

Physiologic Basis of Respiratory Disease.

Qutayba Hamid MD PhD MRCP FRCPath, Joanne Shannon MD, James Martin MD DSc. Hamilton, Ontario, Canada: BC Decker. 2005. Hard cover, illustrated, 793 pages plus CD ROM, \$159.

Despite its relatively young age as a science, medicine has grown through a number of phases in which different disciplines have been the focus of research and clinical care. Anatomy, physical diagnosis, organ physiology, cellular physiology, and epidemiology have all been emphasized as key foundations to medicine throughout its evolution. Evidence-based medicine, the latest interest, deemphasizes dependence on pathophysiology by instituting protocols derived from the experience with thousands of patients. While the protocols provide a sense of security to the clinician, the understanding of physiology remains the cornerstone of knowledge when caring for critically ill individuals, especially those with respiratory or hemodynamic compromise. This book by Hamid, Shannon, and Martin is a welcome addition to the medical literature because it revisits the physiology and pathophysiology of respiratory diseases, strengthening the foundation of organ physiology for clinicians and medical-school teachers. It also provides a historical perspective on one of the greatest respiratory physiology laboratories in the world: the Meakins-Christie Laboratories at McGill University.

The book is a collection of works from over 100 authors, who contributed to 64 chapters. The authors are world-class respiratory physiologists who write on their areas of research interest and relate them to the pathophysiology of respiratory diseases. Most of the authors have a tie to the Meakins-Christie Laboratories as prior faculty or trainees. Each chapter is succinctly written, ranging from 6 to 14 pages, and focusing on a specific physiologic aspect. These chapters are organized into 8 sections, covering (1) anatomy, (2) mechanics of breathing, (3) ventilation, pulmonary circulation, and gas exchange, (4) respiratory muscles and control of breathing, (5) airways and lung disease, (6) exercise physiology, (7) sleep-disordered breathing, and (8) clinical respiratory physiology. The chapters are illus-

trated primarily with graphs and drawings that represent the physiologic concepts. In general, the chapters are well referenced but they tend to cite work from the 1970s and 1980s. It is not that recent work was overlooked, but, rather, there has been relatively little "new" research on these subjects.

A CD-ROM is included with the book, and it includes all the book's chapters in portable display format (PDF) files that are easily opened with the Adobe Acrobat program. The CD-ROM is stated to be "dual-platform," which I assume means compatible with Windows or Macintosh computers. There is no indication as to whether it can be read by the Linux operating system. I was able to open all of the chapters on a Macintosh running the OS X operating system. On the disc there is an application named "Startme" that requires the Macintosh OS 9 and the classic mode to run. It also requires an older version of QuickTime and the application did not work for me. The inclusion of the chapters as electronic files allows the reader to use a computer to read the book. Another great advantage would be if the figures from the book could be used in slide presentations (with appropriate credit to the authors). Unfortunately, I was not able to copy and paste figures from the PDF files.

The strengths of this collection are that it does not attempt to be encyclopedic, and the depth of coverage in each chapter is well balanced. There is more detail than in West's classic books *Respiratory Physiology: The Essentials* and *Pulmonary Pathophysiology: The Essentials*, but considerably less detail than in the *Handbook of Physiology: The Respiratory System*, published by the American Physiological Society. Many of the chapters take a quantitative approach, using mathematical formulas to represent the concepts. In general, there are considerably more details than need to be known by the respiratory practitioner.

Though the editors state in their preface that the book may not be evenhanded in the respiratory-physiology subjects it covers, the depth of coverage is highly variable, depending on the subject matter. For example, the chapters on the mechanics of breathing are rich in detail and could serve as primary sources of reference, whereas pulmonary cir-

ulation is only superficially covered and hemodynamics of the right heart and pulmonary vasculature are not addressed at all. It is clear that these topics were chosen more because of the authors' special interests than because of the importance of the topics to respiratory medicine, and the topic-selection reflects the research interests of the Meakins-Christie Laboratories. Given the focus on respiratory mechanics, it was especially disappointing not to see any chapters on the physiology and pathophysiology of respiratory failure and mechanical ventilation. And some chapters appear to have been thrown in without clear ties to respiratory physiology, such as those on lung transplantation and eicosanoids in lung disease. In general, the chapters are rewrites of work published 20–30 years ago. There has been little effort in most of the chapters to rewrite the work in a more contemporary style that might be more accessible to the current generation of clinicians. Also, some of the chapters do not include the most recent research findings on their subjects; the newest works referenced are from the 1980s.

It is tempting to speculate why this book was written. The book's foreword, by Barnes; the preface, by the editors; and the chapter on the history of the Meakins-Christie Laboratories, by Macklem, suggest that the incentive to write the book came from a perceived need to document the broad research performed at Meakins-Christie Laboratories and its impact on respiratory physiology. It also brings together the works of a number of scientists who share a historical link to the Meakins-Christie Laboratories. The book's content does not really fill any conceptual or informational holes in available textbooks. Many of the authors have written similar chapters in other books.

The ambiguity in the incentive for writing this book translates into an uncertainty in the intended readership. The detailed physiology will be of great interest to some respiratory clinicians, but the sections on pathophysiology seem to miss the mark for being of value in caring for patients with respiratory diseases. This book will probably be of greatest interest to the academic respiratory physician/researcher, a teacher of respiratory physiology, or the respiratory therapist who wants a single reference source

for respiratory physiology and pathophysiology. I enjoyed reading the book for its historical information and appreciated the collection as a single repository for all of the great work performed at the fabled Meakins-Christie Laboratories.

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Pulmonary Pathophysiology, 2nd edition.

Juzar Ali MD, Warren Summer MD, Michael Levitzky PhD. Lange Medical *Physiology* series. New York: Lange Medical Books/McGraw-Hill. 2005. Soft cover, illustrated, 317 pages, \$34.95.

Although the back cover bills Lange's **Pulmonary Pathophysiology** as a "handy guide" for students and clinicians, the front cover claim of "Great review for the United States Medical Licensing Examination" (the "boards") more accurately reflects the thrust of this text. In preparation for step 1 of the boards, many medical students feel compelled to stuff all medical facts, great and small, into their heads. This requires students to review what has been forgotten—as well as digest new esoteric topics—and to do so in a hurry.

Pulmonary Pathophysiology does meet the boards-preparation specifications of both brevity and breadth. It reads more like a review rather than a thorough introduction to "bread and butter" topics, while offering at least cursory coverage of unusual diseases. For instance, the text succinctly discusses asthma and chronic obstructive pulmonary disease in 14 pages, but provides an extensive discussion of causes of noncardiac chest pain, including mitral-valve prolapse, Coxsackie-B-induced pleurodynia, and xiphoidalgia. In this respect, better introductory texts to respiratory pathophysiology are available. At the same time, the text provides insufficient details on diagnosis and management to be of much practical use to clinicians. Respiratory therapy and nursing students in need of a review, however, may find portions of it helpful.

The text is divided into 2 parts and 15 chapters. The first part is about symptoms and physical-examination findings and contains chapters on dyspnea, cough, hemoptysis, noncardiogenic chest pain, and lung sounds. The second part is structured according to categories of disease and includes

chapters on obstructive lung disease, parenchymal lung disease, pulmonary vascular disease, respiratory infections, pleural disease, respiratory abnormalities with sleep disorders, respiratory failure, lung under stress, pediatric lung disease, and miscellaneous topics such as transplantation and drug-induced lung disease. A focused discussion of lung cancer is notably absent.

Pulmonary Pathophysiology is meant to complement the 6th edition of *Pulmonary Physiology*, by Levitzky, and the authors assume the reader is well-versed in respiratory physiology, including abnormalities in gas exchange. For instance, the opening chapter, on dyspnea, explains normal ventilation-perfusion, low ventilation-perfusion, dead-space ventilation, and hypoventilation in 7 sentences, without the use of a figure.

At times, terminology is used imprecisely, such as a description of pulmonary embolism causing hypoxemia through creation of high ventilation-perfusion lung units. The majority of the book is written with adequate clarity, but some chapters are hampered by suboptimal organization, difficult prose, and redundancy. For instance, the pathophysiology of acute respiratory distress syndrome is discussed in multiple chapters, although the criteria for its clinical diagnosis are not included. Sprinkled throughout the book are instances where the text conflicts with information contained in a table, figure, or another chapter.

The book contains an abundance of figures, tables, and radiologic images. The figures borrowed from previous publications are excellent, but a few of the original figures are confusing. For example, an algorithm for the evaluation of acute dyspnea incorporates obstructive and restrictive pulmonary function tests but doesn't explain these terms until later in the chapter. Some recommendations, such as that of using the 6-min-walk test to differentiate congestive heart failure from other causes of acute dyspnea, raise questions about the basis of the algorithm. The chapter on dyspnea also contains tables that outline the modified Borg and American Thoracic Society shortness-of-breath scales, but arguably this level of detail is of limited value in the context of a student review or introductory text. The tables are easily legible and for the most part are otherwise functional. The vast majority of the chest radiographs and scan images are of good quality and serve their purpose.

This second edition has added Key Concepts sections that link to specific segments of text. For the most part they highlight important teaching points, but occasionally the generality of the statements limits their utility (eg, "Respiratory failure is common, but the etiology is varied and may be multifactorial."). The new chapter on lung sounds provides a clear, concise bridge between the symptoms-based and disease-based sections. Each chapter also includes 2–4 brief case presentations and 2–4 study questions. The former nicely illustrate the clinical applicability of the preceding material, but the latter often are not clearly written, or place undue emphasis on atypical presentations, unusual diseases, or relatively esoteric facts.

The index is comprehensive and accurate. The text's relatively small size (23 × 15 × 13 cm) and soft cover impart a relatively small additional risk of musculoskeletal injury when tossed into an already hefty backpack.

Pulmonary Pathophysiology is best-suited to students preparing for the boards, and perhaps others early in their training who need to rapidly review a large volume of material. How well it succeeds as a boards-review tool is difficult to assess, in part because the National Board of Medical Examiners is less than forthcoming about what it expects of learners. Nonetheless, the deficits outlined above indicate that there remains substantial room for further improving this text. Writing the ultimate boards-review pulmonary pathophysiology text is, without question, a monumental task, and **Pulmonary Pathophysiology** does many things well. Hopefully a 3rd edition will see the text advance from an adequate to an excellent resource for students.

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Practical Pulmonary Pathology: A Diagnostic Approach. Kevin O Leslie MD and Mark R Wick MD. Philadelphia: Elsevier/Churchill Livingstone. 2005. Hard cover, illustrated, 813 pages, \$275.

There is no dearth of books depicting and illuminating the wonderful but challenging field of pulmonary pathology. For the past generation it had been only Spencer's *Pathology of the Lung*. More recently, seasoned pathologists have been relying on the

Armed Forces Institute of Pathology fascicles and atlas, and on the short treatise by Katzenstein, which continue to contain all that is really needed by the professional pathologist. Several other high-quality textbooks have recently appeared on our shelves and are occasionally helpful. Choosing one depends on the purpose of the consultation. One must keep in mind the strengths and expertise of the authors. Did we need a new book on pathology of the lung? In this case, the answer is yes, we did, because none of the above books is a *practical* pathology like this multiauthor volume edited and (in part) written by Leslie and Wick.

Many pulmonary health workers need an easy-to-read textbook that is comprehensive but not of frightening size, with well-chosen illustrations of the majority of lung disorders and introductory references to initiate clinical research projects or understand present situations. Among these, first and foremost, is community-hospital pathologists, who are not always familiar with lung pathology, in particular with non-neoplastic lung diseases. This book is particularly suitable for a quick consult because of its easy-to-read tables of differential features and pretty pictures for comparison with findings in problem slides. This is particularly true of the section on open biopsies of interstitial diseases (traditionally a weak spot of many community hospitals), which counts among the best and most lucid presentations in this book.

A second group of potential readers is pulmonary fellows preparing to take the subspecialty boards, who worry about the number of pathology questions that they will certainly face in the examination. In any pulmonary training program, pathology plays a major role. Brief booklets or introductions do not help the fellows, because they already know all the common ailments. They only need help when their patients suffer from difficult or unusual problems. For consultations (if they don't have a friendly local pulmonary pathologist) fellows require a comprehensive but accessible textbook, and **Practical Pulmonary Pathology: A Diagnostic Approach** is well suited for that role. The enclosed CD-ROM, which includes all the pictures, drawings, and tables, will in many cases provide all the clarifications and illustrations needed for their clinical presentations. To a lesser degree, this work also holds some limited interest for other professionals such as respiratory therapists and nurses in training, as a

consultation volume, because of the relatively plain and accessible language used in most chapters.

This textbook is, as the title proclaims, a *practical* treatise, not a full-blown academic textbook of lung pathology, and, to my knowledge, it is the first one of its kind. It clearly aims at helping lung workers to deal with and understand daily anatomic problems, not at identifying or resolving current controversies or pinpointing research directions. The authors summarize their philosophy of teaching pathology by familiarizing readers with a few basic anatomic *patterns*, described in a brief introduction, and organize most of the book to develop the application of these patterns. The idea is well taken and attractive, although it could be argued that only trained pathologists identify patterns. It is the experience of many pathologists used to discussing cases in multiheaded microscopes and giving presentations to pulmonary specialists and surgeons that most nonpathologists have great difficulties identifying simple anatomic entities, more so patterns.

A second problem is that several entities logically end up being discussed in more than one chapter (for instance, sarcoidosis is presented in conjunction with airways, interstitial, and vascular diseases) and that it results in more than one unexpected classification, although we should keep in mind that many pulmonary diseases are idiopathic and that this situation challenges the best classification schemes.

The language is understandable and generally precise, although the diversity of authors is occasionally noticeable. The nomenclature in this rapidly changing field is up to date and generally in tune with the leading institutions, at least up to the time of publication. The authors do not hesitate to surprise readers with names that are not yet popular. BOOP (bronchiolitis obliterans organizing pneumonia) has become COP (cryptogenic organizing pneumonia). The old "sugar tumor" is now an epithelioid myomelanocytoma, no longer a PECOMA (perivascular epithelioid cell tumor), as it had been called in the meantime. An inflammatory pseudotumor has become an inflammatory myofibroblastic tumor, and adenomatoid malformations are now congenital pulmonary airway malformations (CPAMs). I found especially exciting the word pneumocytoma now gracing the rare entity previously known as sclerosing hemangioma. One must know these things. The

list could be extended. As far as names are concerned, the most controversial section is the one on malignant neuroendocrine tumors, for which the authors adopt the famous system of the neuroendocrine carcinomas grade I represented by the typical carcinoid (absurdly called classical carcinoid by the book), grade II, which is the atypical carcinoid, and grade III (small-cell and large-cell neuroendocrine carcinomas). Many aspects of neuroendocrine tumors are vexing and, as I suspect, still unsettled. This nomenclature has been tried before, without much success.

It may represent an inexcusable abuse of a temporary position of strength when a reviewer sets out to publicly identify errors and omissions in a new book. After all, everybody is entitled to his opinions, and this book is not particularly controversial. Even so, some experts in pulmonary pathology might take issue with certain of this book's statements, but this does not change the fact that the presentation is clear, as easy to read as it can be, mostly complete, appropriately short (with exceptions), and takes into account the latest developments. I was somewhat disappointed at the treatment given to the immunohistochemical markers, which play an increasingly important part in our daily practice. Here the reader looking for simple tables and advice to resolve a current problem will instead have to negotiate large paragraphs with more detail and critical descriptions of practical and unpractical markers than he probably cares for. I was far more impressed with the chapters on benign pulmonary diseases (interstitial diseases in particular are a strength of the first author), infections, drug reactions, and similar items than with the discussion of malignancies.

The inclusion of unusual entities and the workup of metastatic disease, which is a growing problem in modern pulmonary oncology, is great and helpful. Many descriptions will only be fully appreciated by a practicing pathologist when he is unexpectedly confronted, after years of boring routine, with a condition that he knows only by name and has never seen—an exhilarating experience not limited to academic centers. On the other hand, the chapters dealing with our "bread-and-butter" (lymphomas, the common carcinomas of the lung) are good but may not meet the same standard of excellence. I only take exception with the lengthy section devoted to the malignant mesotheliomas, which, departing from the style

and expanding the objectives of the book, is combative, controversial, and editorializing. It was astonishing to read that, in the experience of that chapter's author, "40–50% of malignant mesotheliomas are spontaneous neoplasms with no definable etiologic linkage to asbestos" (p. 737). Many in the community will, as do I, respectfully disagree.

In addition to the usual introductory chapter on lung anatomy, this book has a useful, brief summary of chest radiology and explanations of common surgical techniques and biopsy procedures. Many specific items include useful illustrations of the associated radiologic findings and the gross appearance of specimens.

The illustrations were, for me, the most appealing part of the book, as they should be, in view of the book's practical emphasis. In multi-author books, some heterogeneity is difficult to avoid, but in general the chapters are lavishly illustrated. Many of the items depicted are rare and images are not easily found. Their availability here will be an invaluable resource to pathologists, pulmonologists, residents, and even medical students. I suspect, however, that neither the printed images nor the digital reproductions in the accompanying CD do full justice to the original micrographs. In addition to trying it out myself, I lent the CD to a photograph technician and to 3 residents of my department. One of us reported that it was easy to use, another one gave up in frustration, and three had some difficulties but easily overcame them to view the contents. This is not unlike the experience with other digital media on the market. The CD should be more user-friendly in future editions.

All the chapters are followed by a fair number of key references that will suffice to start a good literature search. The book is well printed, with pleasant and clear fonts, and the index—a crucial element of a consultation book—is good and lived up to my expectations almost every time I tried it.

In short, this is a good book that is needed and will be helpful to many. In my opinion, its outstanding collection of histologic, gross, and radiologic illustrations of common, uncommon, and very uncommon conditions and tumors is its greatest asset.

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Thurlbeck's Pathology of the Lung, 3rd edition. Andrew M Churg MD PhD, Jeffrey L Myers MD, Henry D Tazelaar MD, and Joanne L Wright MD. New York: Thieme Medical Publishers. 2005. Hard cover, illustrated, 1157 pages, \$249.95.

With the large number of excellent textbooks that currently address pulmonary pathology, one could question whether another text in this field is necessary. In the case of **Thurlbeck's Pathology of the Lung**, the answer is clearly and enthusiastically *yes*.

This is the third edition of this now classic text, and, in my opinion, the best. The back cover refers to the text as the "bible" of pulmonary pathology, and this at first might appear to some to be an audacious claim. Yet, if by "bible" one means a source of truth that can be turned to repeatedly for new insights, then this metaphor is wholly appropriate. As a practicing pulmonary pathologist, my bookshelf includes virtually all of the currently available texts of lung pathology. Most of them are collecting dust and taking up space. But when I need to locate a useful fact or reference, I reach for **Thurlbeck's**.

It has been some time now since this book's original author, "Whitey" Thurlbeck, passed. But the current editors continue to produce a text as authoritative as his was. The list of contributing authors is a veritable "Who's Who" of pulmonary pathology. Each contributor is an internationally recognized expert in his or her field. The result is that each chapter is filled with a wealth of evidence-based information, and written in the voice and from the perspective of an established expert.

Within its thousand-plus pages, certain chapters deserve special mention. De Paape's chapter devoted to developmental disorders summarizes a subject that can be challenging for the pathologist who primarily encounters adult disorders. The text includes chapters on lung anatomy co-authored by Kuhn and Wright. Wright has improved on Thurlbeck's chapter on quantitative anatomy, a subject of special interest to Thurlbeck. The chapters on basic lung structure ought to be required reading for training in pulmonary pathology; I highly recommend it, for its content and clarity, to both practicing pulmonologists and thoracic surgeons. Churg's chapter on how to handle biopsy specimens and Wright's chapter on "special techniques" are excellent contributions on

subjects with which the general surgical pathologist should be acquainted.

As a pathologist with specific expertise in the pathology of pulmonary infection, I found the chapters by Procup and Tazelaar of particular interest. The chapter on tuberculosis and other mycobacterial infections may be the best presentation I have seen in a pathology textbook on this important subject. The chapters on fungal, protozoal, and helminthic diseases, by Sobonya and Fraser, are also expertly presented.

A particularly outstanding contribution is the chapter on interstitial lung diseases, by Myers. Whereas this is a subject that at times appears to be continuously in flux, Myers concisely summarizes the state of the art with respect to the categorization of interstitial lung disease and succeeds in dispelling the confusion that at times seems to pervade the field.

Hogg's chapter on pulmonary edema synthesizes the pathophysiology with the morphologic changes that accompany changes in alveolar-capillary permeability. An outstanding chapter by Churg and Green reflects 2 lifetimes of investigation of occupational lung disease.

The aforementioned chapters are merely a sampling of the consistently high-quality presentations in this text. Others, including the chapters on vasculitis and pulmonary hemorrhage, by Youssef, and the detailed reviews of benign and malignant pulmonary neoplasia, by Cagle and Tazelaar, are as noteworthy. Elsewhere, Cagle nicely explicates and illustrates the specific issues encountered in lung-transplant pathology. Finally, the text is capped off by Churg's approach to the disorders of the pleura and by a must-read chapter on pulmonary cytopathology by Amy.

Reading this enthusiastic review, the reader may rightfully ask whether this text has any deficits. Unfortunately, the answer is yes. The one glaring problem that is certain to cause some disappointment is that the (copious) illustrations are all in black-and-white. The emphasis on morphologic images in the practice and training of diagnostic surgical pathology may mean that some readers who look to this text for assistance in establishing a diagnosis may find the black-and-white reproductions inadequate, especially since some of the recent competing lung pathology texts include beautiful color illustrations. For this reason, this text may appeal more to pathologists who have already established expertise in

lung pathology, and who are not so much seeking assistance in diagnosis as deepening their knowledge of lung disease. From this perspective, the text is an unqualified success. At this stage in my career, I, for one, increasingly find myself far less interested in texts that abound with color images. However, recognizing that black-and-white may not grip the imagination of many readers, it is unfortunate that the publisher of this otherwise beautiful text did not opt to enhance its beauty with color images. Yet, having admitted this substantial flaw, if I had only one text to recommend to others, or to pore over for my own delight, **Thurlbeck's Pathology of the Lung** would be the one.

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Air Pollutants and the Respiratory Tract, 2nd edition. W Michael Foster and Daniel L Costa, editors. *Lung Biology in Health and Disease*, volume 204, Claude Lenfant, executive editor. Boca Raton, Florida: Informa/Taylor and Francis. 2005. Hard cover, illustrated, 447 pages, \$199.95.

The health effect of air pollutants is increasingly recognized as an important medical issue that primary-care and specialty physicians should become more cognizant of when evaluating patients with cardiovascular and respiratory complaints. **Air Pollutants and the Respiratory Tract** is an excellent compilation that elegantly summarizes current scientific understanding of the health effects of air pollutants. The book is designed to support the editors' paradigm that epidemiologic and basic research has adequately determined the toxic effects of air pollutants on the heart and lungs. International experts were selected to comprehensively address specific research subjects to support the editors' hypothesis.

This comprehensive review is divided into 12 chapters. The first chapter summarizes what we have learned from epidemiologic studies about the effects of air pollution on health. The authors review several studies that present mortality data associated with air pollution. They also review economic issues pertaining to the relationship between respiratory disease and air pollution, in the context of increased hospitalizations, emergency-room visits, and respiratory exacerbations that require in-

creased medication. There is also discussion of susceptible subpopulations at risk from air pollution.

Chapter 2 discusses particulate dosimetry in the context of respiratory anatomy and physiology, which is intended to give a better understanding of exposure dose-response relationships. The basic structure of the respiratory tract is reviewed in the context of how particles are deposited in the large, medium, and small airways. The authors review how demographic features such as age and gender affect particle deposition, and they also discuss particle clearance.

Chapter 3 reviews the bioavailability of particle-associated air pollutants and its relationship to cardiopulmonary injury. Useful tables summarize biochemical composition of air pollutants in various cities throughout the world and help explain particle-associated lung injury. There is extensive information on particulate matter, metals, and organic compounds, and discussion of the mechanisms of particulate-matter-injury to the respiratory tract and cardiovascular system.

Chapter 4 addresses genetic susceptibility to air-pollution-induced cardiopulmonary disease. Classic genetic models are discussed and pulmonary and cardiovascular studies are presented to support these models, including several studies of genetically modified mice.

Chapter 5 addresses how air pollutants interact with airway epithelial surfaces and emphasizes the importance of the epithelium as the first-line defense against the external environment. Here the authors discuss the primary function of epithelial cells in the "United Airways" (nasal passages, nasal pharynx, larynx, tracheal-bronchial tree, and lower respiratory tract) and how they interface with the environment. The authors cite several studies that used animal models to study how air pollutants affect the respiratory epithelium in both normal and disease states.

Chapter 6 addresses disease irritant agonists and air pollutants and reviews neurologic mechanisms that may mediate respiratory and cardiovascular responses to air pollutants. The authors discuss general characteristics of sensory nerves in the upper and lower respiratory tract, mechanisms of sensory-nerve activation, and the role of the central and autonomic nervous system. They further elaborate on how airway and cardiovascular responses are initiated by stimulation of airway mucosal sensory nerves.

Specific examples of irritant stimuli—such as ozone, sulfur dioxide, and nitrogen oxide—that affect sensory nerves in the respiratory tract are discussed in detail. The authors conclude that, in animal models, C fibers protect the respiratory system from injury by air pollutants, but more work is required to determine if this is true in humans.

Chapter 7 addresses the role of signal transduction and subsequent cytokine expression in particulate-matter-induced airway remodeling. Again, this chapter focuses mainly on particulate matter, which significantly increases morbidity and mortality in patients with pulmonary and cardiovascular disease. The authors discuss in great detail the complex mechanisms of cytokine signaling in the airways in response to particulate-matter exposure, and they emphasize the complexity of this response.

Chapter 8 describes the health effects of chronic exposure to oxidant air pollutants. Here the authors discuss in great detail the sources and distribution of these air toxins and the health effects of specific oxidant air pollutants, such as ozone and constituents of particulate matter, such as transition metals, organic compounds, and nitrogen dioxide. The chapter also reviews epidemiologic studies of their effects on several disease states, including asthma, cancer, and cardiovascular disease.

Chapter 9 addresses pulmonary toxicity of occupational exposures to fibers and nanoparticles such as silica, asbestos fibers, and insoluble particles. Numerous animal studies of lung injury by these inciting agents are reviewed to support the authors' assertions.

Chapter 10 addresses the important issue of biological airborne pollutants, which include viruses, bacteria, fungal spores, and plant materials. The author clearly defines what constitutes a bioaerosol and describes from where they emanate and how they are disseminated. Hypersensitivity disease states associated with bioaerosol exposure are reviewed in thorough detail.

Chapter 11 discusses the health effects of emissions from combustion of coal, petroleum products, (eg, diesel, fuel oil, gasoline), vegetation and biomass (eg, wood smoke, forest fires, agricultural burning), cooking emissions, and tobacco smoke.

Finally, Chapter 12 discusses air pollution in the context of public health safety and provides compelling reasons to implement regulations to improve outdoor air

quality. The authors present compelling data that improving air quality has a very favorable cost/benefit ratio for society, because it will significantly reduce air-pollution-induced health problems.

In conclusion, **Air Pollutants and the Respiratory Tract** is an extremely useful reference for anyone interested in the sources and health effects of air pollution. The editors and their extremely creditable group of air-pollution experts succeed in conveying the important knowledge that has been compiled over the past several decades, which supports the relationship between air pollution and adverse health effects. I hope that texts of this type will increase public awareness about the ill effects of air pollution and help legislators and political action groups in their quest to improve the air we are all breathing.

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Chronic Obstructive Pulmonary Disease: Cellular and Molecular Mechanisms.

Peter J Barnes, editor. *Lung Biology in Health and Disease*, volume 198, Claude Lenfant, executive editor. Boca Raton, Florida: Informa/Taylor and Francis. 2005. Hard cover, illustrated, 521 pages, \$199.95.

Several new books have recently been published about chronic obstructive pulmonary disease (COPD). This is part of a gen-

eral upsurge in clinical and research interest in this disease. This book is part of the long-running and extensive *Lung Biology in Health and Disease* series. Does this book add to the available literature on COPD? It is indeed the first book with a focus on the molecular and cellular mechanisms of COPD. This is timely because, as we learn more about the role of inflammation in the development and progression of COPD, there is increasing awareness of the need to understand the mechanisms, cells, and molecules involved in this process.

The book is 521 pages long, with 19 chapters, and 33 contributors. The contributors are international experts in COPD research, with European and North American representatives. After an initial introduction by Barnes, the structural and pathologic aspects of COPD are presented and contrasted with asthma in the subsequent 3 chapters. Following these are several chapters devoted to mucus, cells, and mediators involved in COPD. Specific aspects of COPD, such as corticosteroid resistance, genetics, exacerbations, systemic effects, and vascular changes are discussed in subsequent chapters. The final chapter is a look by the editor into the future.

The book's organization provides a fairly comprehensive coverage of the cellular and molecular mechanisms of COPD. A paper specifically discussing how smoking interacts with these various cellular and molecular mechanisms would have added to the book. Cellular aspects of the inflammatory process of COPD are discussed at great length, but the amount and depth of discus-

sion of the mediators involved is relatively limited and could have been more extensive.

The quality of the information provided in the individual chapters is very good, which is not surprising, as most of them are written by leaders in the field. Though in general the diagrams and illustrations are excellent, the pathology chapters could have had more photomicrographs, preferably in color. All the chapters are extensively referenced, providing an excellent resource for further in-depth study.

This book is aimed mostly toward researchers and academicians interested in COPD, but clinicians are not completely ignored; translational aspects of the basic information are discussed in several chapters, such as those on mucin, oxidative stress, and antiproteases. Unfortunately, most of these therapies remain investigational, so clinicians who care for patients with COPD may not find this book useful in their day-to-day practice. Researchers and academicians involved with COPD would find that this book provides an excellent basic framework to understand the cellular and mechanistic aspects of COPD.

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