Introducing *Radiology* Select Volume 1

Dear *Radiology* Select Reader:

With this volume, we are pleased to introduce *Radiology* Select: *Pulmonary Nodules*, the first in a new series we are offering. Each volume in the series will consist of 20–35 articles on a topic of clinical importance. The articles have been selected by experts serving as guest editors of the volume, from the past 5–8 years of material published in *Radiology*. We believe that this collection of key articles will be a valuable resource for individuals with subspecialty expertise or general readers who wish for an in-depth review of the area. Having the key articles together will allow the reader to identify the relationships between articles and to follow the development of trends in research and clinical care over time. We hope that these collections appeal to both radiologists and clinicians. We named the series *Radiology* Select because the verb *select* reflects the active choice of articles, and as an adjective, connotes their special value and excellence. We plan to offer *Radiology* Select on focused areas of imaging once or twice a year.

The process for developing these collections begins with the choice of an important area of clinical research that has been a subject of active investigation and ongoing development. We then select an appropriate guest editor, an internationally recognized authority on the topic. This individual typically will be a prolific author of articles on the topic, and thus there may be articles by our guest editor(s) contained within the collection. The guest editor and his or her chosen co–guest editors have the difficult task of appraising the original research and review articles for inclusion in the collection. Selections are based on the guest editors' judgment, so the list is, of necessity, somewhat subjective. The contents of the volume reflect a somewhat personal view of which are the key articles—they are not the result of a quantitative determination. Furthermore, it must be recognized that *Radiology* has published many more fine articles on the subject area than can be condensed into a 20–30–article volume. Some excellent and clinically important articles may therefore be passed over and not included.

Continuing medical education (CME) is an increasingly important aspect of clinical practice in radiology. Recent American Board of Radiology diplomates, in addition to needing CME, also need self-assessment modules (SAMs) for recertification. We believe that *Radiology* Select offers a perfect venue to provide up-to-date CME to our readers and will help them better understand how research evolves and translates into clinical practice. Therefore, our guest editor(s) will identify key themes of the articles, group them by subject area, and indicate the subject areas that they think will be valuable as SAMs. The articles' corresponding authors are then contacted and asked to supply questions for CME and SAMs. In this first volume, readers can obtain up to 10 SAM and 15 CME credits, allowing for focused learning in subject areas of clinical importance.

The online era provides multimedia opportunities for publications. We will exploit this capability by providing audio and video conversations with authors to explore their views on the effect of their work and the work of others in the field with the benefit of hindsight. These conversations will also allow experts to share their thoughts on future developments and the impact of their work on these. In this volume of *Radiology* Select, guest editor Alexander A. Bankier, MD, PhD, has conversations with several groups of authors to discuss the subject area of pulmonary nodules.

In keeping with the trend of increasing reliance on electronic publishing, we are offering *Radiology* Select in three formats: HTML on the Internet, a digital tablet edition, and print on demand. Print on demand is a printed compilation of the articles for those who prefer reading hard copy. The tablet edition is an electronic multimedia document that combines the electronic articles with audio and video; the articles have been formatted to allow viewing on tablet computers such as the Apple iPad and the numerous Android-powered devices. Images can be resized and compared in this format. We also offer an HTML version for viewing with a Web browser. Individual PDFs can be downloaded, and readers can listen to and view the audio and video conversations. The CME and SAM activities are available only through the online version.

We thank Dr Bankier and his fellow guest editors, Heber MacMahon, MB, BCh, and David P. Naidich, MD, for reviewing and selecting the articles collected in this volume. We are especially grateful to the authors of the articles, without whom *Radiology* Select would not be possible.

We believe *Radiology* Select will prove to be of educational value to our readers.

Sincerely,

Deborah Levine, MD, Series Editor, *Radiology* Select
Herbert Y. Kressel, MD, Editor, *Radiology*

Video
Online Education Edition and Tablet Edition of *Radiology* Select include a video with series editor Deborah Levine, MD.

Introducing *Radiology* Select: *Pulmonary Nodules*

Alexander A. Bankier, MD, PhD
Heber MacMahon, MB, BCh
David P. Naidich, MD

The widespread use of multidetector computed tomography (CT) in thoracic imaging has substantially increased the number of detected pulmonary nodules. At the time of their detection, however, many of these nodules are of unclear clinical relevance and often require further evaluation. This results in increased numbers of CT follow-up examinations, increased costs, increased amounts of radiation delivered to the patients, increased patient anxiety, and, last but not least, an increased workload for radiology departments.

The imaging of pulmonary nodules has always been a cornerstone of thoracic imaging. With the advent of greater anatomic coverage by modern CT scanners and the widespread use of combined thoracic and abdominal CT examinations, the topic of pulmonary nodules has gained additional importance for the radiology community at large. The detection of a pulmonary nodule tends to trigger the same practical questions: When should a given opacity be called a *nodule*? What are the implications of its detection? Does its morphology allow determination of a potentially malignant origin or transformation? Is further imaging follow-up of the nodule required? If yes, what are the appropriate technical requirements and recommendations for follow-up? How well are recommendations for nodule follow-up known and adhered to? What is their effect on clinical outcomes? What is the role of computed detection and analysis tools? Are there alternative or complementary techniques to CT for assessing pulmonary nodules?

Most articles included in this collection aimed, at least in part, to answer one of these questions. Unlike the snapshot view in time provided by a single journal issue, this collection offers a broader overview of the many incremental steps that have been made in an attempt to answer specific clinical or scientific questions related to pulmonary nodules. The collection, therefore, is not just a listing of relevant articles on pulmonary nodules published in *Radiology*. It is, rather, an "ensemble" of articles documenting the long-term and stepwise approach to this topic. Thematic and methodological interrelations between the articles are intentional, as they document how initial observations have been described, tested in preliminary series, validated in more confirmatory patient collectives, and finally integrated into clinical applications.

For example, initial observations on differences between benign and malignant pulmonary nodules (1) prompted a more refined morphologic perspective on pulmonary nodules with the definition of new nodule subcategories (2–4), the development of new technical approaches to assess these subcategories (5), and tests of the relevance of these subcategories in larger clinical trials (2,3,6). Likewise, earlier reports about potential limitations of observer performance and two-dimensional measurements of pulmonary nodules (7,8) resulted in investigations that addressed the multiple factors influencing observer performance and nodule measurements (9), led to the development of computed rendering and measurement tools designed to improve observer performance (10,11), and, finally, confirmed the accuracy and reliability of these tools in large cohort studies (12).

To allow easier navigation through the collection, the articles were grouped according to predefined topics.

The chapter "Anatomic and Morphologic Features of Pulmonary Nodules" groups articles on the morphologic features of pulmonary nodules and their diagnostic implications. The choice of articles for this chapter emphasizes relatively novel subcategories of morphologic nodule, such as subsolid (5), transient (13), and perifissural (2,3) nodules.

Video
Online Education Edition and Tablet Edition of *Radiology* Select include a video with Alexander A. Bankier, MD, PhD, Heber MacMahon, MB, BCh, and David P. Naidich, MD

The chapter "Detection, Observer Performance, and Technical Aids for Assessing Pulmonary Nodules" groups articles on nodule size and volume measurements (7,11), observer variability in nodule assessment, new display and rendering techniques (14), and the performance of computer-aided detection of pulmonary nodules (8,13,15). The somewhat wider scope of this chapter made the selection of articles particularly challenging, and reports of tangible findings and practical applicability were given preference over more technically or methodologically oriented articles.

The chapter "New Techniques in the Diagnosis of Pulmonary Nodules" groups articles on techniques such as dynamic contrast material–enhanced CT (16,17), dual-energy CT (18), and magnetic resonance imaging (19,20) that are likely to play an increasingly important role in the future imaging of pulmonary nodules. We attempted to ensure that the chapter equally represents each of these innovative imaging techniques.

The chapter "Guidelines and Recommendations for the Management of Pulmonary Nodules" includes both established (21) and newer preliminary recommendations for the management of pulmonary nodules (22). These recommendations are accompanied by articles on their utilization among radiologists, as well as articles about the common practices of radiologists when treating patients with pulmonary nodules (23,24).

Finally, the chapter "Screening for Lung Cancer" groups articles that deal with the various aspects of CT lung cancer screening, a topic that has received increased attention in the news media since the encouraging recent results of the National Lung Screening Trial (NLST) (25). However, the first attempts at using CT for lung cancer screening date from the late 1980s, and this chapter traces some of the iterative steps that led from early single-center studies in this field (26,27) to the monumental multicenter effort undertaken by the NLST (28). The inclusion of articles based on lung cancer screening programs performed outside of North America (12,29) is intended to further highlight the universal importance of this topic, and we anticipate that this chapter will receive particular attention from our readership.

A certain degree of overlap between articles was unavoidable, and several of the articles could have easily been included in two or more chapters. For example, an article dealing with automated measurements of subsolid pulmonary nodules seen in a lung cancer screening trial could have been included in the screening, morphology, or technical aids chapter. Whenever possible, however, we tried to identify the one core topic of an article and assign it to the according chapter.

The tactic of grouping articles according to thematic and methodological topics allows for a complementary perspective on this substantial body of scientific evidence. While the scientific quality of each article had originally been acknowledged by its acceptance for publication in our journal, the grouping of these articles will place recent reports into a more durable scientific context. Simultaneously, it may serve to rejuvenate interest in less recent articles by emphasizing the initial stimulus that they gave to the field by showing the development of this stimulus through articles that subsequently built on the earlier work. This longitudinal dimension in the presentation of previously published scientific reports, allowing for both a retrograde and an antegrade perspective on those articles, is probably unique to the format of this collection.

The format of this collection has two additional interesting features. The first is the inclusion of self-assessment modules (SAMs). Like the original chapters, these SAMs are thematically grouped. We believe that the structure of the SAMs will provide additional guidance for the systematic reading of individual articles. On a practical level, the SAMs will also allow our readers to acquire credits for maintenance of certification and continuing medical education. We hope that this will provide additional motivation for reading this collection while bridging potential gaps between research, education, and clinical practice.

The second feature is a series of conversations that will accompany this collection. Similar to the successful podcasts that are joined to each monthly issue of *Radiology*, these conversations will be available for download to our readers. While most of the monthly *Radiology* podcasts deal with a particular article in the current issue, the conversations accompanying this collection will instead deal with a group of articles or even with an entire chapter and will include more authors and a wider topic. This will allow discussion and exchange between diverse authors working on the same topic who may view this topic from different perspectives. In addition, it will allow the authors to describe their personal approaches to their research and to the work of other authors. We hope this feature will find a large audience among our readership.

This collection covers the years 2003 to 2010 and, for practical reasons, is limited to 32 articles. As a consequence, not all of the articles on pulmonary nodules published in *Radiology* during this time frame could be included. On a general level, we chose articles that made a difference in the way we think about pulmonary nodules, altered the way we diagnose and follow these nodules, and defined how imaging can influence treatment and outcomes. The articles included in this volume were, thus, selected on the basis of our perception of their overall effect on clinical practice and research. When on the fence between two articles, we favored the article with a larger number of patients and a prospective study design. Moreover, the number of citations as referenced in the Web of Science served as an additional decision factor. Ultimately, however, a part of our decision process was unavoidably subjective, and we are aware that many excellent articles had to be omitted.

The interests of the *Radiology* readership are highly diverse. While some readers look for high-end basic research and technical novelty, others look for practical and clinically applicable information. While some readers look for an intellectual impulse from innovative projects, others are more interested in the educational aspect of our articles. Finally, some will focus on distinct article formats, while others will enjoy the wide spectrum of these formats.

The current *Radiology* Select collection on pulmonary nodules was compiled for our entire *Radiology* readership. The multilayered format with the original articles, the thematic grouping of these articles, the paralleling structure of the SAMs, the educational aspect provided by these SAMs, and, finally, the spoken background information provided by the conversations should offer to each of our readers an appropriate entry into the vast field of the science of pulmonary nodules. Each reader will find his or her own path through this collection. We hope, however, that these many individual paths will lead to increased awareness of the issues related to pulmonary nodules, increased knowledge of the imaging strategies involved, and, ultimately, improved clinical care of patients with pulmonary nodules.

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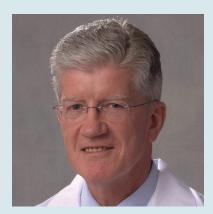18. Chae EJ, Song JW, Seo JB, Krauss B, Jang YM, Song KS. Clinical utility of dual-energy CT in the evaluation of solitary pulmonary nodules: initial experience. Radiology 2008;249(2):671–681.

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Alexander A. Bankier, MD, PhD

Alexander A. Bankier, MD, PhD, was born in Vienna, Austria. He graduated from medical school at the University of Vienna and received his training at the radiology department of his home university. He also completed fellowships in Lille, France, and Boston, Mass. In 2007, he permanently moved to Boston, where he currently serves as chief of functional respiratory imaging at the Department of Radiology, Beth Israel Deaconess Medical Center, Harvard Medical School. He is a deputy editor of *Radiology*.

Heber MacMahon, MB, BCh

Heber MacMahon, MB, BCh, received his MD degree from University College, Dublin, Ireland, and completed training in diagnostic radiology at the Mallinckrodt Institute of Radiology, Washington University, St Louis, Mo. After his residency, he joined the faculty at the University of Chicago, Ill, where he is currently professor and section chief for thoracic imaging. His research has been focused mainly on techniques for improved detection of lung cancer. He was elected president of the Fleischner Society in 2009 and was lead author of the Fleischner Society guidelines for management of small pulmonary nodules.

David P. Naidich, MD

David P. Naidich, MD, is professor of radiology and medicine at the New York University Langone Medical Center, where he has practiced continuously since 1980. He completed his residency and body imaging fellowship at the Johns Hopkins Hospital, Baltimore, Md. His main focus of research has been the use of CT for evaluating the entire range of pulmonary diseases, with particular focus on patterns of diffuse interstitial lung disease, lung nodules, and disease affecting the airways. He is an author or coauthor of numerous textbooks, including *High-Resolution CT of the Lung*. He is past president of both the Fleischner Society and the Society of Body Computed Tomography and Magnetic Resonance.