

Nutrition and Health

*Series Editors: Adrienne Bendich · Connie W. Bales*

Ted Wilson

Norman J. Temple

George A. Bray *Editors*

# Nutrition Guide for Physicians and Related Healthcare Professions

*Third Edition*

 Humana Press

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# **Nutrition and Health**

## **Series Editors**

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

Nutrition and Health is a major resource of relevant, clinically based nutrition volumes for the professional that serve as a reliable source of data-driven reviews and practice guidelines.


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Ted Wilson • Norman J. Temple • George A. Bray  
Editors

# Nutrition Guide for Physicians and Related Healthcare Professions

Third Edition

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ISBN 978-3-030-82514-0

ISBN 978-3-030-82515-7 (eBook)

<https://doi.org/10.1007/978-3-030-82515-7>

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This Humana imprint is published by the registered company Springer Nature Switzerland AG  
The registered company address is: Gewerbstrasse 11, 6330 Cham, Switzerland

*To my Dad, my boy Jack, brown trout, and the Big Horn  
River in Montana*

*Ted Wilson*

*To Evie, my adorable granddaughter*

*Norman Temple*

*To my wife, Mitzi, who has been a loving companion for  
over 40 years.*

*George Bray*

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## Preface

It has often been pointed out that there is a near absence of nutrition education during medical school [1]. If this deficiency is corrected during postgraduate medical training, it often owes more to accident than design, or to the personal interests of individual physicians. As a result most physicians have gaping holes in their knowledge of nutrition [2, 3]. This book is intended to help correct this deficiency.

A great many advances in our understanding of nutrition took place during the twentieth century. In the first half of the century the focus was largely on vitamins and minerals. Since the 1970s there has been a flood of research studies on the role of diet in such chronic diseases as heart disease and cancer. Today, we have a vastly greater understanding of the role of diet in causing various chronic diseases of lifestyle. This evidence convincingly demonstrates that nutrition serves as an essential weapon for physicians in the battle against disease and for the enhancement of human health. We know, for example, that the risk of developing cancer, heart disease, obesity, and type 2 diabetes is affected by such foods as whole grain cereals, fruits, vegetables, the kinds of meats that are eaten, and the beverages consumed.

We can point to a great many examples of how dietary change can have a profound effect on health, especially for the risk of chronic diseases. Here is one example. Poland went through a severe economic and political crisis during the 1980s and into the 1990s. One of the results of this was a sharp decrease in the availability of meat and other foods of animal origin. At the same time there was an increase in consumption of fruits and vegetables and a decrease in smoking. This was followed by a 40% drop in mortality from coronary disease during the period 1990–2002 [4]. Nevertheless, there are still many gaps in our knowledge in the area of nutrition and health. For example, we cannot properly explain why taking a vitamin supplement pill seldom delivers the expected health benefits.

To paraphrase Churchill, advances in the field of nutrition science in recent years represent “not the beginning of the end but, perhaps, the end of the beginning.” In the opinion of the editors, we are ready to help physicians and other healthcare professionals move their patients from the hors d’oeuvres to the main course.

Cultural change at a global, national, and regional level means that our nutrition habits and our interpretation of them will change as time marches on. As George Bernard Shaw said: “Everything I eat has been proved by some doctor or other to be a deadly poison, and everything I don’t eat has been proved to be indispensable for life. But I go marching on.” His comments are a reflection of the continued confusion in the public and among health professionals about what to eat and how much to eat. A simple walk through the self-help section of a book store will confirm the existence of many differing opinions of what “preventative nutrition” is all about, some verging on quackery and others built upon solid facts. Physicians and other healthcare professionals need the best possible interpretation of nutrition so that they are empowered to provide accurate advice to their clients.

In the words of Confucius: “The essence of knowledge is that, having acquired it, one must apply it.” But, ironically, despite overwhelming evidence that nutrition has such enormous potential to improve human well-being – at modest cost – there is still a chasm between nutrition knowledge and its full exploitation for human betterment. There is also an important chasm between evaluating the

strength of the supporting science and understanding its true meaning. Once the true meaning of nutrition is understood, the next hurdle is to bring dietary change to the public and the healthcare professionals who provide healthcare to the public.

As gatekeepers to the nutritional health of their patients, it is important that healthcare professionals have access to up-to-date nutrition resources – such as this handbook – as well as the nutrition expertise of registered dietitians. *Nutrition Guide for Physicians and Related Healthcare Professionals* endeavors to address the needs of those who would most benefit from up-to-date information on recent advances in the field of nutrition. Accordingly, our book contains chapters by experts in a diverse range of nutritional areas. Our aim is to present a succinct overview of recent thinking and discoveries that have the greatest capacity to aid physicians and other healthcare professionals in improving the nutritional health of their clients.

The structure of the book is as follows:

- After the Introduction (Part 1) the following seven chapters (Part 2) address the nutrient requirements and special nutrition-related issues for people across all stages of the lifespan – from pregnancy and infancy through the adolescent years to the older adult years.
- Chapters 9, 10, 11, 12, 13 and 14 (Part 3) summarize the role of nutrition in the prevention and management of chronic conditions frequently seen in clinical practice, including obesity, diabetes, bone disorders, coronary heart disease, hypertension, and cancer.
- This is followed by Chapters 15, 16, 17 and 18 (Part 4) that describe different dietary patterns (the Mediterranean diet, the DASH diet, the vegetarian diet, and the ketogenic diet).
- Chapters 19, 20, 21, 22, 23, 24, 25 and 26 (Part 5) describe nutrition challenges specific to surgery and several different acute diseases and disorders (gastrointestinal disorders, food allergy and intolerance, diseases of the liver and pancreas, kidney disease, eating disorders, bariatric surgery, sarcopenia, and drug interactions with food).
- After this comes Chapters 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 (Part 6) which look at different aspects of the diet (coffee, tea, dietary fat, dietary sugars, energy drinks, alcohol, dietary fiber, vitamins, minerals, and the gut microbiome).
- Chapters 37, 38, 39, 40 and 41 (Part 7) examine a range of factors that influence dietary health decisions (creating nutritional behavior change, methods for assessing nutritional status, Dietary Reference Intakes, an overview of the diet and food guides, food labels, and sources of nutrients).
- Chapters 42 and 43 (Part 8) look at dietary supplements (including the problem of dishonest marketing) and false and misleading information in the area of nutrition.
- Chapter 44 (Part 9) shares final thoughts about why clinical nutrition has been, is, and will continue to be ever evolving.

Some readers may disagree with particular opinions presented by the authors, but in nutrition differences of opinion are often unavoidable because nutrition is an ever-changing science that lives and breathes debate and controversy. Readers are also reminded that nutrition is a fast evolving science. Many ideas regarding nutrition that are widely accepted today may be discredited in coming years. The following two quotes illustrate our changing understanding of what constitutes nutritional and medical wisdom.

The role of nutrition for creating optimal health has remained well known for millennia. An ancient Chinese proverb says: “He that takes medicine and neglects diet, wastes the skills of the physician” and the Greek physician Hippocrates noted: “Let food be thy medicine, and let medicine be thy food”. If we had the wisdom to know “what” to eat.

It was not so long ago that vegetarians were seen as annoyingly esoteric. Here is what George Orwell had to say on this in *The Road to Wigan Pier*, written in 1936:



I have here a prospectus [from a socialist summer school] which... asks me to say ‘whether my diet is ordinary or vegetarian’. They take it for granted, you see, that it is necessary to ask this question. This kind of thing is by itself sufficient to alienate plenty of decent people. And their instinct is perfectly sound, for the food-crank is by definition a person willing to cut himself off from human society in hopes of adding five years on to the life of his carcass; this is, a person out of touch with the common humanity.

Drummond and Wilbraham published a seminal book entitled *The Englishman’s Food* in 1939. Jack Drummond was a major nutrition authority in the 1920s and 1930s. It would be foolhardy to believe that we can be any more accurate today in our predictions than they were over 70 years ago.

So much precise research has been done in the laboratory and so many precise surveys have been made that we know all we need to know about the food requirements of the people....The position is perfectly clear-cut [with respect to Britain]. The role of nutrition for creating optimal health has remained well known for millennia. An ancient Chinese proverb says: “He that takes medicine and neglects diet, wastes the skills of the physician” and the Greek physician Hippocrates noted: “Let food be thy medicine, and let medicine be thy food”. If we had the wisdom to know “what” to eat.

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## Series Editor Pages

The great success of the Nutrition and Health Series is the result of the consistent overriding mission of providing health professionals with texts that are essential because each includes: (1) a synthesis of the state of the science, (2) timely, in-depth reviews by the leading researchers and clinicians in their respective fields, (3) extensive, up-to-date fully annotated reference lists, (4) a detailed index, (5) comprehensive tables and figures, (6) identification of paradigm shifts and the consequences, (7) virtually no overlap of information between chapters, but targeted, inter-chapter referrals, (8) suggestions of areas for future research, and (9) balanced, data-driven answers to patient as well as health professionals questions which are based upon 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 and 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.

As we are all aware, 2020 and 2021 have been the years of COVID. For all of us.

It has taken much greater effort to do everything that we could normally accomplish in the required time. We have often failed to meet anything but first, family-related priority deadlines and have not accepted any requests for book chapters, etc. *Nutrition Guide for Physicians and Related Healthcare Professionals, Third Edition*, edited by Ted Wilson, Norman J. Temple, and George A. Bray is not only a very welcome addition to the Nutrition and Health Series, but it is simply extraordinary that the editors were able to enlist over 100 authors to contribute the new, updated and excellent 44 chapters for this highly anticipated third edition during these two COVID years. Moreover, many of the most COVID-relevant chapters include addenda, and in total, more than 50 COVID-specific references have been added to the 1000+ references in this valuable text.

The present volume represents a critical updating of the chapters and topics that were so well received when the first edition was published in 2010 and the second edition in 2010. This timely volume also includes current topics that have moved to the forefront of clinical nutrition importance including, where relevant, the findings from peer-reviewed journals concerning COVID and nutrition. This volume will remain an important resource for physicians in many clinical fields who see patients of all ages, nutritionists and dietitians, research and public health scientists, and related health professionals who interact with clients, patients, and/or family members. This volume provides timely objective, relevant information for professors and lecturers, advanced undergraduates and graduates, researchers and clinical investigators who require extensive, up-to-date literature reviews, instructive

tables and figures, and excellent references on all aspects of the role of nutrition in human health and disease. This volume is especially relevant as the number of research papers and meta-analyses in the clinical nutrition arena increases every year and clients and patients are very much interested in dietary components for disease prevention. Nutrition research is presented to the lay public daily on numerous websites and podcasts, and the COVID pandemic has heightened the awareness of the public to the critical link of obesity and the adverse effects of COVID infection, as but one example. Certainly, the obesity epidemic has been associated with significantly increased infection morbidity and mortality in all age groups and racial and ethnic groups as well. The major obesity comorbidities, such as the metabolic syndrome, Type 2 diabetes, hypertension, and hyperlipidemia, often seen in seniors and even in young children, clearly further increase COVID infection risks. The editors have made great efforts to provide health professionals with the most up-to-date and comprehensive volume that highlights the key references and discussions concerning COVID and nutrition that were available. As many of the chapters had been completed before the most recent research papers were published, the new information related to COVID has been added, with references, at the end of the relevant chapters.

The editors have combined their broad backgrounds in research as well as clinical practice to help the reader better understand the relevant science without the details of complex discussions of in vitro and laboratory animal studies. **Ted Wilson, Ph.D.**, is Professor of Biology at Winona State University in Winona, Minnesota. His research examines how diet affects human nutritional physiology and whether food/dietary supplement health claims can be supported by measurable physiological changes. He has studied many foods, dietary supplements, and disease conditions including pistachios, low-carbohydrate diets, walnuts, cranberries, cranberry juice, apple juice, grape juice, wine, resveratrol, creatine phosphate, soy phytoestrogens, eggplants, coffee, tea, energy drinks, heart failure prognosis, diabetes, and obesity. Diet-induced changes have included physiological evaluations of plasma lipid profile, antioxidants, vasodilation, nitric oxide, platelet aggregation, and glycemic and insulinemic responses using in vivo and in vitro models. He also enjoys teaching courses in Nutrition, Physiology, Cardiovascular Physiology, Cell Signal Transduction, and Cell Biology. **Norman J. Temple, Ph.D.**, is Professor of Nutrition at Athabasca University in Alberta, Canada. He has published 95 papers, mainly in the area of nutrition in relation to health. He has also published 14 books. Together with Denis Burkitt he coedited *Western Diseases: Their Dietary Prevention and Reversibility* (1994). This continued and extended Burkitt's pioneering work on the role of dietary fiber in chronic diseases of lifestyle. Since 2001, he has coedited six volumes in the Nutrition and Health Series including *Nutritional Health: Strategies for Disease Prevention* edited by Ted Wilson and Norman J. Temple; *Beverage Impacts on Health and Nutrition* edited by Ted Wilson and Norman J. Temple; *Nutritional Health: Strategies for Disease Prevention, Second Edition*, edited by Norman J. Temple, Ted Wilson, and David R. Jacobs; *Nutrition Guide for Physicians* edited by Ted Wilson, Norman J. Temple, George A. Bray, and Marie Boyle Struble and published in 2010; *Nutritional Health: Strategies for Disease Prevention, Third Edition*, edited by Norman J. Temple, Ted Wilson, and David R. Jacobs and published in 2012; and *Beverage Impacts on Health and Nutrition, Second Edition*, edited by Ted Wilson and Norman J. Temple. He conducts collaborative research in Cape Town on the role of the changing diet in South Africa on the pattern of diseases in that country, such as obesity, diabetes, and heart disease. **George A. Bray, M.D., M.A.C.P., M.A.C.E.**, is Boyd Professor Emeritus at the Pennington Biomedical Research Center of Louisiana State University in Baton Rouge, Louisiana, and Professor of Medicine Emeritus at the Louisiana State University Medical Center in New Orleans. After graduating from Brown University summa cum laude, he entered Harvard Medical School graduating magna cum laude. His postdoctoral training included an internship at the Johns Hopkins Hospital, Baltimore, MD, a fellowship at the NIH, residency at the University of Rochester, and a fellowship at the National Institute for Medical Research in London and at the Tufts-New England Medical Center in Boston. He served as Director of the Clinical Research Center at the

Harbor UCLA Medical Center in Torrance, CA. He organized the First Fogarty International Center Conference on Obesity in 1973 and the Second International Congress on Obesity in Washington DC in 1977. In 1989 he became the first Executive Director of the Pennington Biomedical Research Center in Baton Rouge, a post he held until 1999. He is a Master of the American College of Physicians, Master of the American College of Endocrinology, and Master of the American Board of Obesity Medicine. Bray founded the North American Association for the Study of Obesity in 1982 (now the Obesity Society), and he was the founding editor of its journal, *Obesity Research*, as well as co-founder of the *International Journal of Obesity* and the first editor of *Endocrine Practice*, the official journal of the American Association of Clinical Endocrinology. Dr. Bray has received many awards during his medical career including the Johns Hopkins Society of Scholars, Honorary Fellow of the American Dietetic Association, the Bristol–Myers Squibb Mead–Johnson Award in Nutrition, the Joseph Goldberger Award from the American Medical Association, the McCollum Award from the American Society of Clinical Nutrition, the Osborne–Mendel Award from the American Society of Nutrition, the TOPS Award, the Weight Watchers Award, the Stunkard Lifetime Achievement Award, the Presidential Medal from the Obesity Society, and in 2019 the W.O. Atwater Award from the USDA and American Society for Nutrition. During his 50 academic years Bray authored or coauthored more than 2,000 publications, ranging from peer-reviewed articles and reviews to books, book chapters, and abstracts reflected in his Hirsch (H) Index of 134. Dr. Bray is the coeditor of the three editions of *Nutrition Guide for Physicians and Related Healthcare Professionals*, and has had a long interest in the history of medicine and has written articles and a book on the history of obesity.

This text is organized so that each chapter includes clear definitions of medical terms and distinctions are made concerning commonly asked patient questions such as what are the differences between the types of fats and their negative and positive health aspects. An excellent explanation concerning the possible reason for disparity between study findings is provided in the posing of insightful questions such as: Were all serum measurements made within hours or weeks following dietary changes? Definitions are provided for the numerous types of vegetable-based diets that are often discussed with health professionals.

Unique to this volume are the in-depth chapters that explain the development of the dietary recommendations and how these are translated into information on food labels. Chapters concerning the growing interest in organic foods and food safety are included. There is an extensive analysis of the recommendations by nations on the contents of a healthy diet and suggestions for physicians and other health professionals in helping patients reach the goal of understanding the value of consuming a healthy diet. A separate chapter reviews the importance of certain dietary supplements as well as separate chapters that review the essential vitamins and essential minerals. This volume includes 44 review chapters that contain Key Points and Key Words as well as over 1,200 targeted references, over 80 useful tables and figures, and a listing of recommended readings. In addition the volume contains an extensive index and helpful Appendices. The volume chapters are organized in nine parts that enhance the reader's ability to identify the areas most relevant for their needs. All chapters are available online and are downloadable as is the entire volume.

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## Part One: Introduction

The editors have provided readers with a broad overview of their objectives and vision for this important volume and provide their perspectives concerning the importance of assessing the nutritional status of patients during the COVID pandemic.

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## Part Two: Nutritional Considerations Across the Lifespan

The seven chapters provide readers with the basics of nutritional requirements during pregnancy, lactation, weaning and early infant transition to solid foods, childhood nutrition, adolescent nutrition, unique needs of the menstruating female, and a new chapter concerned with dietary factors that are particularly important during the menopausal transition, and there is a separate chapter that examines the critical role of nutrition in supporting healthy aging. The chapters describe investigations into the mechanisms and factors affecting nutrient metabolism and the changes that occur at each life stage. Chapter 2 begins with a description of the preparations for pregnancy and reviews the periconceptional need for folic acid and other micronutrients as well as the importance of weight control. Descriptions of the nutritional and immunological value of breast milk are included in Chap. 3 as is a discussion of the importance of protein, essential micronutrients, and balanced consumption of the other macro- and micronutrients during childhood growth and during pregnancy, and as of March 2021, breast feeding continues to be recommended for COVID-infected mothers. Reviews of the major clinical studies and national guidelines for each age and life stage are included. The chapter on adolescence and young adults examines the development of eating disorders including obesity, anorexia, bulimia, and binge eating. Chapter 7 reviews the unique nutritional needs in older adults. The significant impacts of COVID on this population, including a sensitive analysis of the devastating effects of COVID in the nursing home patient population that often includes the oldest patients, as well as home-bound seniors living alone and whose diets are often compromised, are reviewed and relevant references are included. Healthy eating is particularly relevant to menopausal women described in Chap. 8. The effects of stress levels on weight maintenance in this population as well as the biological and mental effects of growing older are discussed. The findings of increased weight gain and additional stress associated with reduced access to fresh fruits and vegetables (as examples) and many types of exercise programs during the COVID pandemic are examined in the chapter's addendum.

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## Part Three: Nutrition for the Prevention and Management of Chronic Conditions

Part Three contains six chapters that examine the critical issues of weight management and consequences including eating disorders, obesity, and diabetes. Chapters examine the effects of obesity and its comorbidities including insulin resistance, cardiovascular complications, lipid disorders, hypertension, and hormonal imbalances. Chapter 9 includes in-depth discussions of classification of obesity stages, adverse health effects, and types of treatments including diets, drugs, and surgeries. The tables are especially informative. At the end of Chap. 9, there are statistics related to the serious adverse effects of obesity on the morbidity of COVID infection and related, significantly increased risk of mortality as BMI increases in this population. Chapter 10 provides a detailed review of the many aspects of medical nutrition therapy that are critical to maintaining the health of diabetics and includes the recent findings of increased morbidity risk from COVID in both Type 1 and Type 2 diabetes patients. Practice guidelines and tools for obesity management including up-to-date information surgical obesity treatments and their implications for improving human health and reducing obesity-related diseases are tabulated for the reader in the next chapter. The chapter on bone health reviews the critical nutrients necessary to build and maintain strong bones throughout the lifespan. The chapters on coronary heart disease and blood pressure contain valuable information about salt intake, plant stanols and sterols, homocysteine, and antioxidants and review the major clinical trials that showed the power of diet to beneficially affect cardiovascular outcomes: the DASH study (which is examined in depth in a separate chapter) and the Trial of Hypertension Prevention are but two examples. The

new chapter concerning diet, physical activity, and cancer prevention integrates our current knowledge of the intertwined effects of these factors on reducing the risk of major cancers.

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## **Part Four: Dietary Patterns**

There are four new chapters in this part that are included as the role of whole diets and dietary patterns is becoming a focus of not only clinical nutrition but public health nutrition research. Separate chapters review the details of and research findings associated with the Mediterranean Diet, the DASH diet, vegetarian and flexitarian diets, and ketogenic diets. These chapters are of particular value to healthcare providers, especially dietitians, as many clients are confused by the details of these plans and how they may benefit from these programs. Detailed tables in these chapters provide further guidance.

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## **Part Five: Nutritional Requirements Following Surgery and Acute Disease**

There are eight chapters in this part and the first chapter reviews the often increased nutrient requirements seen in mainly adult patients dealing with inflammatory and/or infectious diseases in the gastrointestinal tract, including malabsorption diseases, GERD, ulcers, constipation, diarrhea, and diverticulosis. Many GI tract issues in children and young adults are linked to food allergies or food intolerance and these topics are examined in the next chapter. The following chapter looks at nutritional needs in patients with diseases of the liver and the pancreas; discussions of cirrhosis, nonalcoholic fatty liver disease, and acute as well as chronic diseases including cancers of these organ systems are included. Chapter 22 reviews the anatomy and physiology of renal function, and its critical role in fluid balance. Because of the interplay of cardiovascular disease, diabetes, and often resultant kidney disease, the chapter emphasizes the value of a specialist medical nutrition dietitian for patients with kidney diseases and comments on the increased risk of kidney disease development in COVID patients as well as renal patients being at increased risk for serious adverse effects if they are infected with COVID. The new chapter, Chap. 23 is new to this volume and importantly examines the effects of many of the most common eating disorders on the patient's nutritional status and provides guidance on medical nutrition diet modification programs as well as cognitive behavioral therapy and pharmaceutical drug use. The addendum alerts us to the finding of increased risk of eating disorders during the COVID pandemic and potentially, its aftermath. Another new chapter provides the latest data concerning the effects of bariatric surgery on the nutritional status of the patient before, immediately after, and following recovery. The specific essential nutrient requirements that are altered by certain types of this surgery are clearly reviewed. The third new chapter in this part examines the critical importance of protein in the diet of the elderly who are losing muscle mass (sarcopenia) and the equal importance of targeted exercise programs. As all of these patient populations often use one or more prescription drugs/day, the last chapter in this part reviews the most common drug-nutrient/food interactions and includes two comprehensive tables of drug–nutrient interactions.

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## **Part Six: Food and Nutrient Health Effects**

The ten chapters in this part review the major areas of patient questions concerning foods and beverages they consume as well as food components, including fat, fiber, vitamins and minerals. Six of the ten chapters in this part are new, including the first two chapters; the first chapter examines the data on coffee consumption and potential health benefits and the second chapter looks at the research to

determine the health benefits associated with consuming either black or green tea. Fats are reviewed in the next chapter including all of the types of dietary fats that are found in both meat and vegetable-based diets. As with fats, sugar sources often confuse patients and the advent of many artificial sweeteners adds to further confusion. This chapter discusses these topics as well as the health effects of added versus naturally occurring sugars within whole foods. Fiber also has its own chapter and examines their many sources, functions, and the types including those found in supplements. Energy drinks are a relatively new and growing category of high caffeine-containing beverages and a new chapter is devoted to this topic that includes relevant safety issues. Chapter 32 reviews the types of alcoholic beverages, measures of alcoholic beverage consumption, and the potential health benefits and risks and discusses the increase in alcohol consumption during the lockdowns associated with the COVID pandemic. The benefits and risks associated with vegetarian as well as vegan diets are reviewed. The last chapter in this part looks at the questions of food safety and quality and emphasizes the importance of understanding the meaning of organic when used to describe different types of foods. The separate chapters on vitamins and minerals (Chaps. 34 and 35) are comprehensive and provide helpful references including addendums concerning recent evidence of roles related to COVID. The last chapter, which is new to this volume, provides a broad overview of the role of the gut microbiome in overall health. The terms prebiotics and probiotics are defined and their usefulness is described as well as the value of providing microbes to the gut from foods/supplements. There are several comprehensive tables found in these chapters including the in-depth tables concerning vitamins and minerals.

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## **Part Seven: Influencing Dietary Health Decisions**

The five chapters in this part provide guidance to the health professional on diverse topics that affect client/patient health. The first chapter provides an in-depth examination of the value of behavioral change programs especially during weight reduction. The second chapter explains the methods used to assess nutritional intakes to help in defining the nutritional status of the patient. With the advent of COVID, nutritional assessments could no longer be performed face-to-face; recent suggestions for using telemedicine for assessments are cited in the addendum of Chap. 38. It is equally important that the health provider have a nutrition-based standard to share with the client that indicates the best dietary intake recommendations. The next chapter describes the US Dietary Reference Intakes and how these apply to the client/patient. The chapter provides clear guidance and also includes helpful references. Of great importance to the consumer, there is an informative chapter devoted to explaining each part of the food label and its new updated format, discusses the front of the label as well as the back including the nutrition facts box, and also reviews the health claims that are approved for use on the front label. The last chapter provides an historical view of the development of recommendations from single nutrients to the importance of whole foods and building diets around foods and not their components.

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## **Part Eight: Opinions Concerning Supplements**

The last two chapters provide the opinions of Dr. Temple and present the reader with examples of how to identify non-FDA approved claims as well as non-FDA approved ingredients mainly found in pill form and often sold in health food stores, health provider offices, and sold by mail.

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## Appendices

The volume includes two helpful appendices that include a table of aids for calculating nutritionally related concentrations and a list of books and websites that contain reliable nutrition and diet information.

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## Conclusions

Drs Wilson, Temple, and Bray are internationally recognized leaders in the fields of human nutrition including obesity research and clinical outcomes. These editors are proven excellent communicators, and they have worked tirelessly to develop this volume that is destined to become the benchmark in the field because of its extensive compilation of relevant topics covering the most important aspects of clinical nutrition. The titles of the chapters speak to their importance to clients, patients, as well as consumers interested in how nutrition affects their health. As well, the volume includes the latest research on the complex interactions between diet, health, and disease and includes recent findings linking many of the chapter topics with risk of contracting COVID as well as descriptions of the nutritional effects seen in COVID patients. The editors have chosen 70 of the most well-recognized and respected authors from around the world to contribute the 44 informative chapters in the volume. Hallmarks of all of the chapters include complete definitions of terms with the abbreviations fully defined for the reader and consistent use of terms between chapters. Key features of this comprehensive volume include the informative Key Points and Key Words that are at the beginning of each chapter and suggested readings as well as bibliography at the end of each chapter. The editors have added useful appendices including a detailed table of major conversions used in nutrient calculations. The volume also contains more than 80 detailed tables and figures, an extensive, detailed index, and more than 1,200 up-to-date references that provide the reader with excellent sources of worthwhile information about the role of diet, nutrition and exercise, food intake, nutritional value of foods, human physiology, and pathophysiology of the diet-related morbidities and comorbidities.

In conclusion, *Nutrition Guide for Physicians, Third Edition*, edited by Ted Wilson, Ph.D., Norman J. Temple, Ph.D., and George A. Bray, M.D., provides health professionals in many areas of research and practice with the most up-to-date, organized volume on well-accepted, data-driven nutrition topics that are often discussed by patients with their health provider. This volume serves the reader as the benchmark in this complex area of interrelationships between food and body weight, diet and health, and the role of national organizations in setting recommendations on dietary intakes. Moreover, the interactions between obesity, genetic factors, and the numerous comorbidities are clearly delineated so that practitioners can better understand the complexities of these interactions. Wherever possible, relevant information concerning COVID infection and the nutritional implications for the patient have been included. The editors are applauded for their efforts to develop this volume during this time of COVID with their firm conviction that “nutrition serves as an essential weapon for all doctors in the battle against disease and for the enhancement of human health.” This excellent text is a very welcome addition to the Nutrition and Health Series.

Adrienne Bendich, Ph.D., FACN, FASN



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## Acknowledgments

We, the editors, Ted Wilson, Norman J. Temple, and George A. Bray, wish to thank our series editor, Dr. Adrienne Bendich. We appreciate her enthusiastic support going back to the first edition of the present book that was published in 2010, as well as our five other books. Thanks for your strong support and for the countless times you have shared your insights with us. We also applaud her outstanding work in supporting the dozens of other books in the *Nutrition and Health Series*.

We also thank Stephanie Frost, Daniel Dominguez, Samantha Lonuzzi, and Jessica Gonzalez, our developmental editors at Springer in New York, who helped with the morass of details needed to get this book published. We value their skilled work.

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## About the Volume Editors



**Ted Wilson, Ph.D.**, is Professor of Biology at Winona State University in Winona, Minnesota. His research examines how diet affects human nutritional physiology and whether food/dietary supplement health claims can be supported by measurable physiological changes. He has studied many foods, dietary supplements, and disease conditions including pistachios, low-carbohydrate diets, cranberries, cranberry juice, apple juice, grape juice, wine, resveratrol, creatine phosphate, soy phytoestrogens, eggplants, coffee, tea, energy drinks, heart failure prognosis, diabetes, and obesity. Diet-induced changes have included physiological evaluations of plasma lipid profile, antioxidants, vasodilation, nitric oxide, platelet aggregation, and glycemic and insulineric responses using in vivo and in vitro models. With Dr. N. Temple he edited the first and second edition of *Beverages in Nutrition and Health* (Humana Press, 2004 and 2016), *Nutritional Health: Strategies for Disease Prevention* (Humana Press, 2001 first, 2006 second, and 2012 third editions), and *Nutrition Guide for Physicians*, first and second editions (Humana/Springer Press Inc., 2010). He also enjoys teaching courses in Nutrition, Physiology, Cardiovascular Physiology, Cell Signal Transduction, and Cell Biology. When not in the laboratory he enjoys family time, the outdoors, and farming.



**Norman J. Temple, Ph.D.**, is Professor of Nutrition at Athabasca University in Alberta, Canada. He has published 95 papers, mainly in the area of nutrition in relation to health. He has also published 14 books. Together with Denis Burkitt he coedited *Western Diseases: Their Dietary Prevention and Reversibility* (1994). This continued and extended Burkitt's pioneering work on the role of dietary fiber in chronic diseases of lifestyle. He coedited *Nutritional Health: Strategies for Disease Prevention* (2012; third edition), *Beverage Impacts on Health and Nutrition* (2016; second edition), *Community Nutrition for Developing Countries* (2016), and *Excessive Medical Spending: Facing the Challenge* (2007). He conducts collaborative research in Cape Town on the role of the changing diet in South Africa on the pattern of diseases in that country, such as obesity, diabetes, and heart disease.



**George A. Bray, M.D., M.A.C.P., M.A.C.E.**, is Boyd Professor Emeritus at the Pennington Biomedical Research Center of Louisiana State University in Baton Rouge, Louisiana, and Professor of Medicine Emeritus at the Louisiana State University Medical Center in New Orleans. After graduating from Brown University summa cum laude in 1953, Bray entered Harvard Medical School graduating magna cum laude in 1957. His postdoctoral training included an internship at the Johns Hopkins Hospital, Baltimore, MD, a fellowship at the NIH, residence at the University of Rochester, and a fellowship at the National Institute for Medical Research in London and at the Tufts-New England Medical Center in Boston. In 1970, he became Director of the Clinical Research Center at the Harbor UCLA Medical Center in Torrance, CA. He organized the First Fogarty International Center Conference on Obesity in 1973 and the Second International Congress on Obesity in Washington, DC, in 1977. In 1989 he became the first Executive Director of the Pennington Biomedical Research Center in Baton Rouge, a post he held until 1999. He is a Master of the American College of Physicians, Master of the American College of Endocrinology, and Master of the American Board of Obesity Medicine. Bray founded the North American Association for the Study of Obesity in 1982 (now the Obesity Society), and he was the founding editor of its journal, *Obesity Research*, as well as co-founder of the *International Journal of Obesity* and the first editor of *Endocrine Practice*, the official journal of the American College of Endocrinologists. Dr. Bray has received many awards during his medical career including the Johns Hopkins Society of Scholars, Honorary Fellow of the American Dietetic Association, the Bristol–Myers Squibb Mead–Johnson Award in Nutrition, the Joseph Goldberger Award from the American Medical Association, the McCollum Award from the American Society of Clinical Nutrition, the Osborne–Mendel Award from the American Society of Nutrition, the TOPS Award, the Weight Watchers Award, the Stunkard Lifetime Achievement Award, the Presidential Medal from the Obesity Society, and in 2019 the W.O. Atwater Award from the USDA and American Society for Nutrition. During his 50 academic years Bray authored or coauthored more than 2000 publications, ranging from peer-reviewed articles and reviews to books, book chapters, and abstracts reflected in his Hirsch (H) Index of 134. Bray has had a long interest in the history of medicine and has written articles and a book on the history of obesity.

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## About the Series Editor



**Adrienne Bendich, Ph.D., FASN, FACN**, has served as the Nutrition and Health **Series Editor** for more than 25 years and has provided leadership and guidance to more than 200 editors that have developed more than 90 well-respected and highly recommended volumes in the Series.

**In addition to *Nutrition Guide for Physicians and Related Healthcare Professionals 3rd Edition* edited by Ted Wilson, Norman J. Temple, and George A. Bray, the 40 newest editions published from 2012 to 2020 include:**

1. **Nutrition and Infectious Diseases: Shifting the Clinical Paradigm**, edited by Debbie Humphries, Marilyn Scott, and Sten H. Vermund, 2020
2. **Nutritional and Medical Management of Kidney Stones** edited by Haewook Han, Walter Mutter, and Samer Nasser, 2019
3. **Vitamin E in Human Health** edited by Peter Weber, Marc Birringer, Jeffrey B. Blumberg, Manfred Eggersdorfer, Jan Frank, 2019
4. **Handbook of Nutrition and Pregnancy, Second Edition**, edited by Carol J. Lammi-Keefe, Sarah C. Couch, and John P. Kirwan, 2019
5. **Dietary Patterns and Whole Plant Foods in Aging and Disease**, edited as well as written by Mark L. Dreher, Ph.D., 2018
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