HANDBOOK OF CLINICAL NUTRITION
AND AGING
Nutrition and Bone Health, edited by Michael F. Holick and Bess Dawson-Hughes, 2004

Diet and Human Immune Function, edited by David A. Hughes, L. Gail Darlington, and Adrianne Bendich, 2004


Fatty Acids: Physiological and Behavioral Functions, edited by David I. Mostofsky, Shlomo Yehuda, and Norman Salem, Jr., 2001

Nutrition and Health in Developing Countries, edited by Richard D. Semba and Martin W. Bloem, 2001


Primary and Secondary Preventive Nutrition, edited by Adrianne Bendich and Richard J. Deckelbaum, 2000


The Management of Eating Disorders and Obesity, edited by David J. Goldstein, 1999

Vitamin D: Physiology, Molecular Biology, and Clinical Applications, edited by Michael F. Holick, 1999

© 2004 Springer Science+Business Media New York

Originally published by Humana Press Inc. in 2004

Softcover reprint of the hardcover 1st edition 2004

www.humanapress.com

All rights reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, microfilming, recording, or otherwise without written permission from the Publisher.

The content and opinions expressed in this book are the sole work of the authors and editors, who have warranted due diligence in the creation and issuance of their work. The publisher, editors, and authors are not responsible for errors or omissions or for any consequences arising from the information or opinions presented in this book and make no warranty, express or implied, with respect to its contents.

Due diligence has been taken by the publishers, editors, and authors of this book to assure the accuracy of the information published and to describe generally accepted practices. The contributors herein have carefully checked to ensure that the drug selections and dosages set forth in this text are accurate and in accord with the standards accepted at the time of publication. Notwithstanding, since new research, changes in government regulations, and knowledge from clinical experience relating to drug therapy and drug reactions constantly occur, the reader is advised to check the product information provided by the manufacturer of each drug for any change in dosages or for additional warnings and contraindications. This is of utmost importance when the recommended drug herein is a new or infrequently used drug. It is the responsibility of the treating physician to determine dosages and treatment strategies for individual patients. Further, it is the responsibility of the health care provider to ascertain the Food and Drug Administration status of each drug or device used in their clinical practice. The publishers, editors, and authors are not responsible for errors or omissions or for any consequences from the application of the information presented in this book and make no warranty, express or implied, with respect to the contents in this publication.

This publication is printed on acid-free paper. ANSI Z39.48-1984 (American Standards Institute) Permanence of Paper for Printed Library Materials.

Production Editor: Jessica Jannicelli.
Cover design by Patricia F. Cleary.

Photocopy Authorization Policy:
Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Springer Science+Business Media, LLC., provided that the base fee of US $25.00 per copy is paid directly to the Copyright Clearance Center at 222 Rosewood Drive, Danvers, MA 01923. For those organizations that have been granted a photocopy license from the CCC, a separate system of payment has been arranged and is acceptable to Springer Science+Business Media, LLC. The fee code for users of the Transactional Reporting Service is [1-58829-055-7/04 $25.00].

ISBN 978-1-4757-5355-4

Library of Congress Cataloging-in-Publication Data

   p. ; cm. -- (Nutrition and health)
   Includes bibliographical references and index.
   DOI 10.1007/978-1-59259-391-0
1.  Aged--Diseases--Nutritional aspects--Handbooks, manuals, etc. 2.  Aged--Diseases--Diet therapy--Handbooks, manuals, etc. 3.  Nutrition disorders in old age--Handbooks, manuals, etc. 4.  Aged--Nutrition--Handbooks, manuals, etc.
RC952.5.H344 2003
615.8'54'0846--dc21

2003012862
Dedication

C. W. B. dedicates this book to her parents, Betty and Bud, in humble appreciation of their support, unconditional love, and life lessons about courage under fire.

C. S. R. dedicates this book to her husband Tim, and her children, Ivy and Ramsay, in gratitude for the support, love, and joy they give her each day.
Series Introduction

The overriding mission of the Nutrition and Health series of books is to provide health professionals with texts that are considered essential because each includes: (1) a synthesis of the state of the science; (2) timely, in-depth reviews by the leading researchers in their respective fields; (3) extensive, up-to-date fully annotated reference lists; (4) a detailed index; (5) relevant tables and figures; (6) identification of paradigm shifts and the consequences; (7) virtually no overlap of information between chapters, but targeted, interchapter referrals; (8) suggestions of areas for future research; and (9) balanced, data-driven answers to patient and/or health professionals’ questions that are based on the totality of evidence rather than the findings of any single study.

The series volumes are not the outcome of a symposium. Rather, each editor has the potential to examine a chosen area with a broad perspective, both in subject matter as well as in the choice of chapter authors. The international perspective, especially with regard to public health initiatives, is emphasized where appropriate. The editors, whose trainings are both research and practice oriented, have the opportunity to develop a primary objective for their book, define the scope and focus, and then invite the leading authorities from around the world to be part of their initiative. The authors are encouraged to provide an overview of the field, discuss their own research, and relate the research findings to potential human health consequences. Because each book is developed de novo, the chapters are coordinated so that the resulting volume imparts greater knowledge than the sum of the information contained in the individual chapters.

Handbook of Clinical Nutrition and Aging, edited by Connie Bales and Christine Ritchie, clearly exemplifies the goals of the Nutrition and Health series. In fact, this is the first book in the series to be designated a handbook because it is clearly the most comprehensive volume available concerning the role of clinical nutrition in preserving the health of the elderly—especially those suffering from chronic disease. As the editors and chapter authors remind the reader, the fastest growing population in the United States as well as globally is the oldest-old. This important text provides practical, data-driven options to enhance this at-risk population’s potential for optimal health and disease prevention with special emphasis on secondary disease prevention. The overarching goal of the editors is to provide fully referenced information to health professionals so they may enhance the nutritional welfare and overall health of older adults.

Bales and Ritchie have organized the volume into four major areas of focus: (1) epidemiological findings that point to significant trends in nutritional aspects of aging, (2) key fundamentals of geriatric nutrition, (3) the effects of aging on the senses and effects of chronic diseases of aging on overall patient health concerns that can be affected by nutrition—as well as nutrition’s potential to reduce disease progression, and (4) broad clinical topics that include all of the major organ systems of the body in health and in disease. Unique areas of focus include legal and ethical aspects of end-of-life care, extensive review of herbal and nutritionally based dietary supplements, hearing and
nutrition, and cardiac rehabilitation programs including exercise and nutritional guidance. Each chapter includes a discussion of the physiology of the condition, the effects of aging, chronic disease(s), pertinent drugs or other treatments, relevant treatment guidelines, and the consequences of malnutrition and/or dietary recommendations and/or supplemental sources of nutrients.

Handbook of Clinical Nutrition and Aging sets the benchmark for providing the most critical data on drug/nutrient interactions with specific emphasis on drugs that affect taste. This practical information is provided in extensive, well-organized tables that are now accessible in this valuable volume. Understanding the complexities of the aging process, drug use, physical debilities, and mental changes that also affect nutrient status certainly is no simple task; the standards used can often seem daunting. However, the authors are intent on assisting those unfamiliar with this field in understanding the critical issues and important new research findings that can impact their fields of interest. The editors have taken special care to use the same terms and abbreviations between chapters, and to provide clear reference to relevant material between chapters. Moreover, the Foreword by the well-acknowledged leader in the field, Dr. Robert Russell, provides a clear overview of the critical importance of this volume to the understanding of clinical nutrition and health of the aging population.

Drs. Bales and Ritchie have drawn from world renowned researchers to communicate the relevant role of clinical nutrition in the health of aging populations. The authors have worked hard to make their information accessible to health professionals who are interested in public health, geriatrics, nursing, pharmacy, and psychology, as well as nutrition-related health issues. The well-referenced tables and figures as well as the detailed references provide a great value to the reader. Many of the tables provide health professionals with guides to assessment in not only the nutritional status of the senior patient, but also help in evaluating activities of daily living, mental performance, multiple drug uses, and lists of other well-regarded resources. A very useful and unique component of virtually each chapter is a final section on “Recommendations for Clinicians.”

In conclusion, Handbook of Clinical Nutrition and Aging provides health professionals in many areas of research and practice with the most up-to-date, well-referenced, and easy-to-understand volume on the importance of nutrition for optimal health during the senior years. This volume will serve the reader as the most authoritative resource in the field of clinical nutrition and aging to date and is a very welcome addition to the Nutrition and Health series.

Adrienne Bendich, PhD, FACN
Series Editor
Handbook of Clinical Nutrition and Aging, edited by Connie Bales and Christine Ritchie, is a welcome addition to the Nutrition and Health series. The study of the role of nutrition in the aging process has indeed “come of age.” Public interest on this subject is at its highest peak—in hope that specific nutrients alone (or in combination) might play a role in the prevention of chronic diseases of aging, and indeed of aging itself. In this light, the Recommended Dietary Allowances (RDA) have been redefined according to a new paradigm: instead of an RDA representing how much of a nutrient it may take to protect a population against the deficiency state, it is now defined as how much of a nutrient it takes to prevent a chronic disease or metabolic disorder from occurring. For example, calcium and vitamin D requirements, in part, have been set according to the amounts needed to prevent bone demineralization and osteoporosis.

It is amazing what the last 20 years have brought forth with regard to our knowledge of nutrition in aging. We knew very little on this subject 20 years ago. We knew that underfed rats lived longer than ad libitum fed rats, and we knew that severe obesity had many dire health consequences—but that was about all. Over the last 20 years, the importance of calcium and vitamin D in bone health has been defined, the importance of B vitamins in cardiovascular disease has been demonstrated, and the roles that nutrients play in the prevention of other age-related diseases, such as hypertension, cancer, eye disease, and diabetes, have been better determined. But this continues to be a dynamic area of research, as we are learning more each day, not only about new biochemical mechanisms, but also the interplay between nutrients and the gene. Nutrients not only control certain aspects of gene expression, but genetic endowment controls the response to nutrients and diet that the individual is eating.

Twenty years ago it was thought that elderly people malabsorbed most nutrients. In fact, we now know that this is not true, and that some nutrients may be superabsorbed with age (e.g., vitamin A). One cannot generalize about nutrient needs in aging, e.g., that all nutrients are needed in more or less amounts. The need is very specific and individualized for each nutrient. For example, the need for vitamin D is greater with aging as a result of decreased skin synthesis with ultraviolet light exposure, whereas iron requirements are lower in postmenopausal women because of a loss of menstrual periods. Whereas it was thought that riboflavin requirements would be lower with aging owing to decreased energy expenditure, it has been shown that requirements for riboflavin are, in fact, steady throughout the aging process.

All practitioners have a need to communicate with their patients, and increasingly this requires a working knowledge of the role of nutrition in aging and age-related diseases. The Handbook of Clinical Nutrition and Aging is an up-to-date reference that provides (1) the trends in nutrition and health in older adults, (2) the fundamentals of geriatric nutrition, (3) geriatric syndromes related to nutrition (e.g., loss of taste, smell, and other senses), and (4) specific clinical topics that are intimately related to nutritional status.
(vascular disorders, pulmonary disease, cancer, musculoskeletal disorders, and so forth). Physicians who wish to take an active role in educating their patients in the prevention of chronic diseases associated with aging will find this book invaluable. Indeed, I hope *Handbook of Clinical Nutrition and Aging* will appear on the bookshelves, not only of medical libraries, but of a wide range of health practitioners.

*Robert M. Russell, MD*
*Tufts University, Boston, MA*
The “successful aging” strategies of the 20th century, along with the reduced birth rates in the United States and throughout much of the world, now bring us into the new millennium with a unique challenge. The “graying” of the world population is recognized as a major demographic trend that will bring dramatic change to the nature of many societies. In the United States, the current proportion of the population age 65 and older is 13%, an all-time high and up by 22% since 1980. This segment of the population is expected to increase to 20% by 2030. Most striking will be the increase in the proportion of “oldest-old”; the number of US citizens age 85 and older is projected to triple in this same time period. These trends are the same in many parts of the world. The global average life span has increased from 49.5 yr in 1972 to more than 63 yr currently. And the Third World, although still somewhat youthful, is aging more quickly than the rest of the world. This is particularly troublesome in view of the economic constraints in these countries; loss of workforce-age citizens will complicate the accommodations needed for elderly populations.

The aging of our world has important social, political, and economic implications for the future. But the most profound effect, from the standpoint of public health, will be the fundamental changes it brings in the medical profile of much of the world’s citizenry. Older adults have more complex health problems and use health care services at a greater rate than any other subgroup of the population. In the United States, older adults make an average of more than five outpatient physician visits annually and account for more than 38% of hospitalizations, although they constitute only 13% of the population. In addition, the elderly tend to spend more time in the hospital once admitted and are far more likely to be discharged to an intermediate care facility or nursing home than younger patients.

The importance of applying interventions to prevent or delay age-associated disease has never been more evident. The health concerns of older adults tend to be more serious and often occur in tandem with one or more other chronic conditions. Moreover, medical problems continue to escalate as individuals get older and result in “add-ons” for medical therapies. For example, 45% of older persons with diabetes mellitus were diagnosed at age 65 or later and 26% at or after age 75 yr. At age 75 and beyond, rates of use for five or more prescription drugs soar to 13.7% for men and 16.8% for women. These trends and the anticipated increase in numbers of elderly will almost certainly stress global medical and economic resources. We can expect increasing total health care expenditures, increased needs for long-term care services, and a demand for more focused health care services for older adults living at home as the mean age of the population continues to escalate.

The purpose of *Handbook of Clinical Nutrition and Aging* is to provide strategies for understanding and managing nutrition-related medical disorders in older adults. Good nutritional care will improve the short- and long-term courses of many illnesses that are common in older adults. Although primary prevention is the goal whenever possible, the foremost goal of this text is to provide expert advice on secondary prevention and offer
appropriate nutritional therapies for older adults with established health problems. We offer this handbook as a guide to health care workers (including physicians, nurses, and dietitians) who provide care for this high-risk population.

*Handbook of Clinical Nutrition and Aging* provides a comprehensive overview of disorders that can seriously affect and be affected by nutrition and, wherever possible, presents specific recommendations for secondary prevention, management, and therapy. It is organized into parts, each of which contain related information on health and diseases that are major determinants of morbidity and mortality in older and elderly adults. Each chapter presents a discussion of the physiological basis of the disorder or concern, with special emphasis on interactions with nutrition, and concludes with a section on practical application and treatment guidelines (wherever applicable). It is our hope that the nutritional welfare and overall health of older adults will be enhanced through the use of the information contained here.

*Connie Watkins Bales, PhD, RD, FACN*
*Christine Seel Ritchie, MD, MSPH*
Contents

Series Introduction ................................................................. vii
Foreword ......................................................................................... ix
Preface ......................................................................................... xi
Contributors ................................................................................... xv

I TRENDS IN NUTRITION AND HEALTH IN OLDER ADULTS

1 “Global Graying” and Nutritional Trends in the New Millennium:
   A Cross-Cultural Perspective ......................................................... 3
   Connie Watkins Bales and Yanfang Wang

2 Creating a Continuum of Nutrition Services
   for the Older Population ................................................................. 23
   Barbara E. Millen and C. Ariel Nason

3 The Progression from Physiological Aging to Disease:
   The Impact of Nutrition ................................................................. 49
   Roger B. McDonald and Rodney C. Ruhe

4 The Status of Nutrition in Older Adults:
   A European Perspective ................................................................. 63
   Lisette C. P. G. M. de Groot and Wija A. van Staveren

II FUNDAMENTALS OF GERIATRIC NUTRITION

5 Nutritional Assessment and Support in Chronic Disease
   Management ................................................................................... 77
   Margaret-Mary G. Wilson and John E. Morley

6 Common Nutrient Deficiencies in Older Adults ................................ 103
   Christopher J. Bates

7 Dietary Supplements for Health Maintenance and Risk Factor
   Reduction ..................................................................................... 127
   Rebecca B. Costello, Maureen Leser, and Paul M. Coates

III GERIATRIC SYNDROMES: NUTRITIONAL CONSEQUENCES AND POTENTIAL
   OPPORTUNITIES

8 Nutrition and the Aging Eye ........................................................... 193
   Elizabeth J. Johnson

9 Loss of Taste, Smell, and Other Senses with Age: Effects
   of Medication ................................................................................ 211
   Susan S. Schiffman, Mamie O. Rogers, and Jennifer Zervakis
Contents

10 Hearing Loss and Nutrition in Older Adults .......................................................... 291
   Mary Ann Johnson, Albert R. DeChicchis, James F. Willott,
   Kelly J. Shea-Miller, and Robert J. Nozza

11 Sarcopenia and Nutritional Frailty: Diagnosis and Intervention ..................................... 309
   Christine Seel Ritchie and Connie Watkins Bales

12 The Relationship of Nutrition and Pressure Ulcers ................................................... 335
   David R. Thomas

13 Dementia ........................................................................................................... 349
   Heidi K. White

14 Nutrition and End-of-Life Care ........................................................................... 367
   Christian Davis Furman and Christine Seel Ritchie

IV  CLINICAL TOPICS

A. VASCULAR DISORDERS

15 Vascular Function, Aging, and the Impact of Diet ........................................... 379
   Daniel E. Forman, Paula A. Quatromoni, and Giulia L. Sheftel

16 Nutritional Management of Hypertension in the Elderly ..................................... 399
   Pao-Hwa Lin, Marji McCullough, and Laura P. Svetkey

17 Cardiac Rehabilitation and Exercise .................................................................. 419
   Kent J. Adams

18 Chronic Heart Failure ....................................................................................... 437
   Michael W. Rich

B. PULMONARY DISEASES

19 Nutrition and Chronic Obstructive Pulmonary Disease .................................... 457
   Katherine Gray-Donald and Helga Saudny-Unterberger

C. CANCER

20 Nutritional Requirements Following Cancer Treatment/Surgery ....................... 477
   Selwyn M. Vickers and Peter A. Nagi

D. ENDOCRINE DISORDERS

21 Nutrition and Lifestyle Change in Older Adults with Diabetes Mellitus .................. 487
   Barbara Stetson and Sri Prakash Mokshagundam

22 Obesity in Middle and Older Age .................................................................... 517
   Gordon L. Jensen and Melanie Berg

E. ALIMENTARY TRACT DISORDERS

23 Oral Health and Nutrition ............................................................................. 533
   Christine Seel Ritchie and Kaumudi Joshipura
Dysphagia Evaluation, Treatment, and Recommendations ........................................ 547
Carol Smith Hammond, Candice Hudson Scharver, Lisa W. Markley, Judy Kinnally, Marianne Cable, Linda Evanko, and David Curtis

Gastrointestinal Senescence and Digestive Diseases of the Elderly ................................................................. 569
Gerald W. Dryden and Stephen A. McClave

Provision for Enteral and Parenteral Support ................................................................. 583
Mark H. DeLegge and David A. Sabol

F. RENAL DISORDERS

Nutrition in Chronic Renal Disease and Renal Failure ........................................ 599
Giuliano Brunori

G. MUSCULOSKELETAL DISORDERS

Osteoarthritis ........................................................................................................ 623
Timothy E. McAlindon

Nutritional and Pharmacological Aspects of Osteoporosis ........................................ 639
John J. B. Anderson and David A. Ontjes

H. INFECTIOUS DISEASES AND IMMUNITY

Aging and Immunity ................................................................................................. 657
Shirish Barve, Christine Seel Ritchie, and Craig J. McClain

Nutrition in Surgery, Trauma, and Sepsis ......................................................... 671
David A. Spain

Index ......................................................................................................................... 681
Contributors

KENT J. ADAMS, PhD, FACSM, CSCS • Exercise Physiology Laboratory, University of Louisville, Louisville, KY

JOHN J. B. ANDERSON, PhD • Department of Nutrition and Medicine, Schools of Public Health and Medicine, University of North Carolina, Chapel Hill, NC

CONNIE WATKINS BALES, PhD, RD, FACN • Geriatrics Research, Education and Clinical Center, Durham VA Medical Center and Division of Geriatric Medicine, Duke University Medical Center, Durham, NC

SHIRISH BARVE, PhD • Division of Gastroenterology/Hepatology, University of Louisville, Louisville, KY

CHRISTOPHER J. BATES, MA, DPhil • Medical Research Council, Human Nutrition Research, Cambridge, UK

MELANIE BERG, MS, RD, LDN • The Vanderbilt Center for Human Nutrition, Vanderbilt University Medical Center, Nashville, TN

GIULIANO BRUNORI, MD • Cattedra e Divisione di Nefrologia, Spedali Civili e Università degli Studi, Facoltà di Medicina e Chirurgia, Brescia, Italy

MARIANNE CABLE, RD • Audiology and Speech Pathology, Nutrition, and Radiology Services, Durham VA Medical Center, and Department of Medicine, Duke University Medical Center, Durham, NC

PAUL M. COATES, PhD • Office of Dietary Supplements, National Institutes of Health, Bethesda, MD

REBECCA B. COSTELLO, PhD • Office of Dietary Supplements, National Institutes of Health, Bethesda, MD

DAVID CURTIS, MD • Audiology and Speech Pathology, Nutrition, and Radiology Services, Durham VA Medical Center, and Department of Medicine, Duke University Medical Center, Durham, NC

ALBERT R. DECHICCHIS, PhD • Department of Communication Sciences and Disorders, College of Education, University of Georgia, Athens, GA

LISETTE C. P. G. M. DE GROOT, MSC, PhD • Division of Human Nutrition and Epidemiology, Department of Agrotechnology and Food Sciences, Wageningen University, Wageningen, The Netherlands

MARK H. DELLEGGGE, MD • Digestive Disease Center, Division of Gastroenterology, Medical University of South Carolina, Charleston, SC

GERALD W. DRYDEN, MD • Division of Gastroenterology/Hepatology, Department of Medicine, University of Louisville, Louisville, KY

LINDA EVANKO, RD • Audiology and Speech Pathology, Nutrition, and Radiology Services, Durham VA Medical Center, and Department of Medicine, Duke University Medical Center, Durham, NC

DANIEL E. FORMAN, MD • Section of Cardiology, Department of Medicine, Boston University School of Medicine, Boston, MA
CHRISTIAN DAVIS FURMAN, MD • Division of General Internal Medicine, Geriatrics and Health Policy Research, University of Louisville, Louisville, KY

KATHERINE GRAY-DONALD, PhD • School of Dietetics and Human Nutrition, McGill University, Montreal, Quebec, Canada

CAROL SMITH HAMMOND, PhD • Audiology and Speech Pathology, Nutrition, and Radiology Services, Durham VA Medical Center, and Department of Medicine, Duke University Medical Center, Durham, NC

GORDON L. JENSEN, PhD, MD • The Vanderbilt Center for Human Nutrition, Vanderbilt University Medical Center, Nashville, TN

ELIZABETH J. JOHNSON, PhD • Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, MA

MARY ANN JOHNSON, PhD • Department of Foods and Nutrition, Faculty of Gerontology, University of Georgia, Athens, GA

KAUMUDI JOSHIPURA, DDS, ScD • Department of Oral Health Policy and Epidemiology, Harvard School of Dental Medicine, and Department of Epidemiology, Harvard School of Public Health, Boston, MA

JUDY KINNALLY, MEd • Audiology and Speech Pathology, Durham VA Medical Center, Durham, NC

MAUREEN LESER, MS, RD • Office of Dietary Supplements, National Institutes of Health, Bethesda, MD

PAO-HWA LIN, PhD • Department of Medicine, Sarah W. Stedman Center for Nutritional Studies, Duke University Medical Center, Durham, NC

LISA W. MARKLEY, MS • Audiology and Speech Pathology, Durham VA Medical Center, Durham, NC

TIMOTHY E. McALINDON, MD, MPH • Division of Rheumatology, Tufts-New England Medical Center, Boston, MA

CRAIG J. McCLAIN, MD • Division of Gastroenterology, Department of Medicine, University of Louisville, Louisville, KY

STEPHEN A. McCLAVE, MD • Division of Gastroenterology, University of Louisville, Louisville, KY

MARJ McCULLOUGH, ScD, RD • American Cancer Society, Atlanta, GA

ROGER B. MCDONALD, PhD, MD • Department of Nutrition, University of California, Davis, CA

BARBARA E. MILLEN, DrPH, RD, FADA • Department of Social and Behavioral Sciences and Sociomedical Sciences, Boston University Schools of Medicine and Public Health, Boston, MA

SRI PRAKASH MOKSHAGUNDAM, MD • Division of Endocrinology, Department of Medicine, University of Louisville, Louisville, KY

JOHN E. MORLEY, MB, BCh • Division of Geriatric Medicine, St. Louis University Health Sciences Center, St. Louis, MO

PETER A. NAGI, MD • Division of Gastrointestinal Surgery, UAB School of Medicine, University of Alabama at Birmingham Medical Center, Birmingham, AL

C. ARIEL NASON, MA • Boston University School of Medicine, Boston, MA

ROBERT J. NOZZA, PhD • Section of Audiology, Temple University School of Medicine, Philadelphia, PA

DAVID A. ONTIES, MD • Department of Medicine, School of Medicine, University of North Carolina, Chapel Hill, NC

PAULA A. QUATROMONI, DSc, RD • Department of Health Sciences, Sargent College of Health and Rehabilitation Sciences, Boston University, Boston, MA
MICHAEL W. RICH, MD • Cardiovascular Division, Washington University School of Medicine, St. Louis, MO
CHRISTINE SEEL RITCHIE, MD, MSPH • Louisville VA Medical Center, Division of General Internal Medicine, Geriatrics and Health Policy Research, Department of Medicine, University of Louisville, Louisville, KY
MAMIE O. ROGERS • Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC
RODNEY C. RUHE, PhD • Department of Nutrition, University of California, Davis, CA
ROBERT M. RUSSELL, MD • Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA
DAVID A. SABOL, MD • Digestive Disease Center, Division of Gastroenterology, Medical University of South Carolina, Charleston, SC
HELGA SAUNDY-UNTERBERGER, MSc • School of Dietetics and Human Nutrition, McGill University, Montreal, Quebec, Canada
CANDICE HUDSON SCHARVER, MA • Audiology and Speech Pathology, Durham VA Medical Center, Durham, NC
SUSAN S. SCHIFFMAN, PhD • Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC
KELLY J. SHEA-MILLER, PhD • School of Graduate Medical Education, Seton Hall University, South Orange, NJ
GIULIA L. SHEFTEL, MD • Section of Cardiology, Department of Medicine, Boston University School of Medicine, Boston, MA
DAVID A. SPAIN, MD • Department of Surgery, Stanford University School of Medicine, Stanford, CA
BARBARA STETSON, PhD • Department of Psychological and Brain Sciences, University of Louisville, Louisville, KY
LAURA P. SVETKEY, MD • Duke Hypertension Center, Department of Medicine, and Sarah W. Stedman Center for Nutritional Studies, Duke University Medical Center, Durham, NC
WIA A. VAN STAVEREN, MSc, RD, PhD • Division of Human Nutrition and Epidemiology, Department of Agrotechnology and Food Sciences, Wageningen University, Wageningen, The Netherlands
DAVID R. THOMAS, MD, FACP, FAGS • Division of Geriatric Medicine, St. Louis University Health Sciences Center, St. Louis, MO
SELWYN M. VICKERS, MD • Division of Gastrointestinal Surgery, UAB School of Medicine, University of Alabama at Birmingham Medical Center, Birmingham, AL
YANFANG WANG, PhD, MD • Geriatrics Research, Education and Clinical Center, Durham VA Medical Center and for the Study of Aging and Human Development, Duke University Medical Center, Durham, NC
HEIDI K. WHITE, MD • Division of Geriatric Medicine, Department of Medicine, Center for the Study of Aging and Human Development, Duke University Medical Center; and Geriatrics Research, Education and Clinical Center, Durham VA Medical Center, Durham, NC
JAMES F. WILLOTT, PhD • Department of Psychology, University of South Florida, Tampa, FL
MARGARET-MARY G. WILSON, MB, BS • Division of Geriatric Medicine, St. Louis University Health Sciences Center, St. Louis, MO
JENNIFER ZERVAKIS, PhD • Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC