

Bennett and Elliott's Physiology and Medicine of Diving, 5th edition. Alf O Brubakk MD and Tom S Neuman MD, editors. London: Elsevier Science. 2003. Hard cover, illustrated, 779 pages, \$149.

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 di-

gestible 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 require-

ments 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 disturbs 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 spare, 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.

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From Nutrition Support to Pharmacologic Nutrition in the ICU. Claude Pichard MD PhD and Kenneth A Kudsk MD. (Update in Intensive Care Medicine, volume 34, Jean-Louis Vincent MD PhD, series editor). Berlin: Springer-Verlag. 2002. Soft cover, illustrated, 483 pages, \$49.95.

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 prognostic 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," "Hyperglycemia and Blood Sugar Management: Implications for Infection," "Nutrition Sup-