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 β 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 withold 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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