Foreword

When I was asked to write a foreword for this remarkable cardiology board review book, I could not help but hark back to the time when I finished my cardiology training half a century ago. Our knowledge base and our ability to treat patients with cardiovascular diseases were so limited then. Our board exams consisted of a written part with only multiple choice questions and a clinical exam in which we worked up and—with considerable trepidation—presented patients to some of the most distinguished clinicians in American cardiology. Computers and high tech were still years away. The avalanche of amazing advances in the diagnosis and treatment of heart disease was just beginning.

Fast forward to today. Current cardiology board examinations are administered using a computer terminal with complex multiple choice questions, often accompanied by high resolution images of not only electrocardiograms and x-rays that were the mainstays of diagnosis 50 years ago, but also dynamic images of coronary arteriograms, echocardiograms and other techniques currently used in the diagnosis of cardiovascular diseases. Therapy has also become ever more complex—from pharmacology to interventions to medical devices to guidelines.

The increased emphasis on board examinations for initial certification coupled with the need for periodic recertification poses a big challenge for the test-taker, given the incredible breadth of knowledge that is now required to pass the board examinations. Compounding the problem is the further subspecialization within the specialty of cardiovascular diseases itself. Indeed, while in the course of a busy day, a cardiologist may encounter a broad range of important problems represented on the examination, there are many topics in cardiology which he or she may not frequently face. As examples, the general cardiologist may not easily decipher the intracardiac electrograms that are second nature to the electrophysiologist. Pediatric cardiologists adept in complex congenital heart disease (a topic that instills fear in the hearts of many board-takers) may not have much experience in the management of acute coronary syndromes. Yet wherever one finds his or her niche in cardiology there is a level of knowledge encompassing the whole breath of cardiovascular diseases that one is expected to possess. That is what the board examinations are all about.

Getting ready for the board examinations requires the diligent use of available board preparation resources. It is in this context that I am so enthusiastic about the publication of the Massachusetts General Hospital (MGH) Cardiology Board Review Book by Drs. Gaggin and Januzzi, Jr. of our Division of Cardiology. Representing contributions by a broad array of the best and brightest from our Division, this comprehensive review book has a concise, easy-to-read, visually appealing layout that will assist both those who are taking the boards initially as well as those seeking recertification after many years of practice. The authors and editors are careful not to overwhelm the reader with irrelevant information so commonly found in board review books, some of which are as long as a standard cardiology textbook. Indeed the contents of this book are designed to contain the most important, most pertinent and most often tested topics in each subject—essentially, what the authors and editors believe the reader needs to know in order to pass the board examinations. Furthermore, the inclusion of a multi-media format—easily accessed from the publisher’s website—that displays video
loops of coronary arteriograms, ventriculograms and echocardiograms corresponding to still images in the textbook simulate the actual experience of taking the boards, and adds an extra dimension that is lacking from most board review books. And importantly, the added value of multiple choice questions designed by people who recently sat for the exams further enhances the value of this book for board takers.

It gives me great pride to see the name of the MGH Cardiac Division on this book. Since the Division was founded by Dr. Paul Dudley White in 1917, the MGH has enjoyed a rich tradition of excellence in the practice and the teaching of clinical cardiology. Dr. White’s single-authored textbook—*Heart Disease*—first published in 1931 was the definitive reference text in cardiology for many years. Subsequently the MGH Cardiac Division published a highly acclaimed textbook—*The Practice of Cardiology*. Numerous members of the MGH Cardiac Division have either published or contributed to textbooks in cardiovascular diseases. This Board Review Book edited by Drs. Gaggin and Januzzi, Jr. is an important new educational resource, and adds further luster to the long tradition of the MGH for excellence in clinical teaching.

Roman W. DeSanctis, M.D.
James and Evelyn Jenks,
Professor of Medicine, Harvard Medical School
Physician and Director of Clinical Cardiology Emeritus,
Massachusetts General Hospital,
Boston, MA, USA
Preface

It has been quite a journey—from the inception of this book’s concept while a fellow at the University of Pittsburgh Medical Center 5 years ago to working with the fearless authors at Mass General who took on this challenge, and now the submission of the completed book.

All I can think of are the people who made this possible. Dr. James Januzzi, Jr. my super mentor and co-editor, and Dr. G. William Dec, for bringing me into Mass General and supporting my ambitious concept with all their resources. All the authors of this book who worked tirelessly, sometimes edits after edits, to make it of quality and of substance. It was my pleasure to have gotten to know them and their dedication to education through this book. Drs. Doug Drachman, Eric Isselbacher, Randy Zusman, Igor Palacios, Ik-Kyung Jang, Quynh Truong, Rory Weiner and Aaron Baggish for their advice and for being the first brave ones to sign up for the book.

I can’t thank enough Drs. Barry London and Mike Mathier from UPMC who entrusted me with the Board Review Conference. Dr. John Gorcsan for opening my eyes to the art of research and presentation whose teachings on organization of material for learning I have used again and again. Drs. Fred Crock, Mark Schmidhofer, Prem Soman, Jenifer Lee, Bill Katz and the great late Jim Shaver for always being available. Too numerous to name, all the fellows and faculty members at the University of Pittsburgh Medical Center who contributed to the Board Review Conference.

Everything I learned, I learned from Drs. Robert Vorona and J. Catesby Ware at the Eastern Virginia Medical School. I always strive to emulate their work ethic, character and compassion.

On a personal note, I have to credit my mom, Hee Jung Kim, for making sure that I pursue what I love and for being the wisest, strongest woman I know. My sisters, Han Holmberg and Dr. Amy Pollak for always giving me the brutal truth. My very special angels, Ruth and Jim Clark—their sense of curiosity, adventure and philanthropy are inspirational. My best friends, Drs. Ranjith Shetty and Mattie Campbell for making sure that I appreciate life outside of work.

But above all, I would like to thank my ultimate partner-in-crime and love, Robert T. Gaggin. I didn’t know such a wonderful, amazing person existed. I will work hard to make you proud.

Boston, MA, USA

Hanna K. Gaggin, MD, MPH

It is a marvelous thing to teach. An effective teacher leaves an indelible mark on the student, and can result in a profound effect on a person’s career. I remember exact lessons taught to me by my first mentor and physician/teacher—my father—even before I went to medical school, while some of the most powerful bedside physical diagnosis lessons taught to me by Dr. Jack Chadbourn in medical school, Dr. Eugene Braunwald in residency, or Drs. Roman DeSanctis and Dolph Hutter during fellowship similarly remain with me years later. These powerful forces inspired me to teach—something that remains a major focus for my career. In parallel, I have also realized the importance of preparing for assessment exams such as the Cardiology Boards, thus it is in this context that I am so very proud to have worked with my
colleague Dr. Hanna Gaggin together with members from the MGH Division of Cardiology to write this important textbook.

I am grateful to all my colleagues that supported this effort—there is nothing more satisfying than coming to work every day surrounded by a group of peers that inspire me to work harder, learn more, and help patients on a daily basis. I would also like to recognize my Chief of Cardiology, Dr. G. William Dec, who enthusiastically supported this textbook. In addition, it goes without saying that I would like to thank my mentor, Dr. Roman W. DeSanctis, from whom I learned more clinical cardiology than most textbooks could ever teach.

Finally, to my daughters Caterina and Julianne, and especially my wife Roberta: thank you for endlessly supporting my dreams and my efforts—without you and your love and support, I would never be able to do what I do.

Boston, MA, USA

James L. Januzzi, Jr., MD, FACC, FESC
How to Ace the Boards

The cardiovascular board exam is expensive, often stressful and time-consuming. A well thought out preparation is especially important as you want to pass it the first time you take it! This is also a great opportunity to consolidate your experience and knowledge, brush up on rare disorders, while familiarizing yourself with the latest clinical practice guidelines. In this book, we have pooled the talents, expertise and teaching experience of the best and brightest at Mass General to help you do all of the above.

This book is not meant to be all-inclusive—there are several excellent text books for that—but rather, it is meant to be a primer for the highlights of the cardiology topics (including board-style questions, electrocardiograms [ECG] and imaging studies) covered in the Cardiovascular Disease Board exam for the busy clinicians and fellows. The inspiration for this book came from the board review course run by Dr. Gaggin while at the University of Pittsburgh Medical Center and the feedback from the fellows and faculty members who recently took the exam. Dr. Januzzi, Jr. is a frequent faculty member of board review courses and multiple clinical practice guideline committees, and has won many teaching awards for his role in the education of fellows and residents at Mass General. Importantly, Dr. Gaggin herself recently sat for the initial board exam in cardiology, while Dr. Januzzi, Jr. recently re-certified. Here are our thoughts on how to ace the boards.

1. Basic exam information
2. What’s new in 2012–2013
3. Exam tips
   4. The Plan when you have a year before your certification
   5. The Plan when you have a month before your certification
   6. When you are re-certifying—the basics.
   7. The Plan for your maintenance of certification.

BASIC EXAMINATION INFORMATION

■ You MUST visit the official American Board of Internal Medicine (ABIM) website first and obtain exact dates and requirements as they often change: (http://www.abim.org), get information by specialty, Cardiovascular Disease

■ Key dates, initial certification
   – Register early—as soon as registration opens up (typically March 1)—in order to get your first choice in testing center.
   ■ Registration deadline: typically May 1.
   – The examination is at the end of October/early November after completing clinical cardiology fellowship.
   – If you must cancel, make sure to do it within the designated time (typically September 1).
Key dates, re-certification

- Beginning in the sixth year of your certification you can schedule a seat for the exam.
- Importantly, you must be enrolled in the Maintenance of Certification (MOC) at least 2 weeks prior to the seat scheduling deadline.
- Exams are offered twice a year, typically in the Spring and Fall.
- Exams are offered at Pearson VUE Test Centers; you must register online in order to reserve a spot for the test.
- If you must cancel, you typically have until 11:59 PM EST 3 days prior to the exam.

NEW IN 2012–2013

The exam format and content has been changed in the multiple choice, ECG and Imaging Studies section.

- The multiple choice questions section now contains audio-based questions with heart sounds.
- The Imaging Studies section now only contains echocardiograms and angiograms.
- Ventriculograms and aortograms are covered under the multiple choice questions section.
- The answer options list has been updated and will look different also.

EXAM TIPS

A. The test

- **Initial certification format**: typically 50 questions per one 2-h session (there are four 2-h sessions total). 2.4 min/question. Time yourself. In addition, you must pass both the ECG/Imaging section and the multiple choice question sections in order to pass the board exam.
- **Maintenance of certification format**: similar to the initial certification format, but there is no separate ECG or imaging section—these are included in the flow of the exam.
- In the multiple choice questions section, you don’t get penalized for guessing, so do not leave any questions unanswered!
- A recent test composition was as follows:

<table>
<thead>
<tr>
<th>MEDICAL CONTENT CATEGORY</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrhythmias</td>
<td>13.0</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>12.5</td>
</tr>
<tr>
<td>Acute coronary syndrome</td>
<td>12.0</td>
</tr>
<tr>
<td>Valvular heart disease</td>
<td>12.0</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>5.0</td>
</tr>
<tr>
<td>Pericardial disease</td>
<td>4.0</td>
</tr>
<tr>
<td>Aortic/peripheral arterial diseases</td>
<td>9.0</td>
</tr>
<tr>
<td>Hypertension/pulmonary diseases</td>
<td>7.0</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>5.0</td>
</tr>
<tr>
<td>Heart failure</td>
<td>13.0</td>
</tr>
<tr>
<td>Physiology/biochemistry</td>
<td>6.0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1.5</td>
</tr>
</tbody>
</table>
Know where your weaknesses are, and expect there will be questions in that area. There is nothing more satisfying than getting lots of questions in a prior area of weakness that you prepared well in!

While there are no guarantees, there are certain things you can well-expect on the examination:

- You must know the latest American College of Cardiology (ACC)/American Heart Association (AHA) Clinical Practice Guideline recommendations.
  - There is heavy emphasis on Class I recommendations (what to do) and Class III recommendations (what not to do). If there is controversy about a topic, it will not be tested.
  - Good, old fashioned clinical evaluation is emphasized on the exam: know your history and physical (see Chap. 1 of this text), and know how the findings on history and physical tie in to management.

Don’t be discouraged by questions that seem out of nowhere. About 10% of the questions are new questions that are being explored for use and do not count toward your score.

B. Some thoughts about multiple choice questions:

- Get used to board-style exam questions, they are long-winded, and often have an extended “stem” that can mislead you from the real reason for the question.
  - More than 75% of questions are based on patient presentations, with the majority requiring integrating numerous aspects of the data presented—but not all of it!
  - Our advice is to read the question and the answers list first, then circle back to read the long description of the situation.

C. ECG section (for those taking the initial exam)

- We cannot emphasize how important it is to KNOW THE ANSWER OPTIONS LIST BY HEART that the ABIM provides on its website.
  - Download the Tutorial and the Answer Key. PAY SPECIAL ATTENTION TO THE ANSWERS AND THE SCORING OF SAMPLE CASES as they provide priceless insight into the way ABIM will score your ECG’s.
  - Know the answer options list by heart (how many times can we say this?), so you can rapidly find the diagnoses you seek.

- Format: typically 37 ECG’s in one 2-h session. 3.2 min/ECG. Time yourself.
- Most people fail the board exam because they failed the ECG section. The most frequent comment was that they ran out of time, usually because they wasted too much time looking for the location of the answer in the answer options list.
- You DO get penalized for overcoding or guessing in this section, so code only what you need.

D. Imaging studies section

- Similar to the ECG section. Know the Answer options list.
- Format: typically 39 cases in one 2 h and 15 min session. 3.5 min/case. Time yourself.
- You DO get penalized for overcoding or guessing in this section, so code only what you need.

E. Audio-based heart sounds

- Practice, practice, practice.
- Know your maneuvers to differentiate between heart murmurs (see Chap. 1 of this text)
WHAT TO STUDY WHEN YOU HAVE A YEAR: A CHECK LIST FOR INITIAL TEST-TAKERS

- Study materials
  - *MGH Cardiology Board Review book*
  - *ACCSAP* (comprehensive but lengthy. Great if you have the time.)
  - Braunwald’s Heart Disease, a textbook of cardiovascular medicine (A great text book, pay special attention to the sections on ACC/AHA guidelines)
  - Michael J. Barrett’s Heart Songs audio (Basic, Intermediate and Complex) available through Cardiosource

- Multiple choice questions: we are big believers in the importance of getting into the swing of test taking, so practice tests are crucially important.
  - *Questions and Answers sections from the MGH Cardiology Board Review book*
  - *ACCSAP* (Essential for the well-written, accurate practice exam questions. Very similar to the actual ABIM question format)

- ECG
  - Chapter 36 of the *MGH Cardiology Board Review Book*
  - *ECGSAP* (its scoring system gives you an insight to the way ABIM will score, especially for penalties for overcoding, but the system is a little different from ABIM)
  - ABIM Answer Options List
  - Podrid’s Real World ECGs by Philip Podrid et al

- Imaging Studies section
  - Multimedia website and Chap. 35 of the *MGH Cardiology Board Review Book* that includes almost all the diagnosis from the ABIM Answer Options list.
  - Still images from the Mayo Clinic Cardiology: Concise Textbook (The book itself is great, but it is NOT concise: the 3rd edition is 1584 pages long)
  - ABIM Answer Options List

- Consider attending the Mayo Cardiovascular Review Course
  - A week-long intensive course in late September/early October, Rochester, MN (expensive and time-consuming, but it’s worth it. Extremely well organized and taught)

WHAT TO STUDY WHEN YOU HAVE A MONTH: A CHECK LIST FOR INITIAL TEST TAKERS

- *MGH Cardiology Board Review book* and its multimedia website for the moving images for the imaging section as well as practice questions
- The Complete Guide to ECG’s by James O’Keefe
- *ACCSAP* practice examination questions and answers
- Consider Mayo Cardiovascular Review Course
- Michael J. Barrett’s Heart Songs audio (Basic, Intermediate and Complex) available through Cardiosource
WHEN YOU ARE RE-CERTIFYING

Subspecialists certified in 1990 or later must complete the Maintenance of Certification (MOC) program, which includes 100 MOC points of self-evaluation plus the examination.

The enrollment fee includes one secure examination and access to an unlimited number of self-evaluation products.

THE PLAN FOR YOUR MOC

Begin your MOC early. You must complete the 100 points by the time you sit for the exam. You acquire these points by completing self-evaluations from two categories:

- Self-Evaluation of Medical Knowledge: open-book modules that test clinical practical knowledge.
- Self-Evaluation of Practice Performance: modules that focus on practice improvement, which may include the American Board of Internal Medicine Practice Improvement Modules.

You must start your MOC early! These modules take time, so do not wait until the last minute to start the modules—in the midst of a busy career, you do not want to have to cram the MOC modules plus prepare for the examination!

Study materials

- *MGH Cardiology Board Review Book and its multimedia website for moving images and practice questions*
- *ACCSAP*
- Consider the Mayo Cardiovascular Review Course

As above, multiple choice questions are crucially important to get into the swing of things!

That’s it—happy studying, and we wish you all the best!

Boston, MA, USA
Hanna K. Gaggin, MD, MPH

Boston, MA, USA
James L. Januzzi, Jr., MD