

**Handbook of Practical Critical Care Medicine.** Joseph Varon MD and Robert E Fromm Jr MD MPH. Berlin: Springer-Verlag. 2002. Soft cover, illustrated 518 pages, €39.95, US \$40.

This is a compact book presented in outline form. Needless to say, to review *all* of critical care medicine in a book this size is a huge task. Its intended audience is “every practitioner engaged in critical care medicine,” including medical students, residents, critical care physicians, nurses, and respiratory therapists. The book is 11.5×18×2.5 cm, and the outline form makes it easy to read. From the beginning the book seems primarily oriented toward medical students and physicians in training. The first chapter, “Approach to the Intensive Care Unit,” is good. The section on system-oriented rounds will be quite helpful for the student or resident rotating through the intensive care unit for the first time. The next chapter, “The Basics of Critical Care,” is problematic. The tachycardia algorithms are in the section on the alveolar air equation and are not well described. Primary ventricular fibrillation is not mentioned as a cause of sudden nontraumatic cardiac arrest (Table 2.1). Also, though admittedly the following are my own pet peeves, “ $F_{IO_2}$ ” is a *fraction*, not a percent, and “ $P_{CO_2}$ ” should be “ $P_{aCO_2}$ ” when describing the carbon dioxide level in arterial blood.

Parts of the section on mechanical ventilation are also confusing. “Oxygenation is accomplished in normal people by purposefully inspiring a certain  $F_{IO_2}$  and maintaining a certain positive end-expiratory pressure.” That sentence could be confusing to some readers. In Table 2.4 the ventilator Principle #3 is that patients do not “buck” or “fight” the *ventilator*: patients buck *ill-conceived ventilator settings*. That may not be true in this era of low-tidal-volume ventilation and pressure-controlled ventilation.

The chapter entitled “Cardiovascular Disorders” reviews most of the basics but is somewhat out of date because invasive cardiology has been rapidly evolving. Also, pericarditis is left out of the differential di-

agnosis for ischemic chest pain, alcohol is not in the differential diagnosis of cardiomyopathy, and neck vein elevation and Kussmaul’s sign are left out of the physical findings for cardiac tamponade as a complication of pericarditis. Finally, in the section on therapy for aortic stenosis the authors state that “valve replacement should be reserved as palliative therapy for patients who are poor surgical risks.” Undoubtedly they meant *valvuloplasty*; valve replacement per se is not mentioned and a neophyte should not be expected to figure this out. At the end of this and other chapters there are “useful facts and formulas” that are quite helpful.

Chapter 4, “Endocrinologic Disorders,” covers the basics. However, I think diabetic ketoacidosis and hyperosmolar nonketotic coma should be discussed separately, since their pathophysiology and management are somewhat different. Chapter 5, “Environmental Disorders,” is helpful for those who do not regularly deal with burns, heat stroke, smoke inhalation, and spider and snake bites. Because of the time lag between the writing of a book and its publication, Chapter 6, “Gastrointestinal Disorders,” does not mention proton pump inhibitors as a treatment for gastrointestinal bleeding; and the section on anticoagulation in Chapter 7, “Hematologic Disorders,” does not mention low-molecular-weight heparin therapy.

The remaining chapters contain quite a bit of very useful information. Again, compiling this much information in such a compact book was a huge undertaking. However in some instances the information is out of date and misleading and, in addition, there are important omissions and errors that temper my ability to recommend this book, especially for the first-time intensive care unit caregiver.

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**Evaluating Critical Care: Using Health Services Research to Improve Quality.** William J Sibbald MD and Julian F Bion MD, editors (Update in Intensive Care Medicine, Volume 35, Jean-Louis Vincent MD PhD, Series Editor). Berlin: Springer-Verlag. 2002. Soft cover, illustrated, 379 pages, €49.95, US \$50.

This text provides a comprehensive overview of key challenges in critical care research and practice today and offers potential solutions from the health services perspective. The book is inspired by the 2000 Brussels Roundtable Meeting of the same name and is part of the successful *Update in Intensive Care Medicine* series.

Drs Sibbald and Bion introduce the book by acknowledging the enormous achievements in critical care since its creation. They point out, however, that we have failed to translate promising basic science and physiologic research into improved clinical outcomes. They suggest that what may be missing in critical care is the broader approach offered by health services research (HSR)—an approach that integrates basic and clinical research, epidemiology, ethics and issues of organization, economics, delivery and access in order to improve quality of care. This idea is further defined and characterized by Dr Lomas in the second part of the introduction and throughout the rest of the text.

The book is divided into 3 sections. The first, “Methods of Measurement in Intensive Care,” consists of 6 chapters that together provide an outstanding overview of structure, process, and outcome of care in the intensive care unit (ICU). Dr Rubenfeld begins the section by defining ICU structure, reviewing pertinent literature (nicely summarized in Table 1), and detailing each component of ICU structure (material, human, organizational, and other resources). Dr Knaus continues on to process of care and process assessment (what is done, when, and how). He discusses the impact of ICU processes on outcomes, making note of methodologically sound studies that have revealed that what intensivists do can be harmful (eg, transfusions, pulmonary artery catheters). Both Drs Rubenfeld and Knaus conclude that structure and process impact care and outcome and must continue to be

investigated in rigorous, scientific ways. Dr Moreno completes the discussion of process assessment by providing a critical review of severity of illness scores. He clearly and concisely describes the most commonly used instruments (Acute Physiology and Chronic Health Evaluation, Simplified Acute Physiology Score, Mortality Probability Model, organ dysfunction scores, and disease-specific evaluation instruments) and summarizes the most important prognostic determinants for critically ill patients. An indispensable component of this chapter is Dr Moreno's comment on potential problems of inter-observer variability in scoring and the essence of training personnel and collecting the variables carefully. He also presents a nice discussion of the challenges of applying scores to individual patients or differing patient populations.

The next 3 chapters in the first section highlight ICU outcomes. Dr Marshall defines outcomes and their perspectives and spends most of his chapter on treatment-centered outcomes. His discussion of the limitations of survival as a primary outcome is quite thoughtful. He argues clearly why organ dysfunction may be a better outcome measure and provides information on methodological considerations behind the development of organ dysfunction scores. Drs Kutsogiannis and Noseworthy's chapter centers on an important outcome measure: quality of life (QOL). They provide a nice introduction to QOL, describing the 5 domains of health-related QOL measures and comparing generic versus specific instruments and cross-sectional versus longitudinal surveys. This is followed by a thorough review of the current literature on QOL during and following ICU stays. This chapter is one of the most detailed and is perhaps a bit more in-depth than necessary for the purposes of this textbook. Dr Ridley ends the first section by providing a general discussion of how to choose outcomes. He examines long-term outcomes of interest from the perspectives of the patient, family, ICU staff, and health managers, economists, and politicians. He provides a good overview of the challenges of using long-term survival as an outcome and ends by appraising non-mortality outcome measures in current use and why they may not be suitable for post-ICU patients.

The second section of the book, "Techniques for Acquiring Information," consists of 11 chapters that do not complement each other quite as well as the chapters in other

sections. Drs Zimmerman, Draper, and Wagner begin this section with an excellent synopsis of the history of severity-of-illness scores and the components of 3 of the most commonly used scores (Acute Physiology and Chronic Health Evaluation, Simplified Acute Physiology Score, and Mortality Probability Model). (This complements Dr Moreno's earlier chapter well.) They provide a detailed discussion of potential problems of each and suggest solutions.

Drs Hillman, Flabouris, and Parr then present the "medical emergency team" concept. The medical emergency team is a multidisciplinary health care team put into practice to identify, assess, and manage critically ill patients prior to ICU admission. Their medical emergency team experience serves as a reasonably good example of how to implement new concepts, change health care processes and carry out continuous quality improvement. However, this chapter is somewhat out of place in this section of the textbook.

Dr Miranda returns to the theme of the section by discussing funding and support. In regards to funding she emphasizes the necessity of external support, at least when first initiating HSR. She uses the example of the European Union and the European ICU studies and describes their budget in detail. Unfortunately, there is no discussion of how to search for and secure external sources of funding in other settings or of differing approaches to resource allocation. The support portion of the chapter is stronger, spotlighting the challenges of multidisciplinary and systems approaches.

There is a clearer flow across the rest of the section. Drs Angus and Pronovost supply one of the strongest chapters in the text. They succinctly summarize key design and statistical issues of clinical trials. They provide a comprehensive discussion of random and systematic errors, misclassification, sample size, use of standardized protocols, and how to choose the right outcome (which is well-described in Table 1). They also include brief but useful comments on observational studies. Drs Cook and Giacomini then address what to do once you have the results. They suggest that an HSR approach brings the best clinical evidence to patient care: this approach includes a review of available literature, comparisons with current practice, application of effective strategies for change, and then a re-evaluation of practice. An HSR program for preven-

tion of ventilator-associated pneumonia provides an effective example.

The next few chapters address critical assessment and application of available evidence as well as subsequent evaluation of benefits and outcomes. Dr Heyland provides an adequate review of the utility of meta-analyses and systematic reviews. Dr Bion gives a very good discussion of the utility of consensus methods when faced with unclear or conflicting data. The chapter includes a nice summary of the evidence of the influence of consensus method output on practice as well as critical commentary on the cons of consensus conferences. Drs Burchardi, Jegers, Goedee, and Leititis tackle the topic of costs as a means of assessing ICU efficiency and efficacy. A helpful list of definitions related to the topic is given at the start of the chapter. The authors argue that benchmarking studies between different health care systems are inherently flawed. They comment on approaches to measurement of direct costs and criteria that can be used for evaluation of cost studies. They conclude with a critique of 23 papers assessing ICU costs. As with Drs Kutsogiannis and Noseworthy's chapter, this is somewhat more in-depth than necessary for the purposes of this textbook.

The next 2 chapters deal with technology, which is a subject that often receives little attention, and I am impressed that it was included in this text. Dr Webb discusses why outcomes assessment for medical devices must differ from that of other interventions, describes appropriate outcomes (Table 2), and presents a practical approach to assessment of devices (including safety, efficacy, clinical utility, and cost). Dr Imhoff gives an excellent introduction to the current problem of data and information overload in the ICU, focusing on how health informatics may assist professionals in understanding, evaluating, managing, and controlling health care processes. The analogy of industry is used fairly effectively throughout the chapter to illustrate points. Finally, Dr Imhoff provides a very thorough review of the evidence supporting the impact of protocols, clinical pathways, electronic reminders, and computerized systems on processes of care.

The section concludes with Drs Vincent and Brimiouille's chapter on databases. This is a short but comprehensive and vital review of the common types of databases and problems that may limit their use and generalizability.

Six chapters compose the third and final section of the book, "Application and Interpretation: Using Data to Improve Outcomes." The section begins with an excellent review by Dr Hall of studies that have evaluated ICU organizational structure and its impact on outcomes. This is followed by Dr Thijs's detailed discussion of the impact of geographic differences on a variety of usual ICU outcomes. Drs Carlet, Montuclard, and Garrouste-Orgeas then address the problems involved in use of standardized mortality ratios (based on severity of illness scores) to assess quality of care in the ICU, and they provide valuable thoughts on how to apply data from studies of large groups to individuals.

The final 3 chapters focus on quality management in the ICU. Dr Frutiger discusses process changes that improve quality in the ICU and provides practical recommendations for setting up a quality control system in the ICU. Dr Ellrodt suggests how to choose problems to target for quality improvement and how to define the multidisciplinary team. Next he outlines preparatory issues the team will need to address, potential barriers to implementation of new programs, identification of a few key interventions on which to focus, grading of recommendations, development of a plan for action, dissemination, implementation (he gives very useful specific examples of several techniques), and evaluation/measurement strategy. Drs Sibbald and Webster's concluding chapter complements Ellrodt's well. They address some of the same issues but discuss formal theoretical change models and elaborate on change strategies found in the current medical and business literature. In addition, they include a nice expanded discussion of potential barriers and how to overcome them and sustain change.

In terms of the physical structure of the book, it is an easily readable, light paperback. There is a limited but sufficient abbreviation list at the start. The table of contents is satisfactory, though the chapters are not numbered and thus are a bit difficult to reference. The layout is similar in all of the chapters following the introductory section. Each chapter begins with 4–7 learning points. Fifteen chapters follow the learning points with case scenarios or examples, 4 chapters with relevant quotes, and 4 chapters with neither. The case scenarios/examples often illustrate the authors' aims well, and it would have been helpful to include these for every chapter. All the authors used

figures and tables judiciously; when included, these are appropriately referenced in the text, clearly labeled, and easy to understand. The reference lists appear to be quite complete and up-to-date. Grammatical and spelling errors are infrequent, though there are some: "There is a limited number of studies. . ." (page 25), ". . . in a sample of 40 hospitals, though to be representative" (page 53), "has repeatedly being used to. . ." (page 227), "loosing" instead of "losing" (page 156), and "were" instead of "where" (page 224). The index is somewhat limited, but adequate, and has only rare errors (eg, sickness impact profile domains are defined on page 107, but that fact is not referenced; efficacy is defined on page 223, not 222).

The editors have successfully produced a useful introductory overview of the utility of HSR in improving critical care outcomes. This is an informative, comprehensive, generally well-written, and readable text. There is a very small amount of redundancy in the content of some of the chapters, as may be expected in this type of summary textbook written by numerous authors (eg, Drs Hall and Thijs both discuss open and closed ICUs, Drs Sibbald and Webster and Dr Ellrodt address implementation of new evidence and barriers). But this redundancy is infrequent, and most of the time the chapters complement each other well. The contribution and collaboration of the 38 authors is ultimately one of the greatest strengths of this text. The book is incredibly enriched by the diversity and knowledge of this group of authors, most of whom are regarded as experts in some aspect of critical care and/or HSR. Furthermore, the contributors provide the text with a variety of international perspectives, from the United States, Canada, United Kingdom, Germany, Netherlands, and Australia, to name a few. Though the book is written by and primarily aimed at physicians, I believe that most of the content is general and broad enough that it would be of considerable interest and value to any type of health professional engaging in critical care clinical research or HSR. I recommend it to physicians, nurses, respiratory therapists, and research assistants beginning such work.

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**Critical Care Study Guide: Text and Review.** Gerard J Criner MD and Gilbert E D'Alonzo DO, editors. New York: Springer-Verlag. 2002. Soft cover, illustrated, 852 pages, \$69.95.

I began reading the **Critical Care Study Guide** with the intention of using it as a study tool for the Critical Care Certification Examination. In the preface the editors acknowledge the extensive knowledge base and clinical acumen required to practice critical care medicine, as well as its inherent complexity. They set out to provide not only an introductory reference but also a useful educational tool from which the reader can approach intensive care unit (ICU) patient care. To that end, several educational approaches are employed: clinical cases, margin notes, and review questions. The editors of this book emphasize the use of evidence-based literature, despite the contributions of many authors. While not explicitly stated, the intended readership seems to be the physician who is either new to the critical care arena or who enters it sporadically and wishes to review a particular topic germane to the care of critical care patients.

The book is a soft-cover, 852-page text divided into 3 parts. Part I contains 11 chapters dedicated to "Critical Care Procedures." It covers the range of topics from noninvasive to invasive hemodynamic monitoring, from enteral feeding tubes to endoscopy, and includes all commonly performed ICU procedures. Part II consists of 22 chapters on "Pathophysiologic Disease States Encountered in the Critically Ill Patient." Each chapter approaches one organ system dysfunction, one specific disease entity, or a spectrum of commonly encountered abnormalities, such as acid-base disorders. This section also includes chapters on nutrition, toxicology, trauma, and ethics. Part III addresses "Specific Treatments in the Critically Ill Patient." Fourteen chapters cover the range of cardiopulmonary-related treatments, dialysis, use of blood products and antibiotics, and prophylactic regimens. Finally, Part IV contains a drug index, with adult dosage recommendations and commonly used calculations in critical care medicine, including the Acute Physiology and Chronic Health Evaluation (APACHE II) patient-assessment tool.

Each chapter begins with a chapter outline and a list of learning objectives, which allow the reader to rapidly determine the chapter content. Margin notes summarize