

CLINICAL ECHOCARDIOGRAPHY REVIEW

A Self-Assessment Tool

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Design Coordinator: Holly McLaughlin
Production Service: Aptara, Inc.

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**Two Commerce Square
2001 Market Street
Philadelphia, PA 19103, USA
LWW.com**

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Printed in China

Library of Congress Cataloging-in-Publication Data

Clinical echocardiography review : a self-assessment tool / editors,
Allan L. Klein, Craig R. Asher.
p. ; cm.

Includes bibliographical references and index.

Summary: "The book focuses on the time tested way of "the Socratic method" to teach the key concepts to busy clinical cardiologists, fellows, anesthesiologists and sonographers using a multiple choice question & answer format. The book will emphasize diagnostic interpretation rather than clinical management. This book is comprehensive with chapters ranging from fundamentals to new technologies. The format of each chapter is standardized with 3 types of questions. At the beginning, there are simple questions followed by an answer. Then, questions associated with a still frame graphic (M-Mode, 2-D or a 3-D) come next and are followed by an answer. Finally, questions are presented involving case studies associated with several questions based on movies and still frames"— Provided by publisher.

ISBN-13: 978-1-60831-054-8 (alk. paper)

ISBN-10: 1-60831-054-X (alk. paper)

1. Echocardiography—Examinations, questions, etc. I. Klein, Allan L. II. Asher, Craig R.

[DNLM: 1. Echocardiography—Examination Questions. 2. Heart

Diseases—ultrasonography—Examination Questions. WG 18.2]

RC683.5.U5C567 2011

616.1'207543076—dc22

2010031605

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10 9 8 7 6 5 4 3 2 1

ACKNOWLEDGEMENTS

We would like to thank Marilyn, Jared, Lauren, Jordan, Jean and Sam Klein and Diann, Drew, Laura and George Asher for their encouragement during our careers and support while editing this book. We would especially like to thank Marie Campbell who put a lot

of effort into putting this book together. Finally we would like to express our gratitude to Wolters Kluwer, Lippincott Williams & Wilkins publishers, and in particular Frances DeStefano and Leanne McMillan, for their guidance in making this book a great success.

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FOREWORD

The field of cardiovascular ultrasound had experienced a progressive increase in technical capability and clinical application. The earliest texts on echocardiography dealt only with M-mode tracings, while the most recent versions include two- and three-dimensional imaging as well as blood and tissue Doppler recordings. Not surprisingly, the size of these texts has increased proportionately, representing a challenge to anyone who seeks to master every aspect of cardiac ultrasound. Not surprisingly, new approaches to teaching/learning echocardiography have been sought.

One of the time honored techniques for transmitting information in the clinical setting employs the Socratic method. Whether on rounds or in a laboratory or operating room, attending physicians traditionally pose questions to their trainees about the cases they are overseeing. The concept is that one will best remember that information which they were unable to provide in response to a question. This method also enables the teacher to assess the student and, importantly, enables the trainee to assess their own knowledge and direct future educational efforts.

The current text by Klein, Asher and coauthors exploits the attributes of the Socratic method as an educational tool for cardiac ultrasound. Each aspect of echocardiography is covered by a series of questions

which calibrates one's knowledge of the field. More importantly, the explanations of the correct answers provide new information in a format that will not likely be soon forgotten. Many of the questions are based upon actual images and recordings, simulating the setting in which this knowledge would be needed clinically. The net effect is to keep one's interest with challenging queries and immediately enforce the acquisition of new information.

There is little doubt that cardiac ultrasound will continue to progress and play an increasing role in clinical care. In addition, the availability of small handheld devices should expand the application of echocardiography to noncardiologists. Thus, there will be a continuing need for tools to transmit information and to enable self-assessment. The text by Klein, Asher and coauthors serves that purpose very well and is a welcome addition to the cardiac ultrasound literature.

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FOREWORD

In 1953, Swedish physician Dr. Inge Edler, using an industrial ultrasound device, generated the first images of the human heart and published his experience the following year in a manuscript entitled “The use of ultrasonic reflecto-scope for continuous recording of the movements of heart valves.” The next five decades have seen an unrelenting series of advances in the imaging modality, soon named “echocardiography” by its proponents. Amplitude mode imaging gave way to two-dimensional (2D) echocardiography, then 3D echocardiography, Doppler imaging, transesophageal imaging, contrast ultrasound, tissue Doppler, and much more. What began as an exercise in scientific curiosity eventually transformed the profession of cardiovascular medicine, becoming, without question, the most important noninvasive diagnostic technique used in the practice of cardiology.

However, with each passing decade, the challenges of mastering echocardiography have become increasingly daunting for each new generation of students and practitioners. The physicists who develop ultrasound equipment have been astonishingly creative, devising increasingly complex mathematical approaches to ultrasound imaging that empower practitioners with increasingly powerful diagnostic tools. However, the price we pay for technological advances are the formidable obstacles to learning how to apply echocardiography in clinical practice. Dr. Allan Klein and his coauthors, top leaders and educators in this field, have sought to make learning of echocardiography easier and, frankly, more fun.

This learning tool does not attempt to educate the reader in detail about the physics of ultrasound or the nuances of esoteric research. Rather, this text uses a more user-friendly approach based upon the “question

and answer” approach to education. Both educators and students, when interviewed, invariably favor such an approach. I own several textbooks of ultrasound that I keep next to my bed in case I suffer from insomnia. A few minutes of reading is usually all it takes for me to fall asleep. That cannot happen with the “Clinical Review of Echocardiography.” Using a question and answer format, the reader is engaged from the very beginning. The questions cover a range of difficulty that allows the beginner and advanced student to increase their knowledge and self-confidence. The problem-oriented learning is particularly appealing because it simulates the clinical environment so well that it is easy to forget that you are reading a textbook.

The topics covered range from the mundane to the esoteric, including basic imaging methods, such as systolic function assessment, as well as sophisticated areas such as optimization of cardiac resynchronization therapy. Although not a substitute for a comprehensive reference book, this textbook is ideal for review and re-certification. It is equally useful for individuals who want to assess their skills or increase their knowledge to keep pace with the advancing technology of echocardiographic imaging. Of equal importance, you will find that this approach is simply a fun way to learn. Once you start, you may have trouble putting this book aside.

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P R E F A C E

We are delighted with this new interactive and contemporary text book entitled *Clinical Echocardiography Review: A Self-Assessment Tool*. In 2011, echocardiography is seeing a major renaissance in interest and growth. We are now in the modern era of miniaturization, 3D and dyssynchrony echocardiography, speckle tracking, real-time TEE, and molecular imaging with contrast. At the same time, reimbursement for imaging is decreasing and there is competing technology. The busy clinician and fellow have to keep up with the latest in the changing clinical practice of echocardiography. This book focuses on the time tested way of “the Socratic method” to teach the key concepts to busy clinical cardiologists, fellows, anesthesiologists, and sonographers using a multiple-choice question & answer format. The book will emphasize diagnostic interpretation rather than clinical management.

This book is comprehensive with 28 state-of-the-art chapters ranging from fundamentals to new technologies. The format of each chapter is standardized with three types of questions. At the beginning, there are simple questions followed by an answer. Then, questions associated with a still frame graphic (M-mode, 2D, or a 3D) come next and are followed by an answer. Finally, questions are presented involving case studies associated with several questions based on movies and still frames. The reader will need to go to the Web site

to work with these questions in either study mode or test mode.

We have chosen leading national and international experts as well as educators in the field of echocardiography. We will cover the basics from a sonographer approach to the echocardiography examination, physics and artifacts to more clinically oriented topics including atrial fibrillation, prosthetic valves, cardiomyopathies, and pericardial disease and then new technologies such as dyssynchrony assessment, strain, and strain rate. We have emphasized key take home points after each of the cases. This book uses the question & answer method which is similar to how we teach our fellows to read echocardiograms. Also, it will be useful for the clinical cardiologist who wants to hone their echocardiographic skills in day-to-day practice.

Clinical Echocardiography Review: A Self-Assessment Tool may be the largest echocardiography review book out there with over 1,000 questions and answers as well as key references for each chapter. There are ample graphs, tables and figures, and detailed explanations to answer the questions.

We hope that you enjoy the basics as well as the “latest and greatest” of echocardiography in the 21st century.

Allan L. Klein and Craig R. Asher

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