

method, or body plethysmography. The chapter addresses acceptability criteria for the various measurement strategies, pathophysiology, and interpretation of the results. This chapter also discusses gas distribution tests and variables, such as the single-breath nitrogen washout, closing volume, and closing capacity.

In Chapter 4 Ruppel discusses measurement of ventilation and its components. Techniques are described for estimating dead space, alveolar ventilation, and ventilatory responses to carbon dioxide and oxygen.

Chapter 5 describes measurement of diffusion capacity in the lungs. The majority of the chapter deals with the most common method of measuring diffusing capacity, which is the single-breath or breath-hold technique. As in the previous chapters, recommendations, interpretations, and case studies are provided.

Chapter 6 explores arterial blood gas analysis. The technical aspects of obtaining blood samples are discussed in detail. Two noninvasive methods of assessing gas exchange are also discussed: pulse oximetry and capnography. Shunt measurements, which estimate the severity of ventilation-perfusion imbalance in the lung, are also addressed.

Chapter 7, which introduces cardiopulmonary exercise testing, is the combined effort between Ruppel and Carl Mottram of the Mayo Clinic. This chapter addresses appropriate exercise protocols, the recognition of the anaerobic threshold, normal physiologic changes that occur during exercise, and evaluation of exercise flow-volume loops. This of course is geared toward the PFT technician and does not go into enough detail for physicians and their interpretations.

Chapter 8, which is new to this edition, is on infant and pediatric PFT. Spirometry, lung volumes, diffusion capacities, blood gases, pulmonary mechanics, and challenge tests are all discussed, with attention to how these measurements differ for pediatric patients. This chapter suggests techniques for approaching young children for testing, modifications to the testing protocol for standard pulmonary test, the effects of sedation on physiologic variables and pulmonary testing with infants, and strategies for interpretation.

Chapter 9 deals with specialized test regimens and uses tests covered in the previous chapters. These regimens include bronchoprovocation testing (methachol-

ine, histamines, and antigenic agents), exercise-induced bronchospasm, preoperative testing, and disability testing. Metabolic measurements are also addressed in this chapter, including indirect calorimetry as a means of assessing the patient's nutritional status.

In Chapter 10 Ruppel describes PFT equipment, including volume-displacement and flow-sensing spirometers, peak flow meters, breathing valves, pulmonary gas analyzers, blood gas electrodes, oximeters, body plethysmographs, and computerized PFT systems. The advantages and disadvantages of the various pieces of equipment are also discussed.

Chapter 11, the final chapter, addresses quality assurance and related issues. The general concepts discussed include equipment standards for spirometers and blood gas analyzers. This chapter also explains quality control for PFT and blood gas analysis equipment. Commonly encountered problems with various types of equipment are listed in the troubleshooting guide. Also included is a section on infection control and safety issues.

Having read many books on PFT, I found this book interesting and well organized. Many textbooks of this nature can be dry and on the boring side, but this book presents its information in a way that holds the reader's interest and anticipates questions, giving the reader an opportunity to find the answer in the same area of the book. Each chapter's objectives are clearly stated, and Ruppel uses the same chapter format throughout the book, which makes it easy to find information. Scattered throughout the chapters are "PF Tips," which Ruppel uses to present short, informative points on the current topic. I think readers will really appreciate his interesting tips on quality control, patient cooperation, and performance. He also includes many easy-to-read-and-understand tables and illustrations. Each chapter ends with self-assessment questions and case studies that illustrate the important points stated in the chapter objectives. This book is well designed for the respiratory student, pulmonary technician, or someone setting up a PFT laboratory.

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Tuberculosis, 2nd edition. William N Rom MD MPH and Stuart M Garay MD, editors. Foreword by Barry R Bloom PhD. Philadelphia: Lippincott Williams & Wilkins/Wolters Kluwer. 2004. Hard cover, illustrated, 944 pages, \$159.95.

Only a century ago, tuberculosis (TB) was one of the leading causes of death in the United States. Even now, one third of the world's population is infected with *Mycobacterium tuberculosis*, and approximately 2 million people die of TB worldwide yearly. We know how to diagnose and treat it, but its current epidemiology makes TB one of the most important pathogens in the world today.

The second edition of **Tuberculosis**, edited by Rom and Garay, is a comprehensive, multi-author, hard-cover textbook that has 944 pages, 6 sections, and 60 chapters. It is most suitable for pulmonologists, infectious disease specialists, and public health practitioners involved in the field of mycobacterial diseases, although the book also contains chapters useful to basic scientists whose research includes mycobacteria and their immunology. Each chapter is well referenced and most contain many tables and figures that highlight important points in the text.

The first section covers basic TB epidemiology and current use of molecular epidemiology. In the first edition there were 2 fascinating chapters on TB history and the sanatorium movement, as well as several chapters on TB transmission and applied molecular epidemiology. Unfortunately, those chapters were removed when the editors reduced the number of chapters.

Section II covers current knowledge of the genomics and microbiology of *M. tuberculosis*. The chapters on genomics (the newly sequenced genome of *M. tuberculosis*) present only a brief description of selected features, so that clinicians (including me) who do not have updated knowledge on genomics can pick up the key points on the basic biology of *M. tuberculosis*. Interestingly, there is a genetic comparison of different strains of Bacille Calmette-Guérin (BCG, an attenuated strain of *M. bovis* used in preparation of BCG vaccine) and *M. tuberculosis*.

Section III covers host response and immunology. The section consists of 11 chapters and discusses new developments in and understanding of host immune response.

Section IV, which consists of 23 chapters, describes clinical aspects of TB, including nontuberculous mycobacterial disease. I think this section is extremely valuable, especially because of the abundant illustrations in each chapter. Because of the references cited and the many clinical images and radiographs, this section adds depth and perspective to the similar sections in other TB reference books, such as *Tuberculosis: A Comprehensive International Approach* (2nd edition, edited by Reichman and Hershfield, published by Marcel Dekker, 2000), *Tuberculosis: Current Concepts and Treatment* (2nd edition, edited by Friedman, published by CRC Press, 2000), and *A Clinician's Guide to Tuberculosis* (by Iseman, published by Lippincott Williams & Wilkins, 2000).

Section V, which deals with TB therapy, emphasizes individual TB drugs. However, there is only a short discussion comparing various combination regimens and how to

deal with the challenges of monitoring the clinical aspects of these complex regimens.

The final section covers TB prevention and control and public health aspects of TB. This section might have been more useful if it had included chapters on contact investigation and other aspects of public health.

Despite the book's 2003 publication date, 2 recent guidelines published in 2000 were not fully incorporated or examined. I hope the next edition will pay attention to the latest American Thoracic Society and/or Centers for Disease Control guidelines.^{1,2}

In summary, the editors have produced a valuable reference for clinicians who encounter TB patients in their practice, and it will also be a useful reference for basic scientists in TB research. The second half of the text covers the entire clinical spectrum of TB, from common TB manifestations (eg, pulmonary TB, miliary TB, and TB adenitis) to relatively rare forms (eg, ocular TB,

cutaneous TB), which I found very informative and valuable.

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