

Eugenio Picano

# Stress Echocardiography

Sixth Edition

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Sixth Edition

 Springer

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## Preface

This book has a past. Its various editions and increasing diffusion parallel the growth of stress echocardiography within the scientific community and the clinical arena. The first edition in 1991 consisted of 100 pages, which gradually increased to more than 700 in this sixth edition.

Stress echocardiography is no longer a promising innovation used by isolated pioneers (i.e., desperate researchers surrounded by universal disbelief working with the technique at a time when it clearly could not work), but it is now an established, mainstream technique used every day, in every part of the world, by busy clinicians well aware of the huge potential of stress echocardiography to resolve the present paradox of saving health-care money while at the same time improving diagnostic standards. In a societal and economic climate of increasing pressure for appropriate, justified, and optimized imaging, stress echocardiography offers the great advantages of being radiation-free, relatively low cost, and with a staggering versatility: we can get more (information) with less (cost and risk).

For a long time, the scope and application of stress echo remained focused on coronary artery disease. In the last 10 years, it has exploded in its breadth and variety of applications. From a black-and-white, one-fits-all approach (wall motion by 2D echo in the patient with known or suspected coronary artery disease), now we have moved on to an omnivorous, next-generation laboratory employing a variety of technologies (from M-mode; to 2D and pulsed, continuous, color, and tissue Doppler; to lung ultrasound and real-time 3D echo, 2D speckle tracking, and myocardial contrast echo) on patients covering the entire spectrum of severity (from elite athletes to patients with end-stage heart failure) and ages (from children with congenital heart disease to the elderly with low-flow, low-gradient aortic stenosis).

The book was totally single authored in the first edition, up to the record number of 50 contributors in this edition. They come from 22 countries spanning four continents and represent, in my opinion, some of the best available knowledge and expertise in their respective fields. I am proud and honored that they have accepted the invitation to be a part of this project. At the same time, I aimed to avoid the fragmentation, gaps, and inconsistencies of a multi-author text; therefore, I drafted the first version of each chapter – then asked for corrections, revisions, cuts,

additions, and integrations from more knowledgeable contributors. To all of them and to the junior and senior colleagues who have worked with me over the last 35 years – far too many to be mentioned here – *grazie*.

Pisa-Astana  
2015

Eugenio Picano, MD, PhD

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# Videocompanion

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Maria Joao Andrade, MD

Quirino Ciampi, MD

Jorge Lowenstein, MD

*Video-director: Marco Paterni, Computer Scientist*

*Videoeitor-in-chief: Eugenio Picano, MD, PhD*

## **Stress echo Primer and tutorial (from Pisa stress echo school 2000)**

*Coronary artery territories and myocardial segments*

*Regional wall motion scoring*

*Stress echo signs*

*Index:* cases 1 to 7 (dipyridamole); case 8 (dobutamine and dipyridamole); cases 9–12 (dobutamine); cases 13–16 (ergonovine). Each case with clinical information and reading test

## **Illustrative cases**

- *Ischemic heart disease:* cases 1 to 8 (dipyridamole); case 9 and 10 (exercise); case 11 (dobutamine); case 12 (ergonovine). Maria Joao Andrade, Aleksandar Neskovic, Bogdan Popescu, Jesus Peteiro
- *The added value of coronary flow velocity reserve:* cases 13, 14, 15 and 16 (dipyridamole); 17 and 18 (adenosine). Ana Djorkievic-Dikic, Quirino Ciampi
- *The added value of new technologies:* case 19 to 25 (dipyridamole, coronary flow velocity reserve and 2-D strain map). Jorge Lowenstein
- *Special interest, heart failure:* cases 29 (exercise echo and diastolic dysfunction); case 30 (exercise and acute severe mitral regurgitation); case 31 (exercise echo and B-lines). Maria Joao Andrade
- *Special interest, valvular heart disease:* cases 32, 33, 34 and 35 (dobutamine echo and low flow, low gradient aortic stenosis: true severe aortic stenosis and pseudo-severe aortic stenosis). Maria Joao Andrade



- *Special interest, heart transplant*: case 36 (dobutamine and wall motion); case 37 and 38 (dipyridamole and coronary flow velocity reserve); case 39 (dipyridamole-transesophageal stress echo for aged donor heart recruitment); case 40 (trans-thoracic dipyridamole stress echo for aged donor heart recruitment). Layla Elif Sade (case 36, 37 and 38) and Tonino Bombardini (case 39 and 40)
- *Special interest, hypertrophic cardiomyopathy*: case 41 (exercise and left ventricular outflow obstruction in orthostatic position). Carlos Cotrim
- *Special interest, noninvasive pacing*: case 42 (noninvasive pacing and real time 3-dimensional stress echo). Edyta Plonska
- *When stress echo fails, stress CMR*: cases 43 to 45 (dipyridamole stress-CMR with wall motion and perfusion). Vicente Bodi-Peris

### **The way we were: Nuovo Cinema Paradiso remastered**

- *Myocardial viability: a moonlight serenade (1998)*- with Albert Varga (and Giuliano Kraft)
- *The roaring of the lamb (2000)* – with Albert Varga (and Giuliano Kraft)
- *Rocky Horror stress echo picture show (2002)* – with Albert Varga (and Giuliano Kraft)
- *A novel silver heart from National Research Council (2012)* – with Tonino Bombardini
- *Left ventricular contractility: from molecules to man (2013)* – with Tonino Bombardini (and Monica Zoppè - narrator voice, Ms Alison Frank)

### **Selected presentations (year):**

- Pharmacological and myocardial effects of adenosine and dipyridamole (2004)
- Stress echo: math and geography (2001)
- Stress echo reading: the doctor factor (2001)
- Stress echo and myocardial perfusion imaging: How I ate my father (2005)
- Tests for myocardial ischemia: Angels in the stress echo lab (2003)
- The appropriate and justified use of medical radiation (2014)
- Stress echo for ischemia detection (2006)
- Ultrasonic Tissue characterization of myocardial ischemia and the atherosclerotic plaque (2013)
- Stress echo complications and catastrophes: heart of darkness (2005)

### **Stress echo book and video-companion dream team 2015**

Contributors  
Geographic map  
Charts and contributions

### **General information for users**

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