

## *Atlas of Nuclear Cardiology: Imaging Companion to Braunwald's Heart Disease*

Ami E. Iskandrian, MD, MACC, FASNC, FAHA, and Ernest V. Garcia, PhD, FASNC, FAHA, eds  
453 pages. Philadelphia, PA: Elsevier Saunders; 2012.  
\$179.00. ISBN: 978-1-4160-6134-2

The main purpose of an atlas devoted to a cardiac imaging technology is to teach using clinical images from real patients with accompanying text of a didactic nature. For an imaging technology, a comprehensive and well-illustrated atlas is a welcome contribution to teaching the principles and fine points of image analysis, diagnostic interpretation, and reporting. In this outstanding *Atlas of Nuclear Cardiology*, Iskandrian and Garcia and the other contributing authors successfully achieve the major goals of highly effective teaching via use of clinical images and accompanying text. The text of each chapter starts with a pertinent background section and ends with a Comments paragraph and Selected Readings, comprising references as current as 2011. This volume is intended to serve as a companion to *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*. It contains high-quality radionuclide images related to typical clinical cases encountered in cardiology. The color scale employed for the perfusion images, which ranges from yellow to orange to blue, is excellent and is the standard for the field. All of the contributors are well-recognized experts in the field of nuclear cardiology and provide the reader with a compendium of all major clinical applications of radionuclide imaging. A positive feature of each chapter is the bulleted list of Key Points. These are set right after the title of the chapter and serve to guide the reader to the main teaching points that are covered.

The atlas represents a good balance between highlighting the various technical aspects of nuclear cardiology imaging methodologies and explaining clinical applications through the use of case-based examples. For most of the myocardial perfusion single photon emission tomography (SPECT) images, both standard (short axis, horizontal long axis, vertical long axis) and quantitative (eg, polar maps) are displayed for the majority of the cases presented. The early chapters deal with the guidelines for interpretation of normal SPECT studies, with an outstanding description of image artifacts written by Dr. Gordon DePuey, a recognized expert in this area. The discussion in chapter 2 relates best practices for reporting nuclear cardiology studies and emphasizes awareness of guidelines and appropriate criteria for testing. This chapter goes well with chapter 5, which deals with the choice of stress testing modalities and includes examples of stress electrocardiograms and SPECT images obtained after regadenoson infusion. Chapter 4, "Radionuclide Angiography," still contains examples of first-pass rest and exercise radionuclide angiography, which are mainly of historical interest because these types of studies no longer are performed in patients with suspected coronary artery disease or for assessment of valvular regurgitation. Perhaps more discussion of equilibrium radionuclide angiography for the serial monitoring of left ventricular function in patients who are undergoing chemotherapy for malignancies would have been worthwhile.

Most of the remaining chapters are organized by clinical categories or by disease states. In the portion of the atlas containing case examples of patients with coronary artery disease, accompanying frames from coronary angiograms support well the

teaching points being emphasized. Chapter 7, which discusses serial testing, is well written and conveys, through the use of case examples, when serial imaging may be clinically useful as in previously imaged patients who experience a change in symptoms and patients who develop atypical chest pain after coronary revascularization. Appropriateness use criteria often are invoked in these case examples of serial imaging, which is valuable because serial imaging is costly and exposes patients to more radiation. Chapter 14, which discusses the evaluation of chest pain in the emergency department, covers the important role of stress-only imaging in low-risk patients, which reduces radiation dose, cost, and time in the hospital. Chapter 15, "Viability Assessment," emphasizes the use of rest and delayed thallium-201 redistribution imaging with superb examples. It does not include an example of a nitroglycerine-enhanced resting technetium-99m sestamibi scan for viability assessment, and there is not a discussion of positron emission tomography (PET) for F-18-fluorodeoxyglucose imaging for viability assessment. However, 2 PET viability cases are included at the end of chapter 20, entitled "Cardiac PET and PET/CT: Artifacts and Tracers". A strength of this chapter is the inclusion of examples of PET perfusion images obtained with the new tracer, F-18-flurpiridaz, which is now in phase 3 testing and is shows great promise for PET perfusion imaging. Of course, no PET chapter is complete without a description of PET imaging artifacts with patient examples. This is covered successfully in chapter 20 by Esteves et al. Omitted from the PET chapter is a discussion of the role of quantitative PET imaging of absolute myocardial blood flow and coronary flow reserve, which enhances the detection of coronary artery disease compared with standard PET imaging of relative tracer uptake. This will surely be included in the next edition of the atlas because large clinical studies showing the value of PET measurement of absolute flow and flow reserve have been published only recently.

The timely inclusion of the role of computed tomography for correction of attenuation and for noninvasive coronary angiography when used with SPECT or PET perfusion imaging will also be most appreciated by the reader of this atlas. Similarly, another example of the up-to-date nature of this atlas is the inclusion of a chapter by Ji Chen titled "Newer Tools for Assessment of Heart Failure." This chapter effectively demonstrates how systolic dyssynchrony can be measured on SPECT myocardial perfusion imaging employing phase analysis of gated images. In addition, this chapter covers the role of I-123 metaiodobenzylguanidine imaging of cardiac adrenergic nerves using SPECT technology.

A welcome addition to this atlas is chapter 19 about improving SPECT myocardial perfusion imaging efficiency and reducing radiation. This chapter introduces improvements in software technology and new gamma camera designs, as with the advent of cadmium zinc telluride solid-state detectors. Much attention recently has been directed at patients' exposure to radiation with nuclear cardiology procedures, and this chapter provides an excellent summary, with patient examples, of how radiation can be reduced in clinical imaging laboratories with the use of new SPECT technology. Certainly, more stress-only studies also contribute to reducing radiation exposure by eliminating a resting study if the stress scan is normal.

In summary, Iskandrian and Garcia have published a superb atlas of nuclear cardiology that has major teaching value in presenting representative cases of typical clinical scenarios accompanied by high-quality images. The Key Points at the beginning of each chapter are comprehensive and extremely valuable to the readers of this volume. These key points should be read before

and after reading the chapters. Thus, despite a few minor omissions, this *Atlas of Nuclear Cardiology* is a wonderful teaching tool for the field of nuclear cardiology. The authors should be congratulated on providing physicians who are involved in the practice of image analysis and interpretation on a day-to-day basis with such a helpful contribution to their professional education. I would also recommend that this atlas be situated in all academic nuclear cardiology laboratories for training programs.

None.

## Disclosures

**George A. Beller, MD**

*University of Virginia Health System  
Cardiovascular Division  
Department of Medicine  
Charlottesville, VA*

**Atlas of Nuclear Cardiology: Imaging Companion to Braunwald's Heart Disease**  
George A. Beller

*Circulation*. 2013;127:e246-e247

doi: 10.1161/CIRCULATIONAHA.111.089185

*Circulation* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

Copyright © 2013 American Heart Association, Inc. All rights reserved.

Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the  
World Wide Web at:

<http://circ.ahajournals.org/content/127/1/e246>

**Permissions:** Requests for permissions to reproduce figures, tables, or portions of articles originally published in *Circulation* can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the [Permissions and Rights Question and Answer](#) document.

**Reprints:** Information about reprints can be found online at:  
<http://www.lww.com/reprints>

**Subscriptions:** Information about subscribing to *Circulation* is online at:  
<http://circ.ahajournals.org/subscriptions/>