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

key points from each section, providing a useful tool for the reader with limited time. Many tables and figures are included to illustrate pertinent anatomy, algorithms, devices, and physiologic relationships. Case studies are found primarily throughout the chapters in Part II, to illustrate commonly-encountered disease states and to highlight clinical relevancy. At the end of each chapter 3–10 review questions quiz the reader on the stated learning objectives. The questions are followed by the answers, with brief explanations. A brief list of suggested reading material is found at the end of each chapter.

Part I extensively covers critical care procedures. It begins with chapters on airway management, oxygenation, and blood gas sampling. I found the detailed "checklist before intubation" and the review of special situations of airway management particularly useful and thorough. A review of supplemental oxygen devices was also valuable. The chapter on hemodynamic monitoring reviews indications, contraindications, and techniques for arterial and venous cannulation, with photographs and diagrams that provide a useful reference for beginners. Much of the chapter is devoted to pulmonary artery catheterization and interpretation of measurements in various clinical situations. I found the organization somewhat confusing: the section titled "Management of Myocardial Infarction and Cardiogenic Shock" seems out of place in a procedural chapter. The chapter on cardiac pacing devices thoroughly describes pacemakers and defibrillators. Chapters on drainage tubes, feeding tubes, common procedures (thoracentesis, paracentesis, lumbar puncture, and pericardiocentesis), and endoscopy provide a straightforward and basic review. The last chapter in Part 1 provides an overview of radiologic imaging of ICU patients.

Part II begins with an overview of neurologic illness, followed by chapters on other specific organ dysfunction and topics such as sepsis, circulatory shock, thermoregulation, infections, toxicology, and trauma. In general these chapters briefly review a wide range of disorders, generally including a discussion of pathophysiology, diagnostic strategies, relevant imaging modalities, and treatment. The chapter on respiratory failure discusses the differences between hypercapnic and hypoxemic respiratory failure quite well; surprisingly, it fails to mention acute respiratory distress syndrome, a commonly encountered disease in ICU patients. The chapter on sepsis provides a concise review but fails to mention activated protein C (drotrecogin alfa), the newest therapeutic option for severe sepsis. Relevant formulas and normal values are reviewed in the chapter on oxygen content, delivery, and uptake. A table summarizing toxins and their antidotes provides a useful reference in the chapter on toxicology. Compartment syndrome, myocardial contusion, burn patient care, pulmonary thromboembolism, and massive transfusion complications are reviewed in the chapter on trauma.

Part III opens with chapters on mechanical ventilation, noninvasive ventilation, and weaning. Topics include principles and modes of mechanical ventilation, ventilator strategies, adjunctive therapies, monitoring, and complications. The chapter on dialysis describes all modalities of renal replacement, with helpful figures. Throughout the section the material is substantiated by references to the pertinent literature, which are included in the suggested reading lists at the ends of the chapters. The chapter on advanced cardiopulmonary resuscitation fails to mention the newer treatment options of amiodarone and vasopressin for ventricular fibrillation/pulseless ventricular tachycardia. The important issues of deep venous thrombosis prophylaxis, ulcer prophylaxis, and nosocomial infection prophylaxis are covered in Chapter 45.

As would be expected in such a lengthy text, there are a few minor typographical errors, including a textual reference to the wrong figure and obvious word substitutions (eg, on page 53, Table 4–3, "content" for "delivery"). I also found a seemingly inadvertent omission of information in Table 26–1 (page 421). More concerning were 2 important inaccuracies: one on page 12, in reference to the effect of head position on endotracheal tube position, and another on page 141, in which the discussion of rapid shallow breathing index is not consistent with the commonly used rapid shallow breathing index described by Yang and Tobin.[1] Several errors are evident in the review question-and-answer sections that would be particularly confusing to the reader trying to review and test her knowledge. On page 43, question 3 is, "In which of the following clinical situations will the A-a gradient be increased?" According to the answer given, the question should read, "In which of the following clinical situations will the A-a gradient be normal?" In another case (page 517, answer 4), the answer, "Patients are likely to be hypercoagulable. . ." should read, "Patients are likely to be coagulopathic. . .." In one case the incorrect letter answer is given (page 706, answer 9), but the explanation is correct. On page 706 the answers to questions 4 and 5 are transposed.

Overall, I found the **Critical Care Study Guide** a useful reference tool for the physician studying critical care medicine. It may be particularly useful to the student, resident, or hospitalist less experienced in the critical care arena. Its strength is the breadth of information covered in a concise, well-written, and readable manner. Critical care procedures are particularly well described, and the use of photographs, diagrams, and algorithms in these chapters is excellent. Although it is sometimes difficult to predict where specific information will be discussed (eg, a brief discussion of acute respiratory distress syndrome is found in the chapters on mechanical ventilation rather than the chapter on respiratory failure), a brief review of most critical care topics can be found. For the intensivist or critical care fellow this text provides an overview or review of a topic before that physician proceeds to a more detailed text or a literature search to answer a specific question. The editors have succeeded in creating a reference and an educational tool.

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REFERENCE

1. Yang KL, Tobin MJ. A prospective study of indexes predicting the outcome of trials of weaning from mechanical ventilation. N Engl J Med 1991;324(21):1445–1450.

Principles of Airway Management, 3rd edition. Brendan T Finucane MBBCh and Albert H Santora MD. New York: Springer-Verlag. 2003. Soft cover, illustrated, 503 pages, $59.95.

When offered the opportunity to review this book, I leapt at the chance. As an internist I had stood by enviously as my anesthesiologist colleague would unholster his laryngoscope and deftly intubate the trachea of my critically ill patient. I came to realize that I never wanted to be in the situation of having a patient suffer because I lacked ex-