

**Pharmacology and Pathophysiology of the Control of Breathing.** Denham S Ward, Albert Dahan, and Luc J Teppema, editors. *Lung Biology in Health and Disease*, volume 202, Claude Lenfant, executive editor. Boca Raton, Florida: Taylor & Francis. 2005. Hard cover, illustrated, 849 pages, \$199.95.

This multi-author book has an ambitious title that promises more than the book delivers. The title would lead one to assume that the monograph covers most aspects of the control of breathing and its abnormalities in disease states. Unfortunately, that is not the case, and the coverage is selective, both in the basic physiology and the pathophysiology of the control of breathing. On the other hand, there is much focus on the effects of anesthetics on ventilatory control.

Most of the chapters are reviews of the subject, but there are no new insights into ventilatory control mechanisms. The book would be useful for the beginning researcher, to provide a background and bibliography in selected areas of ventilatory control, and it may also be of interest for selective browsing by more experienced workers.

The list of authors includes some well known researchers, but, as with any monograph, some chapters emerge better than others. The book is divided into 3 subject groups: basic physiology of the control of breathing; pathophysiology of ventilatory control; and the pharmacology of ventilatory control.

The chapters in the first section, on the basic physiology of the control of breathing, do not do full justice to the subject, the most striking lacuna being an absence of any discussion of the mechanisms that integrate the various peripheral and central inputs that control breathing. For example, it would have been useful to review the roles of and interaction between peripheral and central chemoreceptors and modulation of ventilation by sensory feedback from the chest-wall and lung receptors. The first chapter, "Peripheral Chemoreceptors," by Nurse, is focused entirely on the carotid chemoreceptors, with no discussion of the neuroepithelial bodies or the aortic chemoreceptors. The discussion is almost entirely on oxygen-sensing mechanisms in the carotid chemo-

receptors, and there is an excellent discussion of the possible mechanisms of oxygen sensing in the carotid body. However, there is no discussion of the carotid chemoreceptor response to CO<sub>2</sub> or of the interaction of the responses to CO<sub>2</sub> and hypoxia. Nor is there any discussion of the effects of bilateral carotid-body denervation in man.

The chapter on central chemoreceptors, by Teppema and Dahan, is a useful overview of the subject, forming a good basic review for a researcher starting in this field. Behavioral, volitional control of breathing is discussed in Chapter 3, "Suprapontine Control of Breathing," by Moosavi et al, and the chapter reflects the concepts of the Harvard school of workers in this subject. It provides an excellent review of the current state of knowledge of the respiratory "centers" involved in volitional control of breathing. Elsewhere it suffers from being too basic, with important omissions: there is little discussion of the influence of peripheral chemical or mechanical sensory inputs on central perception, or of the role of diaphragm and airways sensory receptors, particularly an analysis of studies of chest-wall and airway denervation. The section on the perception of music is somewhat peripheral and speculative.

A highlight of this section is the chapter on respiratory neuroplasticity, by Fuller, Mitchell, and Bavis; this is a very good review of the subject and will be of great use to all workers in this field. On the other hand, the chapters (4 and 5) on drug effects are useful but do not adequately address the myriad possibilities posed by different drugs acting at various neuromuscular sites and affecting ventilatory regulation. The examples are aimed at drugs that depress respiration, primarily anesthetics. Other drugs that stimulate ventilation, such as doxapram and adenosine, are not discussed.

Chapter 7, on airway reflexes, by Nishino, fails to mention the possible role of the non-adrenergic noncholinergic fibers in airway control, nor is there an adequate discussion of the morphology of the airway neurons. This chapter would have benefited from a diagram of the various neurons and pathways.

The section on pathophysiology of ventilatory control is remarkable in what is omit-

ted rather than in what is included: there are no chapters on what are perhaps the commonest conditions associated with abnormalities of ventilatory control: chronic airways obstruction, asthma, pulmonary edema, and the fibrotic lung diseases. On the other hand, congenital hypoventilation syndrome, obesity, sleep apnea, and one physiologic condition (high-altitude hypoxia) receive separate chapters.

The chapters are of variable interest. Chapter 9, by Gozal, on the congenital hypoventilation syndrome, provides a good review of the subject, but the rarity of the condition makes it of limited interest.

Chapter 10, on upper-airway obstruction in sleep apnea, is a detailed and useful review of the subject, but it is limited to obstructive sleep apnea. It would have been of greater interest to include a more detailed review of ventilatory control during sleep.

Chapter 11, on high altitude, is a basic review of the subject, but offers no new insights into the response to high-altitude hypoxia.

The pharmacology section is almost entirely limited to the effects of anesthetic agents on ventilatory control, so it will be of special interest to anesthesiologists. Though many of the chapters provide useful information to the nonanesthesiologist (particularly Chapter 14, on the effects of sedatives), overall this section is only of specialized interest.

The figures included with the discussions are of uniformly high quality and appropriate, and each chapter has an extensive bibliography, though one could argue in some cases on inclusions and omissions.

In summary, this is a useful book to have on the bookshelf, though recognizing that its coverage of the subject is limited in many respects, and most chapters provide only a basic review. However, there are useful overviews in some subtopics of respiratory control, and selective dipping into the relevant chapters would be a very good introduction for the beginning researcher.

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**Acute and Chronic Cough.** Anthony E Redington and Alyn H Morice, editors. *Lung Biology in Health and Disease*, volume 205, Claude Lenfant, executive editor. Boca Raton, Florida: Taylor & Francis. 2005. Hard cover, illustrated, 434 pages, \$199.95.

A few weeks ago I developed an upper-respiratory-tract infection. It began, typically enough, with the sniffles, but within a couple of days had developed into a dry, irritating cough. It was a particularly nasty one, probably due to a rhinovirus—not that I, my family, or work colleagues cared, as I proceeded to cough persistently day and night. However, it did prompt the necessary action required for me to write this review, and it reminded me just what a disruptive and annoying symptom such a cough can be. Thankfully, the cough settled down after about a week, as most do, but it left me with the thought, “What if it hadn’t?” How would I manage with the disrupted sleep? What if I suffered constant coughing during my clinical ward rounds and out-patient consultations, or when teaching medical students, or taking a night off and going to the cinema? Suffice to say, persistent and seemingly purposeless cough is associated with considerable morbidity and impaired quality of life. Anyway, enough about me, and on with the review! Coughing is the most instantly and widely recognized airway maneuver, yet, paradoxically, it is probably the least well understood. In the last 50 years there have been notable advances in understanding the basic science and clinical aspects of cough, and many of the authors of chapters within this textbook contributed to those advances. Currently, scientific and clinical research into cough is a fluid and fast-moving topic, so I believe this is a good time to take stock of what has gone before, carefully evaluate current observations, and plan future scientific, clinical, and treatment strategies. Therefore any book that sets out to do this, as the editors suggest in their preface, is most welcome.

**Acute and Chronic Cough** is part of the *Lung Biology in Health and Disease* series. I congratulate the editors on assembling an international field of true experts in the many clinical and scientific aspects of cough. Like cough and cramp, clinicians and scientists can be uncomfortable bedfellows, and ensuring that a text written by both scientists and clini-

cians is balanced, interesting, and valuable to readers from both disciplines and to those from neither is quite a task.

The book comprises a staggering and brain-crunching 23 chapters, laid out into 4 sections, beginning with the basic science of the cough reflex, followed by the pharmacology of cough, then a series of chapters on experimental methodologies for the clinical and research evaluation of cough, and finally a section on the clinical aspects of acute and chronic cough. This organization may only be apparent to those who read the book’s preface, and I believe these 4 sections should have been more obviously identified within the contents section and throughout the book.

The first section, on the basic science of cough, begins rather abruptly, and each chapter is composed of fairly dense text, which at times (at least for the nonscientist) could make for difficult digestion. However, the chapters are well written, contemporaneous, and only occasionally let down by the quality and cramped appearance of some of the figures. Examples of this include Figures 1 and 3 in the first chapter, which would have benefited from being bigger, and Figure 3 would have been more helpful if printed in color. The fascinating immunohistochemistry slides (Figures 1, 2, and 4) in Chapter 2 were not reproduced terribly well, which is a pity. My final comment regarding this section relates to Chapter 5, which covers angiotensin-converting-enzyme-inhibitor-induced cough, a topic that has been a challenge to elucidate scientifically (a mind-boggling 159 references in this chapter alone), but less of a problem clinically (just stop the drug and use an alternative agent). The discontinuity between the pathophysiology of cough in animals and in man is made obvious in this chapter, and it serves as the perfect place from which to begin the second section on the pharmacology of cough.

Although there is some overlap, Chapter 6 focuses largely on the evidence for the vanilloid receptor and acid-sensing ion channels as possible cough receptors, whereas Chapter 7 reviews a large number of other ion channels and G-protein-coupled receptors. These are both well-written chapters, although Chapter 6 would have benefited from an illustration, and Chapter 7 has possibly been hindered by its Figure 1, which is too small and indistinct. Two key themes emerge from these chapters: the need to identify the endogenous ligands for these recep-

tors, and the lack of consistency of treatment effect seen thus far with new drugs on translation from animal studies into humans.

The penultimate section deals with existing and emerging methods of cough assessment. Chapter 8, “Analysis of the Cough Sound,” should be dedicated to all those who have devoted substantial portions of their work lives to cough-sound analysis! This chapter highlights the many obstacles that impede development of what would be the holy grail of cough evaluation, namely, a reliable and accurate ambulatory cough recorder. Arguably, the next 3 chapters (Chapters 9, 10, and 11) could have been condensed into one. Though each cough-provoking agent and method of delivery has its own merits, there is an overwhelming need to bring some standardization to this important topic of cough research. Each chapter has been carefully compiled, offering practical advice that should be of value for those interested in setting up cough laboratories.

The final section deals with the clinical aspects of acute and chronic cough. Chapter 12 opens with an interesting insight into the seasonality and economic costs of acute cough. It also provides a useful review of currently available therapies, the benefits of which rely in no small part on the placebo effect. The focus of Chapter 12 is on acute cough associated with the common cold, with little reference to bacterial infection (including pertussis) or acute cough in a smoker with worrying symptoms, such as blood in the sputum.

The subsequent 4 chapters deal with the evaluation and management of chronic cough in the adult. There is a practical review of the literature, which provides the rationale for a systematic approach to clinical management, and each of the “big 3” of cough (asthma/eosinophilic syndromes, gastroesophageal reflux disease, and upper-airway disease) are covered in detail in separate chapters. Much of the seminal work on the association between the gut and the airway in humans is summarized in Chapter 14. Even with the very best efforts, it is impossible for a textbook to remain up to date, and emerging topics of interest in cough, including laryngopharyngeal reflux and nonacid or volume reflux, are only briefly mentioned.

Following on from the most common causes of cough, Chapter 19 is devoted to psychogenic cough, a condition that is al-

most never encountered among adults and very occasionally among children with chronic cough. Although very readable, this chapter loses focus and extends into topics such as factitious sneezing, globus hystericus, and vocal-cord dysfunction. It would have been preferable briefly to mention this rare condition elsewhere, perhaps in a chapter dedicated to other causes of cough. Such a chapter is missing from this book, but should have included idiopathic cough, lung cancer, and pulmonary fibrosis—all conditions in which achieving adequate control of cough is a substantial clinical challenge.

The next 3 chapters are very good; they cover cough-reflex sensitivity in health and disease, cough and gender, and the impact of cough on health status. However, they do seem a little out of place in this section; in particular, Chapter 20 would have been better placed as a link between the earlier chapters on the neurophysiology and pharmacology of cough. The final chapter is an excellent overview of chronic cough in children. What particularly appealed to me was the section that highlights the major conceptual differences between children and adults with chronic cough.

On a final note, I searched the entire textbook and did not find a definition of cough! I left this comment to the end because I believed that somewhere in the book I would find a definition that would satisfy the scientist, the physician, the interested student, and the worried patient. Alas, none was to be found, so perhaps such a definition does not exist.

In summary, this book accurately reviewed most of the existing literature, presented practical approaches to the clinical evaluation of cough, and highlighted future topics for scientific focus. I believe this book has achieved much that it set out to do, and I thoroughly recommend it to all who have a clinical and scientific interest in this common yet complex symptom.

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**Severe Pneumonia.** Michael S Niederman, editor. *Lung Biology in Health and Disease*, volume 206, Claude Lenfant, executive editor. Boca Raton, Florida: Taylor & Francis. 2005. Hard cover, illustrated, 422 pages, \$199.95.

Volume 206 of the *Lung Biology in Health and Disease* series reviews the clinical, microbiologic, pathogenetic, and treatment issues related to severe pneumonia. Pneumonia remains the number one cause of death from infectious diseases in the United States, and the severe form of the disease is associated with high mortality (21.7–57.3%), extensive use of resources, and substantial health-care costs. This book aims to provide readers with a better appreciation and understanding of this clinical problem, to improve the management and prevention of severe pneumonia. Niederman assembled 31 contributing authors from all parts of the world to review the pathogenesis, clinical definition, microbiology, prognostic scoring systems, role of mechanical ventilation, diagnosis, empirical treatment options, and antibiotic-optimization issues relevant to severe pneumonia. The diversity of the contributors provides perspective on how this problem is approached worldwide. The book is intended primarily for physicians and physicians-in-training who care for patients with pneumonia. The book consists of 15 chapters, 9 of which focus on ventilator-associated pneumonia (VAP).

The first chapter deals with the definition of pneumonia severity, which is influenced by the intricacies of the host-pathogen interaction. The author emphasizes the current limitations of definitions for severe pneumonia and the evolutionary nature of the disease, which hinder predictive models that are based on an evaluation at one point in time. The initial definition of severe community-acquired pneumonia was based simply on need for admission to an intensive care unit (ICU), but this does not provide an objective definition, because it is controlled by subjective opinions and local practices. The Pneumonia Severity Index, modified British Thoracic Society rules (CURB65 [confusion, urea nitrogen, respiratory rate, blood pressure,  $\geq 65$  years of age]) and the American Thoracic Society criteria are reviewed, and the author concludes that the modified American Thoracic Society rules provide the best currently available criteria for the definition of severe pneumonia, but

that these are not infallible and should be used with sound clinical judgment.

Along the same theme, the 4th chapter addresses the issue of using the above criteria as predictive models for severe illness and mortality, and the author discusses whether these criteria could be used to improve pneumonia outcomes. The prediction models are presented in table form and compare the operating characteristics in predicting ICU admission, mechanical ventilation, medical complications, and death, using the Pneumonia Patient Outcomes Research Team (PORT) patient cohort. The various criteria are compared, in table form, with respect to practical issues in implementation, such as the need for laboratory results and number of variables assessed. This is helpful information for any practitioner trying to improve his or her medical practice by using a practical, easy-to-apply, applicable, and validated prediction model. Clearly, illness severity in community-acquired pneumonia can be predicted, but it is not yet clear whether this can be translated into improved patient outcomes. Ultimately the author concludes that clinical acumen remains important in managing patients with community-acquired pneumonia.

The 2nd chapter explores the issue of why some patients develop severe pneumonia. The chapter discusses the potential roles of microbial virulence factors, patient comorbidities, age, alcohol use, ethnic differences, and host genetic factors such as polymorphisms of immunoglobulin receptors and variations in tumor-necrosis-factor secretion. The different distribution of pathogens in severe community-acquired pneumonia is discussed at length, and the Spanish authors of this chapter review the important facts about each of the major pathogens involved, including *Streptococcus pneumoniae*, *Legionella pneumophila*, Gram-negative enteric bacilli, and *Staphylococcus aureus*. Notably, in multiple studies, despite extensive diagnostic evaluations, a pathogen is not isolated in 50–60% of cases. Differing bacteriology in specific risk groups is also reviewed, including the elderly, alcoholics, people with human immunodeficiency virus, and nursing-home residents. This chapter also reviews the need for early adequate empirical therapy to cover the most likely pathogens, and it examines the recommendations of the various international pulmonary and infectious-disease societies. Two key factors that affect pneumonia outcomes are emphasized: adequate initial ther-

apy, and the timing of initial therapy. Importantly, the trials (both positive and negative) that have looked at outcomes in patients who received guideline-based therapy are reviewed, as are studies on the impact of pneumococcal resistance on pneumococcal community-acquired pneumonia outcome. Mortality from bacteremic pneumococcal pneumonia has not improved significantly over the last 3 decades, and the authors review data that suggest that single-agent effective therapy is associated with worse outcomes, and that addition of a macrolide to a  $\beta$  lactam improves outcomes. The controversial topic of fluoroquinolone monotherapy in severe pneumonia is reviewed, and the authors conclude, based on recent data, that this treatment option is possible unless there are specific risk factors for *Pseudomonas*.

Most of the book deals with clinical issues and clinical research, but there is also a chapter on pulmonary defense mechanisms, including pathogen recognition, neutrophil recruitment and function, and factors that regulate the inflammatory response to prevent systemic injury. Clinical trials of granulocyte-colony-stimulating factor in humans with pneumonia are reviewed, and the authors conclude that, though no current anti-inflammatory or immunomodulatory therapies are approved for pneumonia, the current situation of increasing antibiotic resistance and the dearth of new antimicrobials in development necessitate novel approaches for the prevention and treatment of this problem.

A significant portion of the book (9 chapters) examines the relationship between mechanical ventilation and severe pneumonia. The effectiveness of noninvasive ventilation in preventing nosocomial pneumonia and the mortality benefit of noninvasive ventilation is reviewed, as is its use as a weaning strategy in patients with chronic obstructive pulmonary disease. The authors discuss their experience with a new noninvasive-ventilation helmet that has better patient tolerability than other noninvasive-ventilation systems.

VAP pathogenesis is depicted in flow diagrams and figures, and evidence-based strategies to reduce VAP risk are discussed, contrasting recommendations from various experts. An additional chapter is devoted to VAP prevention, and selective decontamination of the gastrointestinal tract is dealt with in more detail here. This well-written chapter includes a summary of its recommendations in a 3-page table.

Fagon and Chastre are co-authors of the chapter on the attributable mortality of VAP. This is a controversial topic that is difficult to study because of the multiple confounding factors present in ICU populations, and some studies have not shown a higher death rate attributable to pulmonary infection. The authors approached this topic by reviewing ICU mortality in different groups of critically ill patients and published multivariate analyses that partially elucidate the relationship between pneumonia and the likelihood of death. They discuss the existing case-control studies and interventional studies in VAP-prevention, to build their case for the attributable mortality of VAP. The chapter concludes with a review of the mortality predictors in VAP patients, and the authors emphasize that the modifiable prognostic factors are (1) a strategy of getting rapid and accurate bacteriologic information and (2) reducing unnecessary antibiotic usage, guided by a bronchoscopic diagnostic technique.

Niederman tackles the issue of a clinical versus bacteriologic approach to the diagnosis of VAP, with the background common goals of avoiding under-treating or inadequately treating patients with pneumonia, balanced by avoiding over-use of antibiotics and the resultant antimicrobial resistance. He makes the point that the strategy chosen needs to be applicable to a practitioner's local hospital environment. The chapter reviews the utility of the Clinical Pulmonary Infection Score as a diagnostic aid and as a strategy to refine clinical management, and there is a useful figure that summarizes the clinical approach. The author discusses his view of the limitations of the bacteriologic approach, including microbial-growth-threshold cutoffs and the reproducibility and variability of the technique. His primary concern appears to be the possible delay in initiation of therapy using this approach and the known risk of inadequate or delayed appropriate antimicrobial therapy, as well as the randomized trials that have not shown benefit from an invasive diagnostic technique.

In the next chapter, Chastre and Fagon provide their argument for an invasive approach to the diagnosis of VAP. They believe the invasive strategy helps direct the initial antibiotic therapy and also confirms the diagnosis, which increases the physician's confidence. They cite articles that found that this approach identifies a significant portion of patients who require changes

in their antibiotic regimen and it identifies patients receiving inadequate therapy, which is a risk factor for mortality. In addition, they think this strategy can reduce excessive antibiotic use and limit the emergence of drug-resistant bacterial strains, reduce overall costs (despite the additional cost of bronchoscopy), and identify patients who have infections elsewhere when the bronchoscopy fails to reveal pneumonia as the source of the patient's deterioration. They think a bronchoscopic strategy is superior to a clinical strategy, and they do not withhold antibiotics pending bronchoscopy in patients who are deteriorating. The chapter also includes a description of the procedure, complications, and specimen laboratory methods.

Chapter 10 is a very extensive review of the myriad mechanisms of antimicrobial resistance in the ICU; the chapter concentrates on the various resistance mechanisms used by different bacteria species.

The important chapter on empirical therapy of VAP is well organized; it emphasizes appropriate initial therapy, reviews pathogen-specific options for therapy, and presents an approach to foster de-escalation of therapy, concentrating on the patient's clinical response (as measured by changes in the Clinical Pulmonary Infection Score and culture data) to shorten the duration of therapy. This chapter is followed by a short review of the role of microbiological surveillance strategies to improve patient care in the ICU.

Overall, this book is an in-depth review of the issues and controversies involved in caring for patients with severe pneumonia. It certainly left me with a better appreciation of many of these issues. The book also reviews the impact of the pivotal clinical trials that have changed the way we practice. The book is well organized and the authors present their individual views convincingly, using an evidence-based approach. There is some repetition, but that is the nature of a book of reviews from multiple authors, and it can also add to the reading experience by providing different perspectives on issues. The book is very detailed, and the extensive references provided will serve as an excellent resource for me in the future, be it in educating students, guiding medical decisions in the ICU, or thinking on how best to design effective clinical trials.

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**Sleep Medicine: A Guide to Sleep and Its Disorders**, 2nd edition. John M Shneerson MA DM FRCP. Oxford, United Kingdom: Blackwell Publishing, 2005. Hard cover, illustrated, 325 pages, \$125.

Sleep medicine is a multidisciplinary medical specialty, newly recognized by the American Board of Medical Specialties. Physicians practicing sleep medicine have backgrounds in many fields, including pulmonary medicine, internal medicine, neurology, and psychiatry. Sleep disorders afflict many people and many remain undiagnosed because of lack of clinical recognition of the more than 90 sleep diagnoses. Physicians play a critical role in recognizing sleep disorders and play a key management role in their diagnosis and treatment. Respiratory therapists and polysomnographic technologists also play key roles in diagnosing many sleep disorders, especially sleep-disordered breathing. Respiratory therapists are instrumental in providing therapy for many sleep disorders, by providing nasal continuous positive airway pressure, bi-level positive airway pressure, nocturnal ventilation, and oxygen therapy to patients with sleep-disordered breathing. Because sleep medicine crosses many medical specialties and is a rapidly changing field, it is a challenge to remain up to date, but Shneerson provides a relatively up-to-date, concise review of sleep medicine and its more than 90 sleep disorders. Since he is the sole author, the book suffers less interchapter repetition than do multi-author books. The book is divided into 12 chapters. The first chapter deals with normal sleep and sleep development. It examines sleep throughout our life cycle and provides a backbone for further discussion in the second chapter, which concerns physiology and control of sleep. The third chapter, "Assessment of Sleep Disorders," provides a short review of various diagnostic techniques used in sleep medicine. The fourth chapter discusses how drugs impact sleep, including drugs used to treat sleep disorders and the adverse effects of some drugs on sleep. The remainder of the book (Chapters 5 through 12) discusses the many sleep disorders. The book presents the disorders more from a symptomatic standpoint than from a specific disease standpoint. This is appropriate, since patients present with symptoms, not diseases.

Chapter 5 examines circadian rhythm disorders. Chapter 6 examines disorders asso-

ciated with excessive daytime sleepiness. Chapter 7 discusses the complex and often perplexing topic of insomnia. Chapter 8 discusses dreams and nightmares, causes and treatments. Chapter 9 discusses motor disorders, including the parasomnias (motor activities such as sleepwalking, sleep talking, and rapid-eye-movement sleep-behavior disorder). Chapter 10 covers obstructive sleep apnea, which has received much press lately. Chapter 11 discusses central sleep apnea and hypoventilation. The final chapter examines medical disorders and how they can impact sleep. There are 10 appendixes, among which are validated questionnaires that are very useful in the practice of sleep medicine.

The author's key audience is physicians, including sleep specialists, pulmonologists (respirologists), neurologists, psychiatrists, and general/internal medicine physicians who evaluate patients with sleep disorders. Pediatric aspects of sleep are integrated throughout the text, so pediatricians may or may not find this book useful. Although not specifically written for respiratory therapists or nurses, the book may be helpful as a reference. Since this book does not go into detail concerning polysomnography, it is probably not useful for polysomnographic technologists who want specific technical information.

Shneerson is from the United Kingdom and has a fine command of syntax and grammar. He provides clear explanations for very complex topics. It is easy to follow his thought processes, because the writing is very clear, concise, and readable. This is a book that you could sit down and read cover to cover. It is not intended to be a reference book on sleep disorders, so it is not heavily referenced, but it provides limited references after each chapter.

It is up to date, as evidenced by references to the most recent International Classification of Diseases for sleep disorders. Furthermore, Chapter 4, "Drugs and Sleep," discusses medications recently released by the U.S. Food and Drug Administration, including pregabalin, ramelteon, and eszopiclone. I think the book's illustrations will be especially helpful for understanding sleep/wake mechanisms and pathophysiologic aspects of many sleep disorders, including obstructive sleep apnea and central sleep apnea. The author effectively uses tables to describe the differential diagnoses of sleep-related symptoms and differentiate sleep disorders that present with common symptoms. One

example is in Chapter 7, "Insomnia," which examines the various hyperarousable states that can lead to insomnia.

In general, the material is well selected and organized. I am most impressed with the author's ability to present complex topics and concepts in a naturally flowing, easily understood narrative. This is particularly evident in the chapter on the physiologic basis of sleep and wakefulness. Furthermore, the presentation on drugs and sleep is outstanding. It describes drug effects on sleep stages and the circadian rhythm, and discusses pharmacokinetic aspects of specific medications and mechanisms of action. Very few books have examined drugs and sleep in such a concise and well-done manner.

Another outstanding aspect of this book is Chapter 9, "Motor Disorders," which discusses parasomnias, including sleepwalking, sleep terrors, arousal disorders, hypnic jerks, epilepsy, chorea, and tics. For the non-neurologist this section is especially helpful. The statements, in general, are accurate, although sometimes they are simplified for clarity.

This book includes only an introduction to polysomnographic methods; it would not be adequate for physicians, respiratory therapists, or sleep technologists seeking to gain expertise in polysomnography. Limited information is provided on sleep-stage scoring and technical aspects of polysomnography, which is covered in only 14 pages. The diagnostic criteria used in the United States are not included. For instance, sleep-disordered breathing in the United Kingdom is often diagnosed without the use of polysomnography. Practice parameters recommended by the American Academy of Sleep Medicine are not described. One example is the diagnosis of narcolepsy. Though the information presented is accurate, different countries have different diagnostic and treatment paradigms for sleep disorders, and this book provides the United Kingdom perspective.

An outstanding feature of the book is the extensive descriptions of differential diagnoses of symptoms for many sleep disorders. Chapter 6, "Excessive Daytime Sleepiness," discusses not only sleep deprivation and its effects, but also other disorders and how they present throughout the life cycle. It gives a *complete* differential diagnosis, as evidenced by the inclusion of narcolepsy, upper-airway-resistance syndrome, disorders of the pons

and mid-brain, disorders of the hypothalamus, Kleine-Levin syndrome, Prader-Willi syndrome, diffuse organic neurologic disorders, and rare disorders such as African sleeping sickness. The author also lucidly describes the disease processes of common disorders such as Parkinson's disease, and how the disease impacts sleep. This aspect of the book would be highly useful to a respiratory therapist to provide optimal care of patients with secondary sleep disorders that arise from neurologic diseases and other medical disorders. This section also includes a nice description of how sleep can influence respiratory conditions, including asthma, chronic bronchitis, chronic obstructive pulmonary disease, cystic fibrosis, and parenchymal lung diseases.

The book is very well organized from a topical standpoint, though sometimes the subheadings and the subsubheadings are difficult to distinguish from each other. The subsubheadings are in italics, which I think readers will find helpful, especially in the chapter on motor disorders, where it is not always clear whether clinical features are specific for one disease or many. The references are up to date into 2005. An example is in the first chapter's review of the classification of sleep disorders, which was released in April of 2005. The index is carefully cross-indexed, which makes it very easy to find a diagnosis or symptom and find the appropriate material in the text.

In conclusion, **Sleep Medicine: A Guide to Sleep and Its Disorders** is an up-to-date, easy-to-read, well-organized text that examines sleep and wake mechanisms and frequent presenting symptoms of sleep disorders. It will serve as a reference for respiratory therapists, especially when patients with different sleep disorders come to the laboratory for evaluation. Although it does not focus on the technical aspects of sleep medicine, it does provide an easy-to-understand introduction to the spectrum of sleep disorders.

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**Cystic Fibrosis in the 21st Century.** Andrew Bush, Eric WFW Alton, Jane C Davies, Uta Griesenbach, Adam Jaffe, editors. *Progress in Respiratory Research*, volume 34, CT Bolliger, series editor. Basel, Switzerland: S Karger. 2006. Hard cover, illustrated, 329 pages, \$180.

This is an imperiously named textbook, considering that the 21st Century was only 4 years old when these chapters were written. But once you get past that hyperbole and into the book, you will find it beautifully written and well organized. Many of the world's experts have been brought together to produce this superb reference.

There are 40 short and well-referenced chapters, which cover all aspects of the science and clinical care of the patient with cystic fibrosis. Each chapter provides a concise and up-to-date review. However, only Chapter 38 has direct clinical relevance to the practice of respiratory care. That chapter is a "must-read" for all respiratory therapists who care for patients with cystic fibrosis.

The book is well illustrated and comprehensive. The first half of the book will be a hard slog for readers who are not basic scientists. Unfortunately, some of the clinical chapters are not quite as up to date or accurate as is the basic-science half of the book. As an example, Chapter 23, on lung transplantation, has a number of inaccuracies in its explanation of the pathogenesis of cystic fibrosis lung disease. This book best serves as a reference text. The research directions are stated clearly, and for the most part the clinical recommendations are sound and evidence-based. This book is an outstanding reference for scientists and will be of interest to physicians who care for patients with cystic fibrosis, but it will be of passing interest for respiratory therapists who primarily provide clinical care for persons with cystic fibrosis.

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**Lung Surfactant Function and Disorder.** Kaushik Nag, editor. *Lung Biology in Health and Disease*, volume 201, Claude Lenfant, executive editor. Boca Raton, Florida: Taylor & Francis. 2005. Hard cover, illustrated, 493 pages, \$199.95.

Volume 201 of the *Lung Biology in Health and Disease* series is devoted to lung surfactant function and disorder. It covers all major areas of research about lung surfactant, including chemistry, biochemistry, physics, genetics, computer science, physiology, and medicine. The book has 19 chapters and 3 parts. Each chapter is written by several well-known investigators, and the authors hail from many parts of the world.

Part 1 consists of chapters on the composition, structure, and function of lung surfactant. Surfactant phospholipids composition in children changes both with postnatal development and with disease. The first part of Chapter 1 describes surfactant phospholipids molecular species in adult lungs, and during fetal and postnatal development. The last part of this chapter discusses modification of surfactant phospholipids molecular species in various lung diseases. Chapter 2 discusses surfactant composition, synthesis, and secretion. This chapter emphasizes how temperature regulates the biophysical properties of surfactant and discusses in detail the factors that regulate secretion of surfactant, such as ventilation, phorbol esters, vasopressin, lipoproteins, and adrenergic and cholinergic agonists. Both Chapters 1 and 2 are valuable for learning the basics of surfactant.

The next 2 chapters are dedicated to hydrophilic surfactant proteins, surfactant proteins A and D. The discussion covers detailed structure, tissue distribution, and function of these proteins in the context of other structurally related proteins such as mannose-binding lectin and the first component of complement C1q. There is specific emphasis on various domains of these proteins, which, after binding to surfactant and microbial membranes and alveolar and inflammatory cells, perform different functions, ranging from protection against alveolar collapse to innate host defense. Several receptors and/or binding proteins for surfactant proteins A and D are also discussed.

Chapter 5 addresses the importance of hydrophobic surfactant proteins B and C: their evolutionary origin, biological and clinical importance, and structure-function relationships. All 3 chapters on surfactant pro-

teins are focused and well-written, although they could be shortened by combining the receptor sections of Chapters 3 and 4, as both these proteins share several receptors.

Part 2 has 9 chapters, the first 5 of which are devoted to the biophysics and molecular mechanisms of surfactant, with emphasis on biochemical and biophysical analysis of surfactant with modern technology. There is a description of computer-simulation methods to study lipid monolayers. These chapters will be valuable for biochemistry and biophysics researchers. However, the legends of some of the figures in these chapters are too brief, and abbreviations in the figures are not defined in the figure legends, which makes it difficult to get the message from the figure without reading the related chapter text.

The next 4 chapters of Part 2 focus on the synthesis, structure, and function of surfactant proteins B and C, studied using transgenic and gene-targeted mice. These very informative chapters describe the role of surfactant proteins B and C in the structure and function relationship of pulmonary surfactant. However, the reason these chapters are included in Part 2 is not clear to me. At least some of these chapters (eg, Chapters 13 and 14) could have provided better flow in the subject matter if included after Chapter 5 in Part 1, which discusses the biological and clinical importance of surfactant proteins B and C, after addressing structural and functional properties of surfactant proteins A and D in previous chapters. I also found several aspects of the figures in this section inadequately described in their legends.

The third and last part of this book is made up of 5 chapters devoted to various conditions associated with surfactant dysfunction. The first 3 of these chapters describe the role of lung surfactant in acute

lung injury (ALI), asthma, allergy, and inflammatory lung diseases. Chapter 15 focuses on ALI and is very well written, except that on page 364, the alterations in the metabolism and functions of pulmonary surfactant recovered from patients with ALI are not presented with clarity. The changes in various parameters during ALI presented in the table on page 364 are correlated with the schematic in Figure 15.2, the legend for which lacks adequate details. Chapter 16 focuses on surfactant alterations in asthma and modulation of various immune-cell functions in allergic inflammation. The chapter also suggests therapeutic use of surfactant in asthma. This chapter is informative and will be valuable for both physicians and researchers.

The next chapter addresses the use of surfactant in inflammatory lung disease. The writing and editing of this chapter were poor. For example, the last line of the introduction indicates that the role of surfactant in allergic lung disease is reviewed in Chapter 9, but Chapter 9 addresses surfactant molecular perspectives from computer simulation studies; the role of surfactant in asthma and allergy is covered in Chapter 16. This mistake was repeated on line 1 of page 415. Also, on page 407 it incorrectly states that Chapters 5 and 15 review the role of surfactant proteins A and D in agglutination and presentation of bacterial, fungal, or viral antigens, and in the control of the immune-defense system; those chapters actually address structure-function relationships of surfactant proteins B and C and the physiological importance of surfactant dysfunction in ALI. Furthermore, page 412 describes a study that investigated effects of surfactant therapy on oxygenation in "infants" age 1 month to 13 years. Pre-

sumably the authors meant "infants and children."

Chapter 18 discusses alterations in lung-surfactant function caused by reactive oxygen species. This chapter is well-organized. It describes the sources of reactive oxygen species in the lung, the enzymatic and non-enzymatic antioxidant defense mechanisms in the lung, the biochemical and biophysical changes caused by reactive oxygen species in surfactant, and the pathological processes associated with these changes. The writing style is friendly, and I think this chapter will be valuable to both researchers and physicians interested in lung physiology and pathology.

The final chapter is directed mainly toward physicians, but researchers can equally benefit from it. It focuses on surfactant therapy in various disease conditions, such as the neonatal and adult respiratory distress syndromes. The chapter stresses the mechanism of action and toxicity of herbal oil surfactants, which in developing countries may be a treatment of choice for neonatal respiratory distress syndrome. The chapter also addresses interactions of surfactant with environmental pollutants, the status of surfactant in pulmonary tuberculosis, and improved delivery of surfactant preparations to the lung.

In summary, the book is comprehensive and covers all major areas of surfactant study, but some of the chapters are poorly edited, and the overall organization of some chapters is loose. For example, not all the chapters include summaries and descriptions of future research directions. The problems with organization and editing overshadow some of the text's good points.

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