Dedication

To Dana, Patrick, and Jake for their unending patience and support, and to the staff and students of the Frances Stern Nutrition Center for their insight and encouragement.
—Kelly

To my students who inspire me to work hard every day; to my colleagues and mentors who bring me perspective and keep me humble; and to my family who gives me strength, love, and purpose.
—Kathy
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Foreword

It is a pleasure to introduce Advanced Medical Nutrition Therapy by Kelly Kane, MS, RD and Kathy Prelack, PhD, RD to readers. I can testify that they are both master clinicians who bring readers the wisdom they have accumulated after several decades of clinical experience in academic medical centers in Boston. I am also well-acquainted with their ability to teach at both the graduate and undergraduate level.

The setting in which the authors practice is unique; Boston has long been known for the excellence of its education in the health sciences, and the book draws heavily on the resources of colleagues in the city. Among their many affiliations, both of the authors are faculty members of the Friedman School of Nutrition Science and Policy at Tufts University and the Department of Nutrition, Simmons College, which sponsors a didactic program in dietetics and combined dietetic internship/Master’s degree programs. Their clinical associations include Shriners Hospitals for Children, a pediatric burn and surgical specialty hospital; Massachusetts General Hospital; and the Frances Stern Nutrition Center at Tufts Medical Center, the oldest ambulatory nutrition service in the United States. The authors have used their access to excellent resources in the nutritional aspects of clinical medicine at both theoretical and practical levels to produce a textbook that is unique in that it reflects both the science and the art of the nutritional care of patients and members of the larger community.

Their book uses a practice-oriented, case-based approach that draws heavily on problem-based learning to engage the reader. The chapters include Clinical Controversies and Clinical Roundtable features on difficult topics. At the end of each chapter the reader will have mastered both the theoretical basis and the core clinical skills needed to deliver medical nutrition therapy and treat the patient.

The first section of the book provides a review of core concepts of clinical nutrition that are relevant to nutrition screening, assessment, and nutrition support. This is followed by a number of chapters that focus on various organ systems as well as infectious disease and the complications that are involved in critical illness. Chapters on various points during the lifecycle are also included.

The great strength of the book is that it is written by clinicians for clinicians. While it does not stint to provide the pathophysiology of the diseases and illnesses discussed, it spends most of its time in helping the reader develop and apply practical clinical nutrition expertise.

The chapter on nutrition in oncology and transplantation offers a good example of the strengths of the approach the authors have taken. The chapter begins with a brief review of why the topic is important and clearly states learning objectives. Next, core concepts and some background on the epidemiology and causation of common cancers are presented, along with methods for cancer staging and typical medical treatments of cancer. This is followed by an extensive section on clinical nutrition that includes screening and assessment of the cancer patient and nutritional support of different forms of cancers, including solid tumors, hematological cancers, and advanced cancers, as well as cancer cachexia. Complementary and alternative medicine is discussed in an evidence-based context. The chapter is interlarded with practical points and clinical case studies, heavily referenced with up-to-date citations, and concludes with a brief summary.

Instructors will welcome the Instructor’s Manual, a Test Bank with examination questions, and slides in PowerPoint format that may ease their teaching burdens.

I am acquainted with most of the authors of this textbook, and I can assure readers that they will find that this distillation of their wisdom is a welcome guide to mastering medical nutrition therapy.

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Preface

Advanced Medical Nutrition Therapy is designed as the primary text for an upper-level undergraduate or graduate-level Medical Nutrition Therapy or Clinical Nutrition course for nutrition majors. The text is designed to be a current, evidence-based, and practical nutrition resource for nutrition students, dietetic interns, nutrition professionals, and nonnutrition clinicians. Other trainees such as medical students or students enrolled in graduate programs in biomedical science may also have an interest in such a text. This text will present information that meets the needs of those at the graduate nutrition level, as well as those who have advanced academic backgrounds, but limited clinical experience, or clinicians of other disciplines (nurses, physicians, physician assistants, etc.).

Conceptual Approach

Advanced Medical Nutrition Therapy utilizes a practice-oriented, case-based approach that incorporates problem-based learning and engages the reader in various clinically based scenarios that guide the narrative text. This approach is designed to encourage the reader to digest the didactic scientific information while applying it to a patient-based clinical situation. The cases in the text provide the framework around which the didactic information is presented. By understanding the importance of the subject matter through application, the reader will look beyond the rote memorization approach that can be typical of science courses and integrate the science with the clinical scenario to gain a more complete understanding.

The text is practice-oriented with a strong clinical focus highlighting the treatment of the medical condition while incorporating the latest guidelines and research, with an emphasis on current topics. Commonly used formulas and equations are included to emphasize clinical application.

Organization

The first section of the text introduces the core concepts of nutrition, highlighting nutrition and biochemical assessment, nutrition support, and energy expenditure. These chapters provide the framework of the book. The next sections provide an overview of various disease states, including critical illness, wound healing, obesity, diabetes mellitus, cardiovascular disease, oral health, gastrointestinal conditions, kidney disease, liver disease, pulmonary disease, cystic fibrosis, solid organ transplantation, oncology/bone marrow transplantation, and HIV/AIDS. The last section provides an overview of nutrition in the lifecycle, outlining content on pregnancy, lactation, neonatology, pediatrics, pediatric obesity, eating disorders, developmental disabilities, and geriatrics, thus providing a comprehensive overview of medical nutrition therapy.

Features

Each chapter is designed to provide the reader the comprehension and skills to render effective nutrition care plans based on the fundamentals of diet and disease and existing research evidence. Each chapter introduces Core Concepts, which are important principles or themes that will be identified and highlighted to encourage functional learning. Learning Objectives are included at the beginning of each chapter to better assess student learning. A Case Study or clinical scenario introduces each topic and stimulates critical thinking by developing questions that are subsequently expanded upon in the text. Reliance on evidence-based practice via a Clinical Controversy is fostered through the introduction of research concepts in journal review. Discussion of clinical scenarios that do not have one clear, correct answer is covered in the Clinical Roundtable. Practice Points of useful clinical information are presented throughout each chapter to identify how it works “in the real world.” Key Terms also help to familiarize the reader with new concepts in an organized fashion.

Benefits

The text is designed for students and practitioners who are new to addressing nutrition in the clinical environment and who have more recently studied and learned the basics of metabolism (anatomy; physiology; and carbohydrate, protein, and fat metabolism, for example). It incorporates a clinical case presentation, with discussion throughout each chapter calling upon details of the case in order to reinforce the didactic science information, thus challenging the student to think outside of the classroom. This approach will allow the student to apply this information and reinforce learning.

The text more broadly covers nutrition in the lifecycle by integrating aspects of both adult and pediatric nutrition. This strong pediatric focus is reflected in chapters on general pediatrics, neonatology, pediatric obesity, developmental disabilities, and eating disorders. Presentation of both states allows for a more complete reference, and it provides an opportunity to better discuss the similarities and differences in various adult and pediatric states. The text also incorporates more specialized chapters on topics such as oral health, and it also features chapters on malabsorption, historically covered through content related to “upper gastrointestinal” and “lower gastrointestinal” disorders.

The text offers the versatility for use as both a classroom text as well as a clinical practice resource to integrate lectures with application and journal review. The text
ties the clinical information directly with instruction in one book. Reliance on evidence-based practice is fostered through introduction of research concepts and exercises in journal review.

Supplement Package
Instructors using Advanced Medical Nutrition Therapy will have access to a full suite of supplemental resources, including the following:

- Test Bank, providing examination questions for each chapter as well as Midterm and Final Exams
- Slides in PowerPoint format, including bulleted notes that can be easily customized
- Instructor's Manual, containing an array of useful instructor tools
- Image Bank, collecting photographs and illustrations that appear in the text

Kelly Kane
Kathy Prelack
Features of This Text

*Advanced Medical Nutrition Therapy* incorporates a number of engaging pedagogical features in order to emphasize how the content can be applied in practice.

Each chapter opens with a **Chapter Outline** previewing the topics to be covered.

**Core Concepts** establish important principles that will be explored in the chapter; they later reappear within the chapter text once the relevant content has been broached.

**Learning Objectives** establish what the reader can expect to learn from the chapter.

A comprehensive and instructional art package includes color photographs and illustrations throughout this text to add a visual dimension to the content being presented.
Each chapter begins with a Case Study, illustrating how topics discussed in the text might appear in practice. These case studies are revisited throughout the chapter, building in concert with the foundational material. Questions are incorporated to encourage active engagement with the scenarios.

Clinical Controversy boxes emphasize engagement with evidence-based content by highlighting areas where there may be disagreements in the literature.

Clinical Roundtable boxes highlight clinical scenarios that invite a multitude of possible approaches.
Brief Practice Points provide additional details relevant to clinical dietetics practice.

Key Terms appear in bold-face type throughout the text and are collected at the end of each chapter.

### Key Terms

- nutrition care process and model (NCPM)
- nutrition care process terminology (NCPT)
- malnutrition
- nutritional risk screening (NRS-2002)
- malnutrition universal screening tool (MUST)
- short nutritional assessment questionnaire (SNAQ)
- malnutrition screening tool (MST)
- anthropometry
- height
- stadiometer
- self-reported height (SRH)
- knee-height
- total arm span (TAS)
- half arm span (HAS)
- actual body weight
- usual body weight (UBW)
- percent usual body weight (%UBW)
- percent weight change (%weight change)
- ideal body weight (IBW)
- percent ideal body weight (%IBW)
- adjusted body weight
- dry weight
- body mass index (BMI)
- skinfold anthropometry
- triceps skinfold (TSF)
- mid-upper arm circumference (MUAC)
- mid-arm muscle circumference

### PRACTICE POINT

When considering the acutely ill inpatient population, assessing dietary intake prior to hospital admission and duration of poor oral intake will be particularly pertinent to the assessment. It is not unusual for patients in acute care to have had compromised dietary intakes for extended periods prior to admission.13

**Chapter Summary**

Assessment of current dietary intake and the influences of both physical and psychological factors on the patient’s nutrition status is the first step in the nutritional assessment process. The physical assessment includes the examination of the skinfold anthropometry, triceps skinfold (TSF), mid-upper arm circumference (MUAC), mid-arm muscle circumference.
We sincerely thank the contributors of this text who have devoted their time, energy, and passion to share their expertise. We could not have done this without you!

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