

Clinical Challenges in COPD. Claudio F Donner MD, Mauro Carone, editors. Oxford: Clinical Publishing. 2007. Hard cover, illustrated, \$99.95.

Imagine a clinical “grand rounds” series at the local medical center, dedicated just to chronic obstructive pulmonary disease (COPD). Each week at this special conference, a particularly instructive case would be presented and then discussed by a different team of international experts on the specific aspect or management problem illustrated by that patient. By attending this conference regularly, clinicians who cared for patients with COPD would gain new understanding of its pathophysiology and manifestations and also be updated about new research findings and approaches to therapy. If the cases were carefully selected to illustrate clinically important, particularly challenging aspects of COPD management, and if the experts discussing them focused on the practical application of available diagnostic tests and therapeutic interventions, then over the course of several months the attendees would acquire knowledge and insight directly applicable in their own practices, to the benefit of their patients.

In this book Donner and Carone give us what could be the experience of attending such a weekly conference over a period of about 6 months. Each of the 21 chapters is presented in a format very like that of grand rounds. There is a brief introduction to set the stage for that week’s topic, followed by the presentation of an actual patient with COPD whose case has been selected to illustrate a particular clinical problem, and then a focused, in-depth discussion of how best to recognize and manage that problem. The book may thus be thought of as a continuing-education vehicle for practicing clinicians, rather than as a textbook or monograph on COPD. As with real-life weekly conferences whose discussants each have their own specific topics of interest, although many aspects of the disease and its management are illustrated by the presented cases, some topics are emphasized more than others, and a few are left out.

The organization of the book—or the apparent lack thereof—reflects what happens at a weekly case conference, with topics

presented as they arise in clinical practice rather than according to a carefully mapped-out curriculum to cover the field in a particular sequence. As a result, this is a book that can be read straight through, or opened at random to read a few pages as time allows, or consulted for a specific problem presented by a patient, using the table of contents or index as a guide.

Most of the chapter titles identify the clinical problem to be discussed, such as “A 52-year-old woman with mild COPD and substantial oxygen desaturation during exertion,” although in a few instances the topic is not evident from the title, as in “A 68-year-old patient with COPD.” Chapter topics run the gamut of important issues encountered in managing COPD: diagnostic evaluation, the use of medications, pulmonary rehabilitation, managing exacerbations at home and in the hospital, and identifying and treating common complications. A few chapters address infrequently encountered issues such as hypersensitivity pneumonitis, mitral stenosis, and reactivation of tuberculosis. I especially liked the chapter by Mahler and Scano on managing dyspnea in patients with end-stage COPD, the one by Troosters and Casaburi on exercise evaluation and training, and the one by Jones and Güell Rous on improving health status and quality of life. However, with only 1 or 2 exceptions, all the chapters cover their topics well, answer the questions posed by the patients presented, and are clinically relevant.

In an otherwise excellent chapter that discusses the choice of antibiotics for treating COPD exacerbations, the authors provide lists of antibiotics from which to choose for different types of exacerbation, depending on patient factors—with no mention of costs. Among the agents appropriate for “simple” exacerbations the list includes cefpodoxime (retail patient charge for a 10-day course \$82.80 in my hospital’s pharmacy) and doxycycline (\$5.95), whereas the “complicated” exacerbation list includes moxifloxacin (\$89.15) versus amoxicillin/clavulanate (\$4.20). Given the chapter’s discussion of the difficulties in demonstrating clinical superiority of one antibiotic over another in this context, acknowledging the existence of such cost differences would have been

pertinent for the reader, regardless of the health-care system in which he or she practices.

In a couple of places it would have been useful to provide more discussion on how to approach the presenting clinical scenario rather than focusing so much on the specific disease entity that turned out to be the cause of that problem in the patient described. For example, in Chapter 19 a patient is described who presented with hypoxemia out of proportion to the severity of his airflow obstruction, and was found to have chronic thromboembolic pulmonary hypertension. This important but quite uncommon condition is subsequently discussed at length, but a differential diagnosis of the presenting clinical problem would also have been helpful, with a discussion of the other potential causes to be considered and how to evaluate patients for them. Many middle-aged and elderly smokers have heart disease—with or without concomitant COPD—but come to the clinician with respiratory rather than typical cardiac symptoms. It would have been nice to address this common scenario in the book. In Chapter 15 a patient with COPD is presented whose symptoms turn out to be caused by previously undiagnosed mitral stenosis; this disorder is covered extensively in the chapter, but more common cardiac conditions that bring patients to the doctor with similar complaints—such as ischemic disease and congestive heart failure—are not mentioned.

Depression, another very common and frequently debilitating problem in patients with severe COPD, is mentioned in passing several times but not addressed in enough detail to help the reader in recognizing, evaluating, or managing it. Other topics that might have been included are the importance, assessment, and management of chronic hypoxemia and cor pulmonale; case management and approaches for improving therapy-adherence in patients with limited socioeconomic resources or behavioral problems; and current techniques for helping patients to stop smoking. However, the book is deliberately concise and of a manageable size, and the editors have done a good job of including most of the important issues encountered in managing COPD.

The book is an international effort, with authors representing 11 different countries and most chapters having authors from more than one country. However, it has a distinctly Italian flavor, with both of its editors and 19 of the 43 contributors representing that country. In a multi-contributor book with an international diversity of authorship, some unevenness in the English is not unexpected. In general, the chapter introductions and discussions are nicely edited and read well. Occasionally, unfamiliar descriptions and terminology in the case presentations may cause the American reader to stumble, although the intended meaning can nearly always be discerned. One exception was the baffling sentence (on page 171), "In a flat and treatable abdomen a mildly liver enlargement was noted." There is also some variability in the use of units of measure, most problematically so with arterial blood gas tensions, which are mostly in mm Hg but sometimes in kPa. Typographical errors are very few, although one of potential importance (on page 9) recommends a daily prednisolone dose of 30 mL rather than 30 mg.

The 21 chapters average about 9 pages and 40 references (ranging from 5 to 95 references). The text is laid out in a single column that uses a fairly small font, which, with relatively few illustrations and tables, makes for pretty dense reading through some long stretches of uninterrupted text. There is some unevenness in the illustrations. Several of the conventional chest radiographs are poorly reproduced, which makes identification of the intended findings doubtful, although the latter are generally not really crucial to the message. The chest computed tomograms in Chapter 18 are small, uncropped, and lack arrows to identify the abnormalities described, whereas those in Chapter 20 are effectively cropped and labeled. I did not notice the extensive table of abbreviations in the back of the book until after reading the chapters, but this was not a serious problem, as in nearly every case the abbreviations and acronyms are defined in the text on first use.

I found the book's contents to be up to date and accurate. A rare exception was this sentence on page 112: "Although chronic GC [glucocorticoid] therapy clearly reduces morbidity and mortality, GCs must be used prudently in the light of their numerous side effects." This pronouncement is made without elaboration or clarification in the chap-

ter that discusses the complications of prolonged corticosteroid therapy.

These are all minor complaints, and this is a most interesting, unusual, and useful book. It is not an introduction to COPD, and I think it will mainly be of interest to advanced trainees and practicing physicians. The book will also be useful to physician assistants, nurse practitioners, and others who provide front-line care to patients with COPD, but perhaps less so to hospital-based respiratory therapists and nurses who have less responsibility for diagnosis and overall approaches to management.

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Medication Treatments for Nicotine Dependence. Tony P George, editor. Boca Raton: Taylor & Francis/CRC Press. 2007. Hard cover, illustrated, 327 pages, \$149.95.

In the foreword, Tony George reveals his goal that this publication serve as a primer for both basic and clinical researchers, for students of various disciplines, and for clinicians who treat nicotine dependence. Parts of this book may appeal to respiratory therapists and clinicians. However, much of the book, as is suggested by the illustration on the cover, is dedicated to the mechanisms by which nicotine and medications interact with the nicotinic receptors and the pharmacologic profiles of the nicotinic acetylcholine receptor subtypes, which may be less interesting to individuals on the front lines in patient care.

This book, which incorporates contributions from leading basic and clinical scientists, is organized into 6 sections. Topics covered include basic science of the nicotinic receptor pathway; first-line, second-line, and novel medications; behavioral therapy; special populations; pharmacogenetics; neuroimaging; and future research subjects and treatments for nicotine dependence. Each chapter is written by an expert or experts in the field and includes its own abstract, introduction, and conclusions. Though there is some overlap of information in the chapters' introductions, this format may help the reader target sections that

will be most informative, depending on the reader's goals, which may be research-oriented versus patient-care directed.

The first section is on the basic science and provides a foundation to understand the pharmacology and physiology of the effects of nicotine on nicotinic receptors. This very detailed section explains the medications' mechanisms of action, which are further discussed in later sections. The first chapter describes the interaction between nicotine and the various subtypes of nicotinic receptors, and then details the signaling pathways by which nicotine acts in the peripheral and central nervous system. Animal models of nicotine addiction that can be used to better understand human addiction to nicotine and to develop and evaluate candidate medical therapies for nicotine addiction are also described.

The second section reviews first-line medications, including nicotine-replacement therapy and sustained-release bupropion. Varenicline, which has since gained Food and Drug Administration approval for smoking cessation, is covered in the later section on novel therapies. The second section discusses the pharmacokinetic properties of these treatments, summarizes results from clinical trials, and provides practical information such as the pros and cons of the various forms of nicotine-replacement therapy and questions that help screen for contraindications to bupropion.

The section on second-line treatments provides great detail on tricyclic antidepressants, monoamine-oxidase inhibitors, and opioid antagonists. This level of detail may be more than most in a general audience need, so this section might serve as a reference resource to address questions that arise with patients who have either failed first-line therapy or for smokers considering a second-line agent for another indication.

The fourth section covers several novel medication treatments that are either in various stages of development or are currently approved for other indications. These treatments include nicotine vaccines, GABAergic (gamma-aminobutyric acid) agents (eg, baclofen, tigabine, topiramate), cannabinoid antagonists (eg, rimonabant), and medications that target the dopamine D3 receptor pathway. Varenicline, an $\alpha 4\beta 2$ nicotinic acetylcholine receptor partial agonist that has since been FDA approved for smoking cessation, is covered in the last chapter in this section. However, this chapter does not contain as much practically useful informa-

tion compared to the chapters on other first-line therapies. This is unfortunate, as therapists and clinicians may be especially interested in some of the practical aspects of working with a new medication, but this information was likely unavailable at the time the book was written.

The special-topics section includes the integration of behavioral therapies with pharmacologic therapy, special populations such as psychiatric patients and those with substance-abuse disorders, pharmacogenetics, and neuroimaging. The section on behavioral-therapy may be especially useful to respiratory therapists and some other clinicians. This chapter highlights the importance of the smoking-cessation message from a health-care provider for increasing the effectiveness of smoking-cessation therapy and provides some concrete examples of simple behavioral interventions, which are clearly outlined in tables and bullet lists. The chapter about treating psychiatric patients and those with coexisting substance-abuse disorders is also likely to be of interest to those focused primarily on patient care. This chapter details considerations pertaining to several specific disorders and reviews the scientific literature about nicotine-replacement therapy and sustained-release bupropion for each condition. The chapters on pharmacogenetics and neuroimaging describe advances that will be most relevant to researchers.

The concluding section provides an outlook for future research suggestions and approaches to treating nicotine dependence. This section addresses specific subpopulations and the potential to integrate genetic and imaging advances into the development of future therapies.

Though **Medication Treatments for Nicotine Dependence** is expansive in its coverage of the pharmacologic background of nicotine addiction treatment, it may not be practically useful for many therapists or other clinicians. However, it can serve as an excellent reference to address questions about the mechanism of action or the pharmacologic rationale for a given therapy. The book is well-organized, so it will be useful as a reference.

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Pulmonary Embolism, 2nd edition. Paul D Stein MD. Malden, Massachusetts: Blackwell Futura. 2007. Hard cover, illustrated, 476 pages, \$124.95.

Paul Stein is best known as the researcher behind the Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED) I, II, and III studies. Those who search PubMed for articles about pulmonary embolism will no doubt encounter the name of this prolific author. He has used his vast knowledge and perspective to organize his definitive text, **"Pulmonary Embolism."** In this long-awaited second edition he builds on the knowledge base regarding this common and yet often misdiagnosed condition.

Do we need another textbook in this era of bedside Internet searches and ready access to online resources such as *UpToDate*? In my opinion, yes. Providers often have inadequate time to wade through an exhaustive online search for detailed information about risks, diagnostic strategy, or treatment of this important disease. This text fills a gap in the knowledge-base of the physician, nurse, or therapist who cares for patients with pulmonary embolism. By using a clear and organized format with many graphs and diagrams, Stein provides detailed information beyond the scope of an online review, but in a readily searchable and easily accessible format.

The volume is divided into 4 parts. The first is devoted to the prevalence, risks, and prognosis of pulmonary embolism and deep venous thrombosis. The chapters are focused and quite manageable for the busy clinician. Each has a clear derivation from the published literature. There are interesting topics, ranging from old classic concepts to new descriptive epidemiology. The subjects include air travel and the risk of pulmonary embolism and deep venous thrombosis, estrogen-containing oral contraceptives and pulmonary embolism risk, and venous thromboembolism in patients with cancer. Stein uses clinical epidemiology to illuminate other pulmonary embolism risk factors that provide the reader with further perspective on this disease. There are unique discussions on venous thromboembolism in the 4 seasons (no variation in rate of diagnosis or mortality), and regional differences in the United States rates of diagnosis of pulmonary embolism and deep venous thrombosis

and mortality from pulmonary embolism (the western region has the lowest incidence and mortality). He also looks at the incidence of thromboembolism in Native Americans, including Alaskans, and Pacific Islanders (all lower than whites).

A brief section that compares the diagnostic process in African-American and European-American patients reveals that although the death rate among African Americans with pulmonary embolism was higher, there was no evidence of withholding of key diagnostic testing, such as ultrasound or ventilation-perfusion scan, and no difference in duration of hospitalization from 1979 to 1999. Stein discusses the challenge of separating race from socioeconomic divisions and the importance of post-hospitalization access to primary care.

The next chapters delineate the risk and impact of pulmonary embolism and deep venous thrombosis in various disease states: heart disease, stroke, chronic obstructive pulmonary disease, asthma, sickle cell disease, pregnancy, obesity, and hypercoagulable states. Each of these chapters succinctly reviews the data and presents in user-friendly format the increased risk or unique interaction of the specific disease and thromboembolism.

Part 2 is dedicated to the diagnosis of deep venous thrombosis. Stein starts with the clinical assessment of deep venous thrombosis: the symptoms and signs and their importance. He documents the utility of various clinical prediction scoring systems, the use of D-dimer testing, either alone or in combination with other data, and then elucidates the predictive values of various imaging modalities used to test for deep venous thrombosis. This discussion ranges from the older accepted standard, venography, to now-more-commonly used modalities such as compression ultrasound. He also reveals preliminary data from the literature regarding the utility of magnetic resonance angiography and the more frequently used computed tomography (CT).

The chapter on the use of CT for diagnosis of deep venous thrombosis is remarkably detailed. In addition to providing evidence of efficacy of the technique, Stein documents the technical methods employed by the investigators (page 171): "Forty milliliters of iohexol diluted with 200 mL of saline was injected via a Y adapter... at 4 mL/s, using a power injector." As one of the investigators in PIOPED II, he is able to give a "behind-the-scenes" view of the tech-

niques used in the CT venography portion of the study, such as how the testing was tailored to reduce the radiation exposure of subjects.

These 2 sections pave the way for the discussion of what many diagnosticians find the most challenging problem: the diagnosis of acute pulmonary embolism. With the rapid proliferation of new technologies for the evaluation of pulmonary embolism, physicians, nurses, and therapists are challenged to sort the different laboratory and radiographic tests into a cohesive diagnostic plan. The next 193 pages are divided into 44 chapters that detail the multiple facets of this clinical situation.

Stein first addresses the individual aspects of diagnosis, starting with the history and physical. The next 7 chapters address some of the most challenging and lowest-yield diagnostic tests for pulmonary embolism: electrocardiogram, chest radiograph, arterial blood gas values, alveolar-arterial oxygen difference, fever, leukocytosis, and alveolar-dead-space measurement. He collates the world's literature on each test and leaves the reader with a clear understanding of the utility of these diagnostic tests, often showing how unhelpful these readily available tests are in definitively excluding or including the diagnosis of pulmonary embolism. The section continues with discussion of the role of D-dimer testing, clinical prediction rules, such as the Wells and Geneva scores, and other less-used laboratory tests (eg, plasminogen activator level).

Then Stein presents an analysis of the myriad radiographic techniques used to make the diagnosis of pulmonary embolism. After a brief chapter on the utility of bedside echocardiography in the diagnosis of normotensive and hypotensive patients with suspected pulmonary embolism, Stein embarks on a historical journey, detailing the technique of ventilation-perfusion (\dot{V}/\dot{Q}) imaging, the criteria for \dot{V}/\dot{Q} interpretation prior to PIOPED I, and how that changed with the PIOPED study. Stein continues by detailing the criteria for low probability and the interpretation of \dot{V}/\dot{Q} testing in patients with cardiopulmonary disease.

Stein proceeds logically into a brief chapter on the techniques for pulmonary angiography, and then spends many pages detailing the use of CT angiography, this time using PIOPED II as the transition point. He then describes the methods of the PIOPED II study, how they evaluated the combination of CT angiography with CT venography in

the diagnosis of pulmonary embolism. This study used a complex composite reference standard to exclude pulmonary embolism.

The goals of PIOPED II were to investigate if CT angiography can reliably detect and exclude acute pulmonary embolism and if adding CT venography improves the reliability. To be diagnosed with pulmonary embolism a patient had to have one of: high-probability \dot{V}/\dot{Q} scan (with no prior history of pulmonary embolism), positive pulmonary digital-subtraction angiogram, or positive venous ultrasound (with no prior deep-vein thrombosis at the site of the compression defect). Exclusion of pulmonary embolism required one of the following: negative digital-subtraction angiogram, normal \dot{V}/\dot{Q} scan, or a low-probability \dot{V}/\dot{Q} scan with a clinical Wells criteria < 2 and negative venous ultrasound.

The PIOPED II group determined that CT angiography had good positive predictive value in association with high-probability and intermediate-probability clinical Wells scores, but not in association with low-probability Wells score. The contrapositive also held true: CT angiography had excellent negative predictive value in association with low-probability and intermediate-probability Wells scores, but not in association with a high-probability Wells score. Stein included an extremely useful and practical pre-test and post-test probability chart that uses Bayes theorem and likelihood ratios derived from the study.

A brief chapter on the use of magnetic resonance angiography for the diagnosis of acute pulmonary embolism follows and leads naturally into a chapter on integrating diagnostic testing into a cogent diagnostic approach. In this final chapter of the diagnosis section the flow diagrams show clear approaches to evaluating a patient with suspected pulmonary embolism.

The third section, on treatment and prevention, begins by outlining the various anticoagulants available and their biochemistry. Stein discusses the prevention of venous thromboembolism in various disease states and then the treatment of venous thromboembolism, which is extracted directly from the Seventh American College of Chest Physicians Conference on Antithrombotic and Thrombolytic Therapy.

The next few chapters tackle the challenging and controversial topic of thrombolytic therapy in acute pulmonary embolism. The few studies that provide guidance are outlined and put forth as potential evidence.

Stein does a nice job of explaining the challenges of using intermediate end points in the assessment of efficacy.

Despite this text's thorough and comprehensive approach to pulmonary embolism, there are a few sections that could have been more rigorous. It is apparent that Stein's interest lies in the diagnosis of the disease. The section on therapy is unfortunately brief, as was the discussion of thrombolytic therapy, and both topics are of critical importance to practicing clinicians. Other than this small flaw, the book is a great desktop reference, and a key starting point for any investigation into the risks factors and diagnosis of pulmonary embolism. Stein is clearly one of the world's experts, and this far-reaching volume is a pleasure to read.

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Computed Tomography and Magnetic Resonance of the Thorax, 4th edition.

David P Naidich MD, W Richard Webb MD, Nestor L Müller MD PhD, Ioannis Vlahos MB, and Glenn A Krinsky MD. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins. 2007. Hard cover, illustrated, 897 pages, \$149.

This book encompasses the full spectrum of thoracic imaging. Perhaps a more fitting title would be "Everything You Ever Wanted to Know About Thoracic Computed Tomography and Magnetic Resonance Imaging: An Illustrated Version." The authors present a current and in-depth analyses of thoracic imaging. The material is written clearly and all aspects of imaging are addressed. There are detailed discussions of techniques and protocols, and an emphasis on the appropriateness of the techniques in various clinical settings. Detailed imaging features are provided for numerous disease processes, and the text is accompanied by more than an ample number of images. Both medical and surgical treatments are discussed, accompanied by appropriate images. The advantages and limitations of computed tomography (CT) versus magnetic resonance imaging (MRI) are discussed for var-

ious disease processes and clinical indications, and the rationale for the appropriate application of either MRI or CT in a given disease process is thoroughly explained. Radiological appearance is traced from illness-onset through clinical outcomes. Useful radiological signs accompany the numerous figures and illustrations

This is a useful reference and education tool for radiologists and other physicians using thoracic imaging, at all levels of training and practice. The text is divided into 10 chapters. Six are dedicated to thoracic structure, defined organs, and associated disease processes. Four chapters pertain exclusively to lung disease. Each chapter is further divided into sections that detail imaging techniques, normal anatomy, and pathology. Both acquired and congenital disease processes are presented. A thorough clinical presentation is provided, followed by radiological findings. Contrasting imaging modalities are then discussed, including diagnostic pitfalls and emerging techniques. The chapters are compiled uniformly, with appropriate expansion about important subjects. For example, in Chapter 2, which contains 145 figures and illustrations, 1 table, and 348 references, there is a plethora of information on the aorta and branch vessels. There is a detailed description of CT technique, scan parameters, contrast administration, and triggering methods. For MRI there is list of available sequences and description of optimization of gadolinium-enhanced 3-dimensional magnetic resonance angiography (including coil selection, patient positioning, and examination timing). This is followed by in-depth discussion of reconstruction techniques and possible pitfalls. Normal anatomy of the aorta is followed by a review of the clinical features of and treatment options for congenital and acquired aortic diseases. Medical and surgical options are discussed, including advances in surgical techniques. Post-surgical appearance of various lesions is also discussed.

Chapter 3 is an overview of pulmonary arterial disease. A description of normal anatomy is followed by a thorough discussion of arterial obstruction, including acute embolism and chronic thromboembolism-related hypertension. The section on acute pulmonary artery embolism is particularly well written and includes clinical presentation and the rationale for choosing the appropriate diagnostic modality. Special care for pregnant patients is discussed. The controversial issue of subsegmental pulmonary emboli and negative CT studies are addressed, and data from the Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED) II study are incorporated. The sections on imaging technique discuss possible pitfalls in image acquisition, display, and interpretation.

Chapter 6 addresses focal lung disease, with emphasis on pulmonary nodules. Issues of nodule detection, image characterization, and therapeutic management are well addressed. Attention is paid to nodules overlooked on CT because of technical and perceptual errors. The section on nodule characterization focuses on morphologic evaluation, primarily on CT. Emphasis is placed on ground-glass versus mixed versus solid attenuation. Calcification, lipid content, cavitation, contour, size, location, and contrast enhancement are all addressed in detail with regard to the likelihood of malignancy. In addition, the role of MRI and positron emission tomography is reviewed. Growth characteristics, as predictors of biologic behavior, and measurement variations in nodules juxtaposed to other surfaces or inspiration artifacts are explained. The section on management provides various diagnostic approaches relative to node dimensions, and special biopsy strategies. The chapter concludes by discussing the future role of computer-aided detection, characterization, and measurement.

Chapters 2, 3, and 6 illustrate the wealth and depth of information presented in this

book. The photographs are of the highest quality. The excellent color images augment the text and will improve readers' understanding. The tables distributed throughout the text concisely summarize imaging features and important radiological and clinical findings. The chapter bibliographies are thorough and include important clinical and radiological studies that support the book's assertions. Note that this is not a quick-reference book; it requires thorough and focused reading.

We found a few flaws and omissions, which primarily relate to the timing of when the book went to print, perhaps for the next edition. For example, there is no reference or discussion of gadolinium administration in patients with renal failure, and the consequent risk of nephrogenic systemic fibrosis. Also not discussed is positron emission tomography for lymphoma follow-up and to differentiate between post-therapy fibrosis, residual tumor, and recurrent disease. Then again, this is a CT and MRI (not positron emission tomography) textbook. A few of the images are not of high quality, such as those of mediastinal masses, which perhaps are from an older-generation CT scanner. However, none of these issues have major bearing on the overall quality of the book.

In summary, this book provides a comprehensive and systematic review of cardiopulmonary imaging, and is a valuable educational reference and an important resource for training and practicing radiologists and cardiopulmonary physicians.

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