
As I do first when a new book arrives, I flipped this one open to the table of contents. Simulations in Biomedicine V reveals its breadth immediately upon opening it. The studies within cover various topics, including the cardiovascular system, the pulmonary system, vision, orthopedics, and intelligent environments for the elderly and infirm. The manuscripts presented in the book are conference reports from the Fifth International Conference on Computer Simulations in Biomedicine. The tie that binds most of the studies together is mathematical modeling and computational simulations. These models are used to analyze a large variety of medical and biological phenomena, both internal and external to the body.

Even the earliest analytical models of physiology (eg, representing the lungs as a simple resistance-capacitance circuit) improved our understanding of physiologic processes. As computers become faster and more abundant, we can expect numerical models to become increasingly complex, which in turn will enhance our understanding of physiology. The editors also note that the proliferation of computational power has the added benefit of helping physiologists, medical professionals, and engineers to acquire, analyze, manage, and visualize massive amounts of data. Simulations in Biomedicine V looks at the current state of the art in the convergence of computational simulations and health care.

The chapters are grouped into 12 sections, based primarily on physiologic focus, including: simulation of physiological processes; cardiovascular system; artificial limbs and joints; electrical stimulation; data acquisition and computer vision; analysis and diagnostics; applications of artificial intelligence in medicine; and virtual and intelligent environments. The organization scheme is consistent, although there are limitations imposed by the wide range of physiologic topics included and by this being a conference proceedings volume.

The first section, on simulation of physiologic processes, has a study of red blood cells, followed by a study of brain cooling. Several of the chapters in this section would have been better placed in one of the several cardiovascular sections, thus making them easier to find. In another odd pairing, a chapter about the mechanical properties of tumor cells is included in the section on electrical stimulation. With those few exceptions the sections form fairly cohesive groups.

Simulations in Biomedicine V is heavily weighted to the cardiovascular system; the editors included the pulmonary system as a subset of the cardiovascular system. With 4 sections devoted to the cardiac system, these chapters constitute more than one third of the book. It would be incorrect to conclude from this that the cardiovascular system is more suited to numerical simulations than other physiologic systems, or that most modelers choose to study the cardiovascular system.

Surveying the nonpulmonary cardiac sections gives the reader a good idea of the various computational approaches to cardiac physiology. One can use computational fluid dynamics to study blood flow in the coronary arteries, blood vessels in the brain, or flow near a heart valve. There are also a number of electronic circuits of various complexity that represent the cardiovascular system. These simulations are similar to others I have seen before; that is, they do not seem to be groundbreaking as much as slightly extending the current state of the art.

Only four of the chapters concern the pulmonary system. “Eulerian Multiphase CFD [Computational Fluid Dynamics] Analysis of Particle Transport and Deposition in the Human Lung,” by Kunz et al, used computational fluid dynamics in a realistic anatomic representation of a human lung to estimate particle deposition. This is a subject of recent interest in pharmaceutical delivery and inhaled contaminant absorption. However, this technique, like many others, has yet to be validated with any human or animal studies. Validation is a necessary step when you merge the biomedical engineering and medical worlds together.

One pulmonary study with potential real-world application is “Estimation of Respiratory Parameters During Mechanical Ventilation: A Simple Method Taking Account of Tubing Compliance,” by Brightenti et al. The authors showed that the tubing compliance in a ventilator circuit can affect the estimates of lung resistance and compliance. Through an extension of the model used to evaluate resistance and compliance, more accurate estimates of those variables can be calculated. This method is easy to implement without changing pieces of a ventilator circuit. Though there may be clinical promise in that and other studies, they are several years from provoking any change in care. But then, I am not sure that immediate changes in care are the purpose of this book. I consider this conference proceedings volume to indicate only the current state of the art of computational simulations.

Did I mention the mathematics? In this compendium of highly mathematical studies, there are various solution techniques, but most engineers will have a passing familiarity with many of them. This is one of the things that I enjoyed about Simulations in Biomedicine V. I cannot scientifically critique each of the studies, but I did understand the basics of most of the reports. It would have been nice to include at least a short index of the mathematical techniques used, since they are not unique to a given physiologic system but can be used for different physiologies that share similar traits. A prime example of this is the finite element method, which is used in this book to study orthopedic implants, soft-tissue deformation, a contracting myocardium, and brain cooling.

The chapters seem to be well developed in their methods. Given their required brevity, it is not surprising that some details are missing or that the results are few in some of the chapters. Again this speaks to the fact that this book is just an overview. A pleasant surprise was the consistency in style and font among the chapters, given the publisher’s disclaimer that the authors were responsible for their own typesetting; there were only minor differences in style. That said, many of the graphics are not up to par. It is my guess that the muddled graphics were originally in color but were not transformed to grayscale before printing. That is a minor problem for many of the schematic draw-
ings, but the lack of color differentiation in 3-dimensional flow fields, stress fields, and displacements makes those graphics almost worthless, especially when both the high and low ends of the scale bar appear black. The line art is generally better, but some of these figures are so pixilated that I felt I needed stronger glasses. It is unfortunate that studies so heavily depend on computers for their completion are not supported by plots worthy of their results.

One of the more intriguing nonacademic aspects of this book was the cover art. At first glance one notices the outline of a female body with several internal organs. Closer examination shows that some of the organs are not physiologically accurate. And there is a breast nipple peeking out of the shadow of some title text. I guess we should be thankful that her genitals are hidden by a large molecule “fig-leaf.”

I believe in the editors’ vision that progress in computational biomedicine will continue to advance health care, and I enjoyed my romp through the areas of physiology and mathematics that I do not deal with on a day-to-day basis. But if you are not comfortable with terms like “computational fluid dynamics,” “finite element methods,” or “electrical circuit analogues,” this book is probably not for you. Even if you are, I think the overwhelming breadth of this book and the cover price of $269 will keep it off many bookshelves, save the libraries where it most appropriately belongs.

Melissa A Krueger PhD
Division of Pulmonary and Critical Care Medicine
University of Washington
Seattle Washington


The ACLS Quick Review Study Guide is an appropriate textbook for first-time advanced cardiac life support (ACLS) students and for those renewing certification. It starts with basics and explains concepts simply yet thoroughly, making it useful for both physician and nonphysician learners. At 400 pages it is not really a “quick review” but instead is a user-friendly text for students who aspire to master the material.

The book is visually appealing and easy to use. The table of contents is color-coded to match the chapters, for rapid page-flipping. Pre- and post-tests are clearly written, are of similar difficulty to the actual ACLS final exam, and have useful explanations of the correct answers. Each chapter has an overview, followed by the material written in outline format, and a concluding test, with answers. Some sections are followed by study questions. I found no factual errors in the text or quizzes, and only one typographical error. Valuable enrichment material, such as relevant research data, is set aside in boxes to distinguish it from the text. Photographs, electrocardiogram tracings, and multicolored diagrams grace nearly every page, are of excellent print quality, and are well chosen to illuminate the material. The chapter on airway management is particularly well illustrated with diagrams of the relevant anatomy and photographs of airway devices.

The book is indexed, but not thoroughly; for example, the listing for “tachycardia” leads you to rhythm identification but not to tachycardia differential diagnosis or therapy. The reference lists and bibliographies in each chapter are impressive. The studies chosen from the primary literature are relevant and recent, many from 1999 and 2000.

This is a well-organized curriculum for teaching or learning ACLS. The first chapter covers initial survey and basic life support techniques, community and organizational issues in resuscitation, when to start and stop resuscitation, and needed topics in ethics and communication. Chapter 2 is a presentation of airway management that is extremely thorough yet builds from basic principles, making it valuable to students with little background in respiratory therapy. Chapter 3, on vascular access, is similarly useful and very well illustrated. Rhythm recognition is a difficult topic for many ACLS students, and Chapter 4 has as good an approach as I’ve seen to rhythm diagnosis. The illustrations of depolarization and repolarization are confusing, but otherwise the chapter addresses cardiac electrophysiology at the right level to get a novice student through rhythm recognition. I imagine many students will struggle through atrial tachycardia, atrioventricular reentrant tachycardia, and atrioventricular nodal reentrant tachycardia, but I haven’t seen any basic text that does a better job at elucidating this advanced topic. The sample strips illustrate the chosen rhythms well and are and clearly reproduced.

Chapter 5 does a good job of describing procedures that are best demonstrated live, such as defibrillation and pacing. Coronary syndromes are covered thoroughly, again starting with basics of anatomy and pathophysiology to accommodate students with different backgrounds. Chapter 5 incorporates treatment algorithms for potential complications of myocardial infarction such as dysrythmias, pulmonary edema, hypotension, and shock. I think this material is misplaced here. Relocating this material to the algorithm-heavy “Putting It All Together” chapter would be more useful, since a student wanting to review shock would not logically look for it in the acute myocardial infarction chapter.

“Cardiovascular Pharmacology” (Chapter 7) is disappointing, marred by an overly detailed presentation of the autonomic nervous system, followed by tables in which each medication gets a page of small print, not a distilled version of what actions, doses, and contraindications are really crucial for students to learn.

“Putting It All Together” (Chapter 8) presents the author’s versions of the ACLS algorithms and is the key chapter for mastering ACLS. The algorithms are presented as tables, which are clearly written and fairly amenable to memorization. There is hardly any explanatory text, which has the advantage of making the chapter easy to review but has the disadvantage of making it a daunting read for a student without much clinical experience. In addition, this lack of explanation puts the chapter out of step with the rest of the book.

Chapter 9, on stroke, returns to the book’s usual style, starting with anatomy and proceeding through a detailed description of clinical syndromes. Inclusion and exclusion criteria for thrombolysis are mentioned but, strangely, are not highlighted, and no suggestions for blood pressure control are given.

The final chapter, “Case Presentations,” is well designed to prepare students for the practical examination in an ACLS course. Each case has a wealth of open-ended questions, plus a list of essential and unacceptable actions. These cases make a perfect review for the experienced provider and al-
low less experienced students to simulate a megacode for each other.

In summary, I would strongly recommend this book to a first-time student of ACLS as a comprehensive and, in most sections, easy-to-study text. In addition, its organization, with the relatively short “Putting It All Together” and “Case Presentations” chapters, allow renewing or more advanced practitioners to use the book efficiently as a review.

The Rapid ACLS Pocket Guide is a 3×5-inch, fluid resistant, spiral-bound book meant for bedside use. The sections are color-coded and correspond to the ACLS Quick Review Study Guide. Additional sections contribute information on basic life support and pediatric and neonatal resuscitation. This narrow, chunky book takes up a lot of space in the pocket of a white coat but is just the right size to attach to a code cart. However, I do not think the book is optimally written for use during a code. For example, suppose one needed immediate help in treating a tachycardic patient. There is no table of contents and the index is not complete. Under “tachycardia” the index references a page on identifying supraventricular and multi-focal atrial tachycardia. There is no direction to other tachycardias, to a differential diagnosis, or to a treatment algorithm. By flipping through the 26-page section entitled “The ACLS Algorithms” one can find tachycardias, but there is no overview of treatment priorities, only lists of possible interventions for each specific rhythm. Anyone but the most experienced provider would find this a frustrating reference in the heat of the moment.

The strongest sections of this book are “Vagal Maneuvers and Electrical Therapy” and the sections on pediatric and neonatal resuscitation. The section on electrical therapy includes step-by-step instructions for defibrillation, cardioversion, automatic electronic defibrillator use, and pacing, which could be read aloud during a code for practitioners who rarely perform these procedures. The pediatric and neonatal resuscitation sections are concise and therefore easy to use. Additional helpful pediatric data, including normal vital signs and equipment sizes, is listed in the “Facts and Formulas” section, just a page away.

“Cardiovascular Pharmacology,” a section likely to be used during a code, has strengths and weaknesses. This alphabetical list of medications gives doses, indications, mechanisms of action, and precautions for each drug, and these pages are concise and easy to read. However, an important weakness is that trade names are included in parentheses but not indexed, so one would be at a loss to find “Levophed” or “Reopro.” Similarly, “metoprolol” is under “B” for “β blocker.” Bizarrely, thrombolytics are included, though heparin and glycoprotein IIb/IIIa inhibitors are.

Long sections of the book are not appropriate for a bedside reference. For example, this 178-page book includes 42 pages on dysrhythmia recognition and 20 pages on the symptomology and electrocardiogram features of acute myocardial infarction. These sections might be useful for a student to study during slow times in the emergency department, but it is hard to imagine that they could be anything but distracting during acute patient care. In contrast, the section on stroke is too short to be helpful: it lists the Cincinnati Prehospital Stroke Scale and a differential diagnosis, but there is no checklist for thrombolysis, no dosages for thrombolytics, and no guidelines for blood pressure control during ischemic or hemorrhagic stroke, all of which are essential reference material to have at your fingertips at the patient’s bedside.

The heart of this book is the ACLS algorithms. These have been formatted into lists, not charts or flow diagrams, to fit the book’s dimensions. These lists would make acceptable prompts during a code, but they do not illuminate the logic of ACLS, making it difficult to understand the algorithms or to approach patient scenarios with flexibility. This pocket guide would not be my first choice for either patient care or for learning ACLS.

The video Success in ACLS: Essential Skills is designed to teach the clinical skills that are difficult to teach with a textbook. The video has a clean look and good sound and picture quality. The captions are easy to read, even on a small screen. The first half of the video shows paramedics performing procedures on mannequins in a studio, interspersed with footage from actual resuscitations. Airway procedures performed include use of oxygen delivery devices, suctioning, noninvasive airway adjuncts, and insertion of a laryngeal mask airway and endotracheal tube. Defibrillation, cardioversion, pacing, and use of an automatic electronic defibrillator are also demonstrated. Indications for these interventions are mentioned, but ACLS algorithms are not illuminated: this video is for teaching skills only. The accompanying booklet amounts to lecture notes for the video, which obviates taking notes. The booklet is in black-and-white, has only a few illustrations, and would not be an inspiring learning tool outside of its use with the video.

The second half of the video reviews dysrhythmias at a very basic level. Jazzy music accompanies a moving tracing of various rhythms, along with a printed description of the rhythm. This section starts inauspiciously with “regular” (not “normal”) sinus rhythm. A single strip represents supraventricular tachycardia, without reference to the multiple types of supraventricular tachycardia, recognition of which is essential to following ACLS guidelines. Second-degree heart block and junctional escape rhythms are also simplified to the point of inaccuracy. The accompanying section of the booklet reiterates the overly elementary descriptions of the rhythms. The only benefit I see of this section of the video is to show students what rhythms look like on a monitor as opposed to a printed strip. It is not a useful tool for teaching rhythm recognition at the level expected of ACLS students.

The booklet includes several sections not in the video. There is a glossary and a very brief description of the “ABCDs” (airway, breathing, circulation, differential diagnosis) of ACLS, a list of common ACLS medications, and ACLS protocols reproduced in small print from ACLS Quick Review Study Guide. The pharmacology section is more concise than the corresponding sections in the textbook and the Rapid ACLS Pocket Guide, but it is still a list, not arranged for teaching or learning in context. In an improvement over the Pocket Guide, thrombolytic medications are listed. However, the same indexing problems and inconsistencies are found in both works. For example, β blockers are listed under a group heading, but alteplase, anistreplase, streptokinase, and tenecteplase all warrant their own separate headings.

In summary, this video has value for teachers as a way of introducing students to airway and electrical therapy skills. The dysrhythmia section is too basic to be useful, and the pharmacology and ACLS algorithm sections of the booklet are not illuminating enough to justify the purchase.

Amy Baernstein MD
Emergency Trauma Center
Harborview Medical Center
University of Washington
Seattle, Washington

The highly anticipated 5th edition of Bennett and Elliott’s Physiology and Medicine of Diving has arrived, and it is a text well worth the wait. This book has held a special place in the field of diving medicine since the first edition appeared in 1969 under the original editorial team of Peter Bennett and David Elliott, and the latest offering loses nothing by comparison to that signal publication. This is the first edition under the new editorial team of Alf Brubakk and Tom Neuman, and follows a 10-year hiatus during which much has changed in this rapidly developing field. Though much of the book is directly addressed at the diving physician and diving scientist, there is a wealth of information here for nursing and technical staff. Respiratory team members will be particularly interested in the earlier chapters, which deal with the lung under pressure, breath-hold diving, and drowning, whereas there is probably more of interest to the internist, neurologist, and orthopedist in the later chapters, which deal with the consequences of bubble injury. This book is indispensable to any recompression facility library.

The book is considerably bigger than the preceding edition and is now quite an imposing text—too big to balance on your chest in bed at night! Consequently, however, there is considerable new information and expansion on themes that space did not previously permit. The book itself is sturdy and appears well bound, with an attractive cover design that shows a diver in close proximity to a very large whale indeed. It is certainly an improvement on the rather odd and dysmorphic representation of a diver on the cover of the 4th edition.

Bennett and Elliott’s Physiology and Medicine of Diving is a comprehensive review of all aspects of physiology and medicine as they relate both to undersea diving and other situations where humans breathe compressed gases. The editors’ primary goal, as it was in previous editions, was to provide “an up-to-date review of the current state of knowledge” in the field. The scope is wide, but the editors have selected a total of 45 specialists from around the world and integrated their expertise to produce a digestible synthesis of the state of the science in 2003.

I read the 3rd edition of this book in 1992 when I began work in Sydney at a clinical hyperbaric facility where we have a substantial caseload of diving injuries. The world of pressure and hyperoxic physiology that unfolded before me during that time was a career-changing revelation. I am sure there are young workers in the field today who will experience a similar sense of fascination as they trawl through this text. It is an excellent summary of our current state of knowledge, and the whole reads well enough for the most part to enable the novice to progress in a logical manner through history and basic physiologic concepts, to the more medical chapters on decompression theory, clinical manifestations, and treatment of decompression disorders. On the other hand, there is certainly enough detail here to make this text an essential reference for the experienced clinician and diving scientist.

The book is logically organized and is generally well set out. Starting with an introduction by Christian Lambertsen, in a reprise of his introduction to the first 2 editions, the chapters lead us through history, a brief explanation of diving methods covered in the book, a review of physiology on a broadly systems-based approach, the particular effects of pressure on biological systems, decompression theory, and into the medicine of decompression illness and long-term effects of diving. There is, in addition, a thorough discussion on the fitness-to-dive assessment of candidates for professional and recreational diving, the forensic aspects of dive accident investigation, and a discussion of common diving equipment.

Each chapter is presented in a 2-column format and subdivided into attractive single-column banners. I found the sequential development of all the chapters quite logical and easy to follow. Taking Chapter 3, “Ventilation, Gas Exchange and Exercise Under Pressure,” as an example relevant to respiratory care, there is first a brief introduction, following which Camporesi and Bosco take the reader through a general discussion of the metabolic requirements of exercise and the means by which we might measure oxygen consumption and carbon dioxide production underwater. This is followed by a discussion of the physiology of alveolar and arterial gas tensions, with special reference to the undersea environment, leading naturally into ventilatory requirements and the mechanics of breathing—a subject of particular importance in relation to both underwater breathing circuits and increasing gas density at depth. This is a detailed, well-referenced section and would be of great interest to respiratory therapists and respiratory and intensive-care physicians. The chapter continues with a discussion of the control of breathing, with a particular emphasis on the role of carbon dioxide at depth, and finally a fascinating summary of the respiratory effects of submergence and the implications of a head-up versus prone position in a column of water. The (many) references are presented by name-of-first-author and year within the body of the text, and arranged alphabetically after each chapter. The other chapters cover their material with a similar level of competence and thoroughness.

A minor criticism is that the alphabetical (rather than numerical) sequence of citations means more page-turning and inconvenience when attempting to assess a statement that is followed by several citations. This format also somewhat distorts the flow of the text at times. As the citations are not numbered, I cannot easily produce an example of the number of citations for a typical chapter—the chapter summarized above, for example, is followed by nearly 7 pages of references in a small font!

Physically the book is a treat. Handsome and well presented, the layout is straightforward and elegant, with high-quality line drawings and tables. The figures are particularly well rendered, with clarity aided by the avoidance of color. Figure 9.4.4 (page 364), for example, renders clearly and precisely the complex nature of potential sites for oxygen free-radical damage. The same clarity applies to the text, where the fonts used are limited in number and easy to read. The editors have avoided a busy style in favor of a simple approach that I find both relaxing and conducive to comprehension. Perhaps the only area in which color may have assisted is in the reproduction of clinical photographs, such as Figure 10.6.4 (page 584), in which a color plate of facial lymphatic decompression sickness would have better represented its clinical appearance.

To the credit of all concerned, there are relatively few typographical errors and the writing style is generally clear and concise. The index is useful, if a little sparse, and might have been somewhat expanded. For example, “anticoagulants” yields a reference to the possible utility of these agents in the
treatment of decompression illness in Chapter 10 but not to the very useful reference to anticoagulants as a possible contraindication to diving, on page 713, in Chapter 12, “Fitness to Dive.”

There are a number of interesting changes since the previous edition appeared 10 years ago. Principal among these, and reflecting an ongoing debate within the field, is the nomenclature of bubble injuries related to breathing compressed gases. The editors have clearly spent some hours debating the merits of the various approaches and settled on a consistent representation that sits well in a multi-author text of this nature. In brief, the editors have chosen to return to the more traditional nomenclature based on the physiologic mechanisms of bubble injury when discussing physiology and mechanisms of action, and to adopt the more clinical nomenclature when dealing with diagnosis and treatment. Thus, in the majority of chapters authors have been required to use “decompression sickness” when referring to conditions resulting from the evolution of gas within the tissues, and “arterial gas embolism” when referring specifically to gas introduced into the vasculature following pulmonary barotraumas.

Importantly, however, in those chapters devoted to the clinical manifestations and treatment of decompression disorders, they adopted the rather more useful clinical approach of combining both these mechanistic terms under the umbrella term “decompression illness.” The clinical utility of this approach reflects the considerable overlap in clinical presentation between these 2 distinct mechanistic models, and the reality that treatment of the two is very similar in clinical practice. Although potentially confusing, the different approaches are clearly explicated and allow the reader to consider both basic mechanisms and clinical diagnosis without a continual reiteration of the precise meaning of pathology terms at the start of each chapter. There is logic in this approach, which may well become the standard throughout the field and bring an end to the sometimes acrimonious debate between physiologist and clinician. A full explanation of this debate is given at the beginning of Francis and Mitchell’s chapter, “Manifestations of Decompression Disorders.”

New chapters include those on comparative diving physiology in mammals, drowning, and the biochemistry of oxygen under pressure. Many other chapters have been extensively rewritten by new authors, with a fresh perspective (eg, the chapters on long-term effects of diving). In general this edition is more clinical than those preceding and therefore of more general application for clinicians as well scientific and military diving units.

In summary, Bennett and Elliott’s Physiology and Medicine of Diving remains a benchmark of texts in the field. I thoroughly recommend it as an essential reference for any diving medicine facility and suggest that many individual diving physicians and scientists will wish to secure a personal copy. Though the price tag is not inconsiderable, it is in keeping with the efforts of the individual authors and the quality of the editors’ contribution. Let us hope we do not need to wait another 10 years for the next edition.

Michael Bennett DipDHM
Department of Diving and Hyperbaric Medicine
Prince of Wales Hospital
University of New South Wales
Randwick, Australia


From Nutrition Support to Pharmacologic Nutrition in the ICU provides an update on nutritional support of the critically ill adult intensive care unit (ICU) patient. The book’s stated aim is, “to help clinicians optimize their competence and understanding in managing critically ill patients.” International experts on nutrition wrote the book’s 34 chapters. Each chapter focuses on a specific aspect of nutrition support for this population. The chapter topics range from the basics of nutrition assessment, monitoring, and provision of enteral and parenteral support to more esoteric topics such as new nitrogen-containing substrates and stress-related catabolic countermeasures. As a somewhat “old dog,” I figured it was unlikely I would be reading any “new tricks” in this book, but I was pleasantly surprised to find much that captured my interest. I found myself marking up the book so I could come back to explanations of many fresh concepts, and the book inspired me to look up several original-source references listed in its interesting discussions, including articles by Berger et al on micronutrient balances in trauma and burn patients; by Frost et al on gastric emptying in the critically ill; by Zaloga et al on the effect of rate of enteral nutrient supply on gut mass; by Vernon and Hill on the relationship between tissue loss and function; and one by Ingenbleek et al that describes a diagnostic inflammatory and nutritional index scoring method for critically ill patients.

This book is written for clinicians, including medical students, who want to optimize their understanding of nutritional support of the critically ill. This book would be most useful for physicians, registered dietitians, pharmacists, and nurses who provide nutrition support for the critically ill. Certain chapters of the book would be of interest to respiratory therapists who work in the ICU, such as the chapter on nutrition effects on respiratory and muscle dysfunction, and the chapter on nutritional support in acute respiratory failure. This book would be excellent for any advanced class on nutrition support of hospitalized patients or to brush up on the current hot topics in nutrition support of the critically ill for those new to this field.

Each chapter begins with an overview of the basic concepts of a subject and then delves into more “state-of-the-art” aspects. And, overall, each chapter succeeds in meeting that goal. The chapters are logically arranged. The book begins with a chapter on nutrition-related outcomes in critical care. The following chapters cover diverse subjects, with some of the more novel being “Host Defenses and Bacterial Assaults: A Delicate Balance,” “From Structure to Function: What Should Be Known About Building Blocks of Protein,” “Fatty Acids, Lipoproteins, and Lipid Emulsions,” “Trace Elements and Vitamins,” “Antioxidants in Critical Illness,” “Strategies for Motility and Dysmotility in Nutrition Support,” “Formulation of Parenteral and Enteral Admixtures,” “Drug-Nutrient Interactions in the Critically Ill,” “A Practical Approach to Feeding Intensive Care Patients,” “Monitoring Nutritional Support in the Intensive Care Unit,” “Nutritional Effects on Respiratory and Muscle Dysfunction in Intensive Care Unit Patients,” “Liver Function: Alteration and Insufficiency,” “Nutritional Support in Acute Respiratory Failure,” “Hypoglycemia and Blood Sugar Management: Implications for Infection,” “Nutrition Sup-

Though some redundancies occur among some of the chapters, as is common in a book of this nature, I did not find them distracting. Rather I found much new material to ponder. The chapter by Kudsk on host defenses and bacterial assaults discusses new theories on how enteral nutrients may positively affect the immune system. The materials presented are topical, such as chapters discussing nutrition support of the obese patient and immunonutrition in the ICU. The chapters are, for the most part, well written. Some typographical errors can be found, but not so many as to be of concern.

It is difficult to pick out the highlights of the book, because there are so many, but one particularly interesting chapter was Tappy and Chioléro’s chapter on carbohydrate and fat as energetic fuels in intensive care unit patients, which discusses an interesting theory that enteral carbohydrates may have advantage over parenteral carbohydrates. They theorize that since enteral carbohydrates have lower glycemic index than parenteral carbohydrates, enteral carbohydrates provide more stimulation of gut hormone release. Additionally, enteral carbohydrates are delivered via the portal system rather than systemically (as parenteral carbohydrates are), which may be advantageous.

The chapter by Powell-Tuck and Goldhill is one of the best summaries I have read on monitoring nutrition support of intensive-care patients. Their section on body composition measurements is outstanding. I intend to make this chapter required reading for nutrition students rotating through the surgical-trauma intensive care unit.

Recognized United States experts on nutrition support wrote several chapters in this book. One thing that makes this book special is that many European experts also contributed chapters, which discuss therapeutic approaches not usually used here. That international perspective adds to the overall quality of the book.

Most information in the book is very up to date, except in a few instances. The chapter on strategies for motility and dysmotility in nutrition support suggests the use of Cisapride, which is no longer available in the United States because of safety problems. And the chapter on hyperglycemia and blood sugar management does not discuss the landmark study by Van den Bergh et al on intensive insulin therapy in critically ill patients. The failure to incorporate the Van den Bergh study reflects the unfortunate effect of the lag time between writing and publishing a book, which results in some outdatedness, even when the book is hot off the press.

From Nutrition Support to Pharmacologic Nutrition in the ICU is an attractive softbound book and has reasonably sized type. The graphs, charts, and illustrations are readable, and it is of the proper size and weight for ease of reading. Its cost is a bargain, considering its reference value. I found each chapter worth reading; the reference lists at the end of each chapter are enough to make this book a “must-read” for any serious provider of nutrition support to the critically ill adult.

Catherine Lee Farver RD CNSD
Nutrition Services
Department of Hospitality Harborview Medical Center
University of Washington Seattle, Washington

REFERENCE


Drugs for the Treatment of Respiratory Diseases is described as “comprehensive” and is one of the first texts to survey current and novel drug treatments for respiratory diseases. It was edited by Spina, Page, O’Connor, and (the late) William Metzger and contains 23 chapters by 38 authors. Twelve of the authors are from the United States and twenty-six are from Britain and Europe, which reflects in the discussions on pulmonary drugs and therapies available in Europe. The chapters are grouped into 6 parts.

Part I, “Asthma and COPD,” reviews the pathophysiology of and the drugs used to treat asthma and COPD [chronic obstructive pulmonary disease]. The sections on the pathophysiology of asthma and COPD are thorough, and chapters on drugs cover glucocorticosteroids, β adrenoceptor agonists, anticholinergic bronchodilators, allergy drugs, drugs that affect the synthesis and action of leukotrienes, theophylline and selective phosphodiesterase inhibitors, potential therapeutic effects of potassium channel openers, tachykinin and kinin antagonists, drugs that affect immunoglobulin E, and drugs that target cell signaling. The drug chapters begin with introductions of the drugs’ effects on pulmonary and cellular tissues and then review the pharmacokinetics, clinical efficacy, and adverse effects. The chapters on investigational therapies discuss the rationales for the drugs in asthma and COPD and give an overview of which compounds might be clinically useful. This section spans the therapeutic range from the general agents used to treat asthma to cellular- and receptor-specific agents that may become therapeutic alternatives in the future.

Part II, “Diffuse Parenchymal Disease,” focuses on treatment of parenchymal lung disease and fibrotic lung disease. The various types of parenchymal lung disease, their diagnosis, clinical presentation, and treatment are discussed. The chapter on fibrotic lung disease overview the difficulties of diagnosing and evaluating outcome, pathogenesis, and potential new drug therapies.

lines reflects the European bias of the book. The authors talk about the promising aspects of sparfloxacin and grepafloxacin, 2 fluoroquinolones that have been removed from the American market. There is a limited discussion on novel antibiotics for community-acquired pneumonia. The chapter on chronic bronchial suppuration reviews the pathophysiology, microbiology, and clinical features of COPD. There is an overview of the nonpharmacologic therapy for COPD and an extensive discussion of the principles of antibiotic treatment and antibiotics used to treat COPD. The cystic fibrosis chapter reviews the antibiotic and nonantibiotic therapy of cystic fibrosis. The discussion on antibiotic therapy reviews the general principles but also provides discussion on prophylaxis, suppression, and therapies for specific pathogens. The chapter also highlights the various therapeutic interventions for treating Pseudomonas aeruginosa infections.

Part IV, “Pulmonary Vascular Diseases,” is divided into 3 chapters that review the pathophysiology and current and future therapies for pulmonary vascular disease. The pathophysiology chapter reviews the general mechanisms of pulmonary arterial hypertension, pulmonary vascular remodeling, and the genetic contribution to vascular disease. The section on current therapies for pulmonary vascular disease briefly reviews the definition and classification, clinical assessment, investigation, and selection and evaluation of drug therapies. This chapter reviews the agents available for treating primary and secondary pulmonary hypertension, their selection, administration, monitoring, and determination of a positive response. The future therapy chapter discusses agents targeted at inhibiting inflammation, metalloproteinases, and suppressors of vascular smooth muscle growth.

Part V, “Lung Cancer,” is limited to the molecular pathology of lung cancer and small-cell cancer. The chapter on the molecular abnormalities of lung cancer provides an extensive discussion of the genetic changes in lung cancer. The chapter on small-cell cancer reviews staging, tumor markers, prognostic factors, and chemotherapy.

Part VI, “Cough,” includes 2 chapters, one that thoroughly discusses the mechanism of cough and the second that reviews the current treatments of cough. The chapter on cough mechanisms reviews the physiology and anatomic site of cough, the role of the central nervous system, and the site of action of antitussive agents. The other chapter thoroughly reviews therapy of chronic cough, the various disease states associated with cough, and the nonspecific antitussive therapies.

The strength of the book is its in-depth discussion of each topic. The authors use figures, radiographs, and tomography images to support their discussions. The overviews of pulmonary pathophysiology form the bases for the discussions of the drugs. The physiology sections discuss the basic clinical physiology of the respiratory diseases and genetic alterations that account for the disease state physiology. The pharmacology chapters discuss the contemporary agents used to treat respiratory diseases and also provide an update on currently experimental therapies. Another strength of the book is its chapter bibliographies, which are exhaustive and include classic and contemporary reports.

Drugs for the Treatment of Respiratory Diseases meets its goal. It is as current a pharmacology reference as one can expect and reviews the drugs commonly used to treat respiratory diseases as well as the agents that may be available in the future. The book is geared toward the pulmonary subspecialist who is interested in the physiologic and pharmacologic basis of drug treatment of pulmonary disease. It is not geared to the primary care provider who is looking for a dosing reference for commonly prescribed pulmonary medications. This book would be a welcome addition to any pulmonologist’s reference library.

Gregory M Susla PharmD
Pharmacy Consulting Section
VHA Consulting Services
Frederick, Maryland


I have used the first version of this book for several years and found it a useful source for short-answer essay questions that cover physiology concepts, from the basic to the advanced. The second edition has been updated. New chapters have been added—on cell signaling, physiologic genomics, bone physiology, endocrine-metabolism integration, endocrine-immunity integration, and the physiology of aging. The chapters on cardiovascular physiology and respiratory physiology have been substantially expanded. The content is formatted as essay-type questions, with the answer following each question.

This book will be a useful source of information to anyone interested in physiology. The material is clearly and concisely organized and easy to read. The author states that the book is “designed to be used as an adjunct to, not a substitute for, a standard textbook,” and I agree that the book will be a useful adjunct for understanding both basic and advanced physiology concepts.

I did find several glaring errors that need to be corrected in the next edition. In the chapter on cells, nerves, and muscles there is a table that compares intracellular and extracellular concentrations of electrolytes and glucose. The table gives the intracellular and extracellular concentrations of glucose as 100 mg/dL, and approximately 10 mEq/L, respectively. The extracellular value should be approximately 90 mg/dL. On page 4 of the same chapter, in the discussion of diffusion coefficients, the author used a hypothetical plasma membrane with an “area of 1 cm.” That should be “1 cm².” In chapter 4, on cardiovascular physiology, it is stated in a discussion of the cardiac muscle action potential that the “long plateau phase of up to 300 ms . . . provides time for cardiac filling.” That statement is inaccurate: the plateau phase allows for adequate calcium influx for excitation-contraction coupling to occur. In that same chapter, on page 77, in a discussion of vascular resistance the Poiseuille’s equation is given as:

$$R = \frac{\pi r^4}{8 \eta l}$$

That equation is upside down and will therefore lead to the wrong conclusions about the effects of radius, vessel length, and blood viscosity on vascular resistance. Later in the book, on page 133, in the section on renal physiology, the equation is given correctly.

In the chapter on respiratory physiology I found several errors that need to be corrected. On page 98 the term “expired minute volume” is used. This may be my personal bias, but I believe that should be “expired minute ventilation,” not “volume.” The discussion of Fick’s law of diffusion, on page 106, gives an incorrect equation:

$$D_{\text{eff}} = A \times D/T \times (P_1 - P_2)$$
The correct equation, which is accurate in the first edition of the book, should be:

$$D_{gas} = \frac{A \times D_c}{T} \times (P_1 - P_2)$$

In the figure on page 109 the arrows showing the distribution of ventilation and perfusion of the lungs are confusing. The figure is trying to show an increase in both ventilation and perfusion, but it shows a difference in ventilation-perfusion ratio between the apex and the base of the lungs.

The first question on page 113 asks, “Under what circumstances would mixed venous oxygen tension be equal to inspired oxygen tension?” This question needs to be corrected by changing “mixed venous” to “alveolar.” Then the answer is correct.

On page 113, in the discussion of oxygen content, the amount of oxygen bound to hemoglobin is stated as 1.34 mL oxygen per gram of hemoglobin. Some have asserted that the value 1.34 mL is no longer valid and that 1.39 mL is the actual value, but that is still a disputed issue.1–3

The discussion of hypoxic drive on pages 119 and 120 needs to be updated. The description of the role of hypoxia in stimulating ventilation by stimulation of the peripheral chemoreceptors is accurate. However, the statement that “the drive can be dampened by supplemental oxygen, and thus, when titrating oxygen it is best to monitor the $P_{aco_2}$ as well as the $P_{ao_2}$” may not be completely correct. Though I agree with the latter part of that statement, recent research indicates that the increase in $P_{aco_2}$ might be by pulmonary mechanisms and not the dampening of the hypoxic drive. The discussion of ventilation changes during exercise, on page 121, states that “changes in ventilation can be accomplished by increasing tidal volume, respiratory rate, frequency, or a combination.” That sentence should have either “respiratory rate” or “frequency” removed, since they are equivalent.

The chapter on renal physiology shows an incorrect version of Starling’s equation for fluid flux between plasma and interstitial fluid. The discussion of creatinine clearance, on page 132, incorrectly calls it “cre- atine” in one place. In the chapter on endocrine physiology, the substance involved in peptide hormone action at the cell membrane is identified as IP2 (on page 201). That should be IP3 (inositol trisphosphate).

The final section of the book consists of a set of multiple-choice questions for each chapter. Although I have not used these questions extensively, they appear to be helpful for quickly testing one’s mastery of the physiologic concepts in each chapter.

Even with the minor errors I have outlined, I found this book an excellent source for review of physiology concepts. The answers to the essay questions are easy to understand and are short and to the point. Although the book is aimed mainly at medical students in medical physiology courses, I would recommend it to any respiratory therapist, nurse, or physician to review medical physiology. I highly recommend this text as an excellent supplement to current textbooks in medical physiology.

Wesley M Granger PhD RRT
Department of Critical Care Respiratory Therapy Program
University of Alabama at Birmingham
Birmingham, Alabama

REFERENCES