate saliva production, are as follows:

1. Do you have difficulty swallowing dry foods?
2. Does your mouth feel dry while eating a meal?
3. Do you sip liquids to aid swallowing dry food?
4. Does the amount of saliva in your mouth most of the time seem to be too little, too much, or you don't notice?

A positive response to questions 1–3 or the perception of too little saliva is significantly associated with reduced salivary-gland function.

Technesium scans or saliva collection can determine quantitative salivary flow rates. Saliva collection determines if the salivary glands are producing within a normal range. Dentists with advanced education in oral medicine are trained to perform salivary-function evaluations. Salivary flow rates can be determined individually from the major glands or from all the glands (i.e., whole saliva) and are essential for diagnostic and research purposes.

Whole saliva is the mixed fluid contents of the mouth. Methods of whole-saliva collection include the draining method, spitting method, suction method, and the absorbent (i.e., swab) method. The draining and spitting methods are more reliable and reproducible for whole-saliva collection. Stimulated whole saliva can be obtained by having the patient chew on an inert material such as paraffin wax, unflavored gum base, or a rubber band.

Individual gland collection is performed using Carlson–Crittenden collectors. Individual collectors are placed over the Stenson's duct orifices and held in place with gentle suction. As saliva is produced, it flows through tubing into a preweighted vessel.

Stimulated individual gland saliva is obtained by applying 2% citric acid bilaterally to the dorsal surface of the tongue at 30-second intervals. Tubes are weighed before and after collection and flow rates are determined in mL/min per gland. Saliva collected should be collected on ice and frozen until analysis. Normal stimulated flow rate is approximately 1mL/min per gland.

Specific mechanisms of most causes of hypofunction are unknown. Irradiation results in a reduction in cells, a decrease in gland size, and fibrosis of the glandular parenchyma. Autoimmune exocrine disease is associated with inflammation and eventual loss of acini. The anticholinergic properties of medications also result in decreased salivary function. Even though the mechanisms of destruction are different, the result is the same—decreased salivary gland function and compromised oral functions.

Treatment of Salivary-Gland Dysfunction and Xerostomia

Treatment for xerostomia is limited; therefore, preventive measures must be emphasized.

Prevention

Proper shielding and positioning during radiation therapy to the head and neck region protect the salivary glands and other tissues. Radioprotective agents such as amifostine may protect the salivary glands during head and neck radiation, reducing salivary-gland destruction. Internal radionucleotides (i.e., I131) used to treat thyroid cancer can cause salivary-gland destructon. Following administration of I131, patients are encouraged to stimulate salivary flow by increasing hydration and sucking on sugarless candies or gum. Increasing salivary flow washes the I131 from the salivary glands and helps prevent gland destruction.

Dry-mouth patients have increased susceptibility to dental caries (Atkinson & Fox, 1993). Topical fluorides, available as rinses or gels, reduce caries and help preserve dentition. Gels can be applied by brush or in custom-made carriers that hold the material against the teeth. The frequency and mode of application must be individualized based on the extent of salivary hypofunction and caries activity. Stannous fluoride gel or neutral sodium fluoride gel effectively prevents caries. Neutral sodium fluoride is recommended when the taste of stannous fluoride is not tolerated. Neutral sodium is recommended for patients with multiple ceramic dental restorations. When coupled with improved dental hygiene and increased professional dental care (every 3 to 4 months), supplemental fluoride can help protect (although not guarantee) against rampant dental decay that can accompany salivary dysfunction.

Salivary-gland dysfunction is associated with increased salivary-gland infections. Preventive measures include milking salivary glands daily by gentle massage of the major glands; maintaining adequate fluid intake and hydration; sucking on sugarless candies; or wiping the oral cavity with glycerine swabs to stimulate salivary flow and help prevent mucous plug formation and salivary-gland infections. Dry-mouth patients also have an increased incidence of oral fungal infections and, to prevent caries, sugarless antifungal agents such as nystatin powder or clotimazole troches are recommended.

Treatment

Salivary-gland destruction is irreversible regardless of the method of damage. Potential treatments for salivary-gland destruction are active areas of research. Currently, treatment for salivary-gland dysfunction is limited to symptomatic treatments or systemic sialogogues. Saliva substitutes are available as rinses and gels; however, patients often prefer sipping water. The taste and mechanical stimulation of salivation from sugarless candy and chewing gum provide relief for some patients.

Several systemic sialogogues have been investigated. These agents are only useful for patients with functioning salivary glands. Limited clinical trials have shown that anetholetrithione is effective for mild medication-induced xerostomia. Clinical trials with the mucolytic agent bromhexine have yielded mixed results. Pilocarpine hydrochloride and cevmeline hydrochloride are parasympathetic agonists that increase salivary flow. These secretogogues have been shown to be effective in radiation- and SS-induced hypofunction. Side effects are common but often tolerated. Among other contraindications, pilocarpine and cevimeline should be used with caution in patients with a history of respiratory difficulty, heart disease, or glaucoma. Cevimeline more specifically targets the salivary glands and appears to be associated with fewer side effects (Fox, 2004).

Clinical trials have investigated autoimmune-disease–related xerostomia and treatments with the antirheumatic medication hydroxychloroquine and other disease-modifying antirheumatic agents, such as prednisone. Patients with SS are frequently prescribed such systemic medications. Serologic signs of disease activity improve and there are reports of improved salivary-gland function. However, the side effects may be severe and the effects on underlying gland pathology have not been demonstrated. These therapies cannot be recommended *solely* for treatment of salivary-gland dysfunction in primary SS. Nonsteroidal anti-inflammatories have not been shown to reduce dry-mouth symptoms or to improve salivary flow rates.

SS patients have the highest lymphoma risk (B-cell lymphoma) of any of the autoimmune diseases. SS patients with risk markers for lymphoma (i.e., cutaneous vasculitis, cryoglobulinemia, hypocomplementenemia) have been treated with rituximab, which is a monoclonal antibody that reacts with CD 20 antigen on B cells. These biologic agents are reserved for patients with severe manifestations of SS (Pijpe et al., 2005).

Researchers are currently investigating gene therapy as a future treatment modality for patients with radiation- or autoimmune-related salivary-gland destruction.

Conclusion

Salivary-gland hypofunction is not reversible. However, preventive measures and conservative treatments can avoid or limit mucosal breakdown, infections, and permanent damage to teeth. Symptomatic relief may be obtained with local measures and systemic secretogues in many patients. Clinicians should establish clear diagnoses, make certain that patients understand the causes of their dry mouth, and deliver the most efficacious preventive and management techniques available.

The presence of saliva impacts our daily activities. Saliva is required for support of the basic functions of the oral cavity—alimentation and communication. Management of symptoms and increasing saliva output may help patients feel more comfortable and improve the quality of their life.

MARGARET M. GRISIUS

See also

Geriatric Dentistry: Clinical Aspects
Oral Health Assessment
Swallowing Disorders and Aspiration

Internet Resources

Chemocare.com
http://www.chemocare.com/managing/dry_mouth.asp

Computer Retrieval of Information on Scientific Projects
http://www.crisp.cit.nih.gov

Internet Resources for People With Sjögren's Syndrome
http://www.dry.org

National Institute of Dental and Craniofacial Research
http://www.nidcr.nih.gov

National Institutes of Health
http://www.nih.gov

Oral Cancer Foundation
http://www.oralcancerfoundation.org/dental/xerostomia.htm

REFERENCES

Atkinson, J. C., & Fox, P. C. (1992) Salivary gland dysfunction. *Clinical Geriatric Medicine*, *8*(3), 449–511.

Atkinson, J. C., & Fox, P. C. (1993). Sjögren's syndrome: Oral and dental considerations. *Journal of the American Dental Association*, *124*(3), 74–76, 78–82, 84–86.

Fox, P. C. (2004). Salivary enhancement therapies. *Caries Research*, *38*(3), 241–246.

Fox, P. C., Busch, K. A., & Baum, B. J. (1987). Subjective reports of xerostomia and objective measures of Sjögren's syndrome performance. *Journal of the American Dental Association*, *15*(4), 581–584.

Johnson, J. T., Ferretti, G. A., Nethery, W. J., Valdez, I. H., Fox, P. C., Ng, D., et al. (1993). Oral pilocaroine for post-irradiation xerostomia in patients with head and neck cancer. *New England Journal of Medicine*, *329*(6), 390–395.

Pijpe, J., van Imhoff, G. W., Spijkervet, F. K., Roodenburg, J. L. N., Wolbink, G. J., Mansour, K., et al. (2005). Rituximab treatment in patients with primary Sjögren's syndrome: An open-label phase II study. *Arthritis & Rheumatism*, *52*(9), 2740–2750.

Schubert, M. M., & Izutsu, K. T. (1987). Iatrogenic causes of salivary gland dysfunction. *Journal of Dental Research*, *66*, Spec. No., 680–688.

Vitali, C., Bombardieri, S., Jonsson, R., Moutsopoulos, H. M., Alexander, E. L., Carsons, S. E., et al., & the European Study Group on Classification Criteria for Sjögren's Syndrome (2002). Classification criteria for Sjögren's syndrome: A revised version of the European criteria proposed by the American–European Consensus Group. *Annals of Rheumatic Disease*, *6*, 554–558.

AUTHOR INDEX

SUBJECT INDEX