

eccode

Echocardiography Contrast Coalition
to Optimize Diagnostic Efficiency



C M E Consultants, Inc.

a nationally accredited continuing medical education company

present

Echocardiography Cases in Contrast

Consequences of Suboptimal Visualization

This live teleconference/webcast is developed for echocardiologists and clinical cardiologists, electrophysiologists, echocardiography and cardiology fellows, sonographers, sonography nurses, and other medical professionals who treat patients with cardiovascular disease

Participant Syllabus

Wednesday, July 20, 2005

3:00 – 4:00 PM Eastern

Monday, August 15, 2005

12:00 – 1:00 PM and 3:00 – 4:00 PM Eastern

To Participate

Please Dial 1-800-729-6268 Use Conference ID 1217

Or Visit

www.eccode.org

This activity is supported through an educational grant from:



GE Healthcare

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Key Facts

WHAT: This live CME/CE accredited teleconference/webcast offers a case-based approach to the stratification of patients undergoing echocardiography. Emerging evidence supports the use of contrast media in echocardiography, which reduces the occurrence of key findings going undetected, diagnostic inaccuracy, and ultimately poor outcomes for the patient. Participants in this program will learn which types of patients are the best candidates for the use of contrast-enhanced echocardiography and will be provided with practical tools for integrating its use into practice. This program features slide presentations followed by an interactive session allowing you to ask questions and receive immediate feedback. These discussions will be archived on the Internet following the live broadcasts.

WHO: This activity will be of interest to medical professionals, especially:

- Echocardiologists
- Clinical cardiologists
- Electrophysiologists
- Echocardiology and cardiology fellows
- Sonographers
- Sonography nurses

WHERE: This activity will be presented on the Internet and on the telephone:
Live Toll Free: 1-800-729-6268
Conference ID: 1217

If you wish to participate in the activity through the Internet, please log on to
www.eccode.org

WHEN: The activity will be held live:

Wednesday, July 20, 2005	3:00 – 4:00 PM Eastern
Monday, August 15, 2005	12:00 – 1:00 PM Eastern
	3:00 – 4:00 PM Eastern

Learning Objectives

At the end of this activity, the participant should be able to:

- Gain an understanding of contrast echocardiography, and its impact on cardiology practice with regard to diagnostic efficacy and efficiency
- Identify specific patient groups that are primary candidates for the use of contrast agents in echocardiography
- Develop an effective assessment and administration protocol in the use of contrast echocardiography, incorporating the entire echocardiography team
- Identify and differentiate the available echocardiography contrast agents

Agenda (Subject to Change)

- I. Welcome and Introduction
- II. Slide Presentation ~ Echocardiography Cases in Contrast: Consequences in Suboptimal Visualization, Neil Weissman, MD
- III. Live Question and Answer with Faculty, Neil Weissman, MD and William Zoghbi, MD.

Program moderated by Randolph P. Martin, MD.

Faculty

Moderator



*Randolph P. Martin, MD
Professor of Medicine
Emory University School of Medicine
Atlanta, GA*

Randolph P. Martin, MD is a Professor of Medicine (Cardiology) at Emory University School of Medicine in Atlanta. He is currently director of the Noninvasive Cardiology Laboratory at Emory University Hospital, where he developed the Echocardiography Laboratory. He is a fellow of the American College of Cardiology and served as 2003-2004 President of the American Society of Echocardiography. He also serves on the editorial boards of five different cardiology journals, including the American Journal of Medicine, American Journal of Cardiology, Echocardiography, Journal of the American College of Cardiology, and Journal of the American College of Cardiology. He has authored more than 100 articles and abstracts as well as 33 book chapters, primarily in the areas of echocardiography and other forms of cardiovascular ultrasound. He has also participated in two CD/DVD teaching aids on the subject of echocardiographic imaging.

Presenters



*Dr. Neil Weissman, MD
Director of Cardiac Ultrasound and Ultrasound Core
Laboratories
Cardiovascular Research Institute
Washington Hospital Center
Associate Professor of Medicine
Georgetown University School of Medicine
Washington, DC*

Neil Weissman, MD is an Associate Professor of Medicine at Georgetown University in Washington, DC, and Director of the Cardiac Ultrasound and Ultrasound Core Laboratories at the Cardiovascular Research Institute of the Washington Hospital Center. A fellow of the American College of Cardiology and the American Heart Association Council of Clinical Cardiology, Dr. Weissman is also a cofounder of the Capital Area Echo Society and a member of the American College of Physician, the American Society of Echocardiography, Public Responsibility in Medicine and Research (PRIM&R), and the Applied Research Ethics National Association, among others. He is

the senior editor of Cardiovascular Radiation Medicine, is on the Editorial Boards of five other medical journals, and is a reviewer for 21 publications, including the American Journal of Cardiology, American Journal of Cardiovascular Drugs, International Journal of Cardiology, and the Journal of the American Society of Echocardiography. Dr. Weissman's current research interests include the prevention and treatment of atherosclerosis in Native American diabetics and the detection of coronary artery disease with myocardial contrast echocardiography. He has given more than 130 lectures in the United States and abroad.



*Dr. William Zoghbi, MD
Acting Chief of Cardiology
John S. Dunn Sr. Professor of Medicine
Medical Director, Baylor Heart Clinic
Director, Echocardiography Research
Baylor College of Medicine
Houston, TX*

William Zoghbi, MD is the Acting Chief of Cardiology, the John S. Dunn Sr. Professor of Medicine, and Director of Echocardiography Research at the Baylor College of Medicine in Houston. A board-certified cardiologist, Dr. Zoghbi is also Medical Director of the Baylor Heart Clinic. He is a fellow of the American College of Cardiology, the Council of Clinical Cardiology, the American Heart Association, and the American Society of Echocardiography; he is also a member of Alpha Omega Alpha, the Texas Medical Association, and the Harris County Medical Society, among others. He has worked on the editorial boards of the Journal of the American College of Cardiology, Cardiology Clinics: Echocardiography in Valvular Disease, Circulation, and ACCF CardioSource, and is a reviewer for 12 journals, including Journal of the American Medical Association, New England Journal of Medicine, American Heart Journal, and the Journal of the American Society of Echocardiography. He has lectured in the United States and abroad, and his publications include more than 300 articles and abstracts.

Disclosure Statement

Potomac Center for Medical Education (PCME) adheres to guidelines of the Accreditation Council for Continuing Medical Education (ACCME) and all other professional organizations, as applicable, stating those activities where continuing education credits are awarded must be balanced, independent, objective, and scientifically rigorous.

All faculty in a position to control the content of a continuing medical education program sponsored by the Potomac Center for Medical Education are required to disclose any relevant financial relationships with any commercial interest. All conflicts are identified and resolved by PCME in advance of delivery of the activity to learners.

The content of some CME activities may contain discussions of non-approved or off-label uses of some of the agents mentioned. Please consult the prescribing information for full disclosure of approved users.

In direct response to the September, 2004, Accreditation Council for Continuing Medical Education (ACCME) Standards for Commercial Support, CME Consultants, Inc. issued a conflict of interest policy dated January 2, 2005. The policy states that the disclosure of potential financial conflicts of interest within the last 12 months must be made and resolved prior to date of the CME/CE activity where commercial support grants are to be used to fund the activity. The following conflicts have been managed and resolved through CME Consultants, Inc.'s Independent Review Committee. Our intent is to assist learners in assessing the potential for bias in information that is presented during this CME/CE activity.

The faculty is also aware it is their responsibility to inform the audience if discussion of any non-FDA approved uses of pharmaceuticals, medical equipment, prostheses, etc. will be included in their presentation.

Disclosures

Randolph P. Martin, MD Dr. Martin will discuss Non-FDA approved uses of Coronary perfusion (contrast) in the presentation.

Neil Weissman, MD Dr. Wiessman has received Grant/Research Support from Acusphere, Bracco, Point, and BMSL; is a Consultant and Investigator for Acusphere; and an Investigator for Bracco, Point, and BMSL.

William Zoghbi, MD

Dr. Zoghbi has received an honorarium from GE, and will discuss Non-FDA approved uses of perflutren protein-type A microspheres for injection in the presentation.

Accreditation

PHYSICIANS:

The Potomac Center for Medical Education is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The Potomac Center for Medical Education designates this continuing medical education activity for a maximum of 1.0 hour(s) in Category 1 credit towards the American Medical Association's Physician's Recognition Award. Each physician should claim only those hours of credit that he/she has actually spent in the educational activity.

NURSES:



CME Consultants, Inc. is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center (ANCC) Commission on Accreditation. This activity has been planned and implemented in accordance with the ANCC Commission on Accreditation Educational Design through the joint sponsorship of CME Consultants, Inc. and PCME.

CME Consultants, Inc. designates this program for 1.2 contact hours. Participants should claim only those contact hours actually spent in the educational activity. Any questions regarding the accreditation of this CE activity should be directed to CME Consultants, Inc. (info@cmeconsultantsinc.com).

SONOGRAPHERS:

Application has been made to the Society of Diagnostic Medical Sonography to offer continuing education credit for this activity.

How to Ask Questions During the Program

Questions by E-Mail

If you are participating online, you may submit your questions via e-mail. Type your question in the question box that appears on the website and send it at any time during the broadcast.

Questions by Phone

If you are participating by telephone, you may press * 1 on your telephone keypad at any time during the live event. The operator will connect you with a live question screener. The screener will take your question and contact information. You will be placed back in the main presentation after your question has been submitted.

Slide 1

Echocardiography Cases in Contrast

Consequences of Suboptimal Visualization

Slide 2

Echocardiography Cases in Contrast

*Consequences of Suboptimal
Visualization*

Dr. Neil Weissman, MD

Director, of Cardiac Ultrasound and Ultrasound Core Laboratories
Cardiovascular Research Institute Washington Hospital Center
Associate Professor of Medicine
Georgetown University School of Medicine
Washington, DC

Slide 3

Disclosures

Neil Weissman, MD

Grant/Research Support: Acusphere, Bracco, Point, BMSL.
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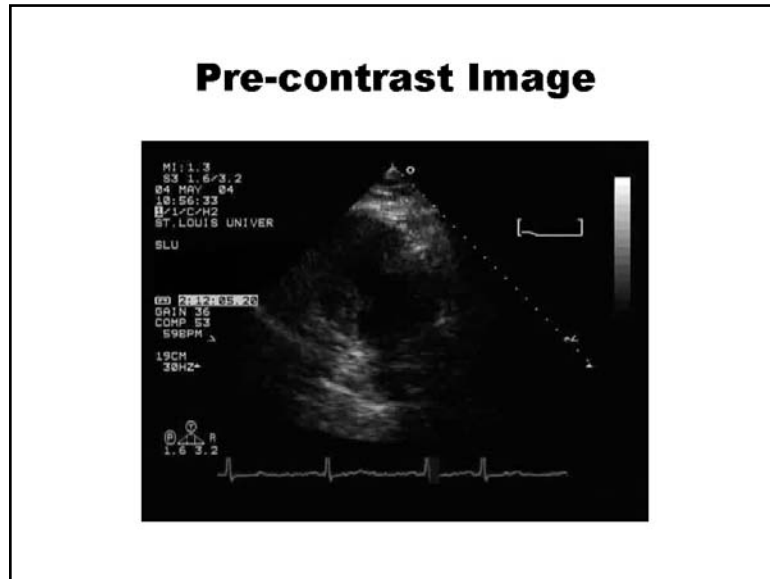
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Slide 4

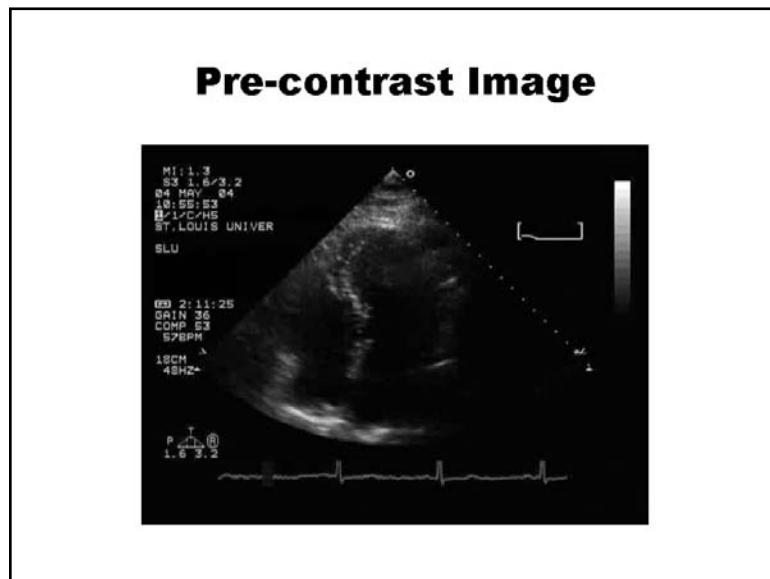
Case Presentation

- 54-year-old obese male presents to stress lab with chest pain
 - Patient is unable to adequately exercise so dobutamine stress echo is ordered
-
-
-

Slide 5



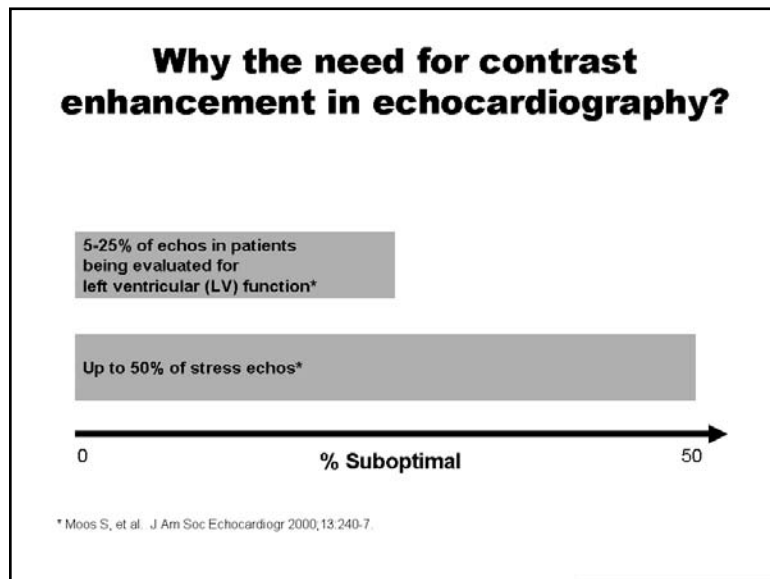
Slide 6



Slide 7

Is contrast echocardiography indicated here?

Slide 8



Slide 9

Echocardiography Contrast Agents	
Optison™ (Perflutren Protein — Type A Microspheres for Injection, USP)	Cross-linked serum human albumin/perfluoropropane
Definity® Vial for (Perflutren lipid microsphere) Injectable Suspension	Liposome/perfluoropropane

Slide 10

Evidence-Based Results From Clinical Trials *
93% improved endocardial border delineation (EBD) in the left ventricle^{1,2,3}
With one contrast agent, 87% of patients showed left ventricular opacification (LVO)^{1,2}
Clinically useful information was observed in 89% of patients⁴
Significant majority of exams were considered diagnostic^{1,2,3}
58-91% of non evaluable segmental wall images were converted to an evaluable image (depending on the reader)
<small>* 2 or more segments on apical 4-chamber were poorly visualized 1. OPTISON Prescribing Information. 2. Cohen JL, et al. J Am Coll Cardiol. 1998;32:746-752. 3. Definity Prescribing Information. 4. Kitzman DW, et al. Am J Cardiol. 2000;86:669-674.</small>

Slide 11

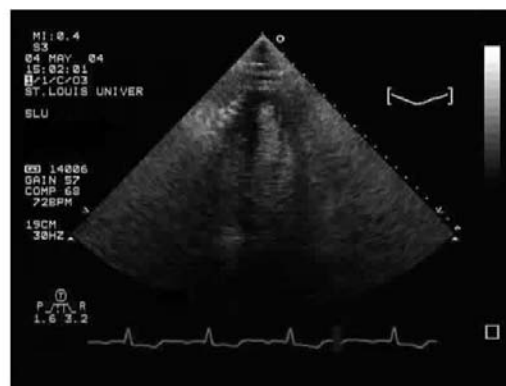
Contrast-Enhanced Stress Echo

- Stress echocardiography has shown high sensitivity and specificity in the detailed evaluation of^{1,2}:
- Regional wall motion
- Cavity size
- Left ventricular function at rest and peak stress
- Use of contrast agents achieve complete LVO and up to 95% improvement in EBD^{1,2}

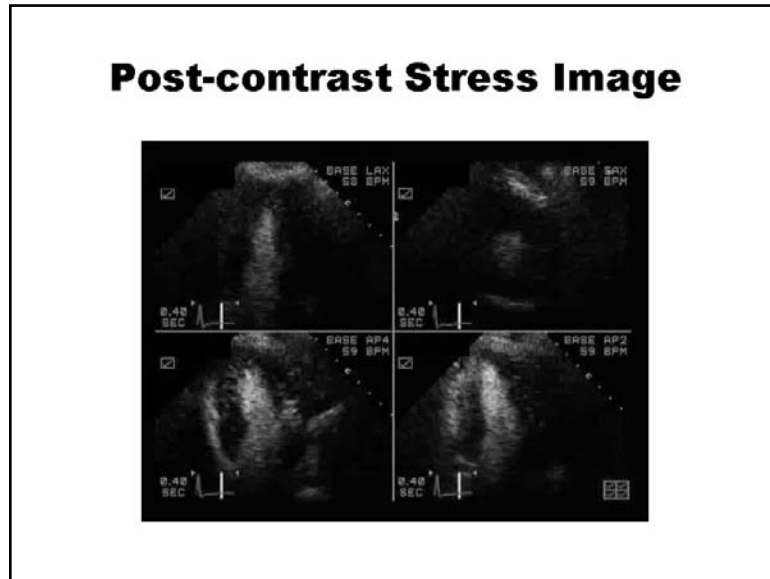
1. Mulvagh SL, et al. J Am Soc Echocardiogr. 2000;13:331-342.
2. Nathan S, et al. Ultrasound Contrast Agents. 2nd ed. Martin Dunitz Ltd; 2001:155-163.

Slide 12

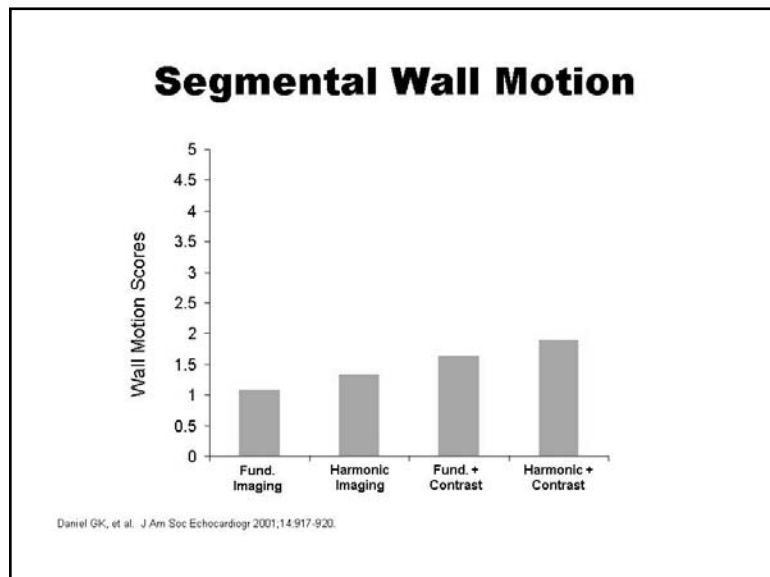
Post-contrast Pre-stress Image



Slide 13



Slide 14



Slide 15

Other Opportunities To Use Contrast Echocardiography...

...up-front when risk factors are noted

Slide 16

Identifying Patients Who might Benefit Most From Contrast

Obesity^{1,2,3}

Critical care unit (ICU/CCU/ED)^{1,7,8}

Left ventricular dysfunction^{3,4,5}

Chest surgery, large breasts, or breast implants^{1,6,7}

Pulmonary dysfunction^{3,4,5}

Congestive and dilated cardiomyopathy with LVEF between 20% and 40%⁴

1. Bieng MS, et al. J Diag Med Sonogr. 2002;18:121-130. 2. Finkelhor RS, et al. Am J Cardiol. 2000;85:740-743.
3. Hausnerova E, et al. J Am Soc Echocardiogr. 1999;12:967-968. 4. Cohen JL, et al. J Am Coll Cardiol. 1998;32:746-752.
5. OPTISON Prescribing Information. 6. Nahar T, et al. Am J Cardiol. 2000;86:1358-1362.
7. Reilly JP, et al. J Am Coll Cardiol. 2000;35:495-499. 8. Yong Y, et al. Am J Cardiol. 2002;89:711-718.

Slide 17

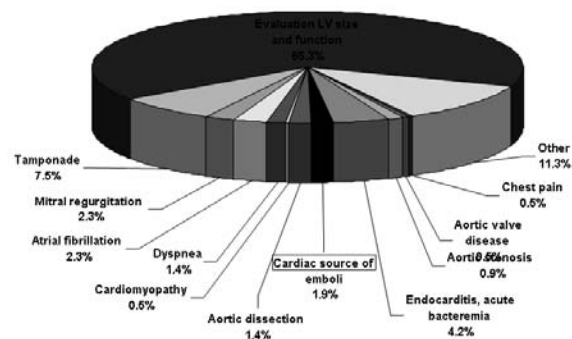
Contrast Echocardiography in the ICU

Prior studies have shown contrast echocardiography (CE) in the ICU clarifies endocardial border definition, LV wall motion, and LV ejection fraction when performed by experienced sonographers (ESO).

Reilly JP, et al. J Am Coll Cardiol 2000;35:485-90.
Kobluth M, et al. Am Heart J 2000;140:291-6.
Cosyns B, et al. Eur J Echocardiogr 2004;5:118-22.

Slide 18

Indications for Transthoracic Echocardiography in the ICU Setting



Makaryus AN, et al. Am Soc Echocardiogr 2005 May;18(5):475-80.

Slide 19

Contrast Echo Compared to Transesophageal Echocardiography (TEE) in the ICU

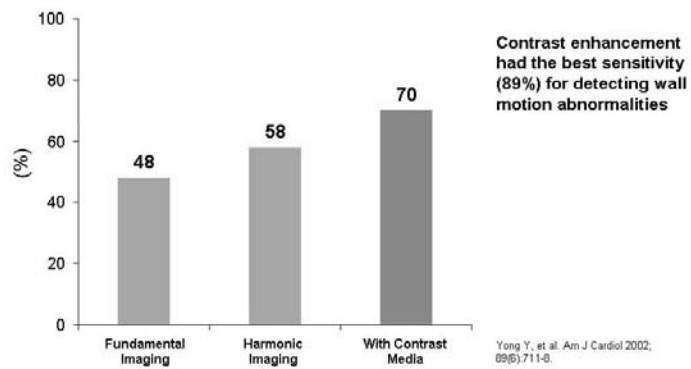
- 32 consecutive, technically difficult ICU patients*
- Comparison of harmonic imaging alone or in combination with CE to TEE
- Excellent or adequate endocardial visualization in 13% of segments with fundamental imaging and in 34% with harmonic imaging.
- Contrast echocardiography achieved excellent or adequate visualization in **87% of segments** ($p < 0.0001$) with no significant difference from the TEE success rate (90%)

* 50% or more than 16 segments not visualized from any view
Yong Y, et al. Am J Cardiol 2002; 89(6):711-8.

Slide 20

Contrast Echo Compared to Transesophageal Echocardiography (TEE) in the ICU: Wall Motion

With transesophageal echocardiography used as the standard, agreement in interpretation of wall motion was:



Slide 21

**Contrast Echo Compared to Transesophageal
Echocardiography (TEE) in the ICU:
Ejection Fraction**

Estimation of ejection fraction was possible:

- In 31% of fundamental imaging studies
- In 50% of harmonic imaging studies
- In 97% of contrast studies

Ejection fraction quantitated by contrast enhancement
correlated best with that achieved with TEE (r = 0.91)

Yong Y, et al. Am J Cardiol 2002; 89(6):711-8.

Slide 22

**Use of Contrast Echo in Obese
Patients Undergoing Stress Echo Prior
to Gastric Bypass Surgery**

*Morbid obesity (BMI ≥ 35 kg/m²) is a major
perioperative risk factor for cardiovascular morbidity
and mortality*

- Associated with a high incidence of poor
acoustic window
- Limits or contraindicates other evaluations including
cardiac catheterization and treadmill testing
- Stress echocardiography with dobutamine
and contrast enhanced echocardiography
is a valuable tool

Slide 23

Obese Patients Undergoing Stress Echo Prior to Gastric Bypass Surgery*: Baseline Characteristics	
Mean weight	345 lb (\pm 97)
Mean BMI	53 (\pm 11)
Women	78%
Mean age	44 yrs (\pm 10)
Diabetes mellitus	48%
Hyperlipidemia	58%
Hypertension	52%
Obstructive sleep apnea	37%
Pulmonary hypertension	12%
Mean LVEF	60% (\pm 2.4)

*N = 196
Cotiga, D, et al. Feasibility and perioperative prognosis of stress echocardiography in morbidly obese patients undergoing bariatric surgery. American College of Cardiology Annual Scientific Session, 2005.

Slide 24

- | Obese Patients Undergoing Stress Echo Prior to Gastric Bypass Surgery: Results | |
|---|--|
| <ul style="list-style-type: none">• All patients (N = 196) underwent dobutamine stress echocardiography (SE) or exercise SE using a 16-segment model for wall motion analysis• 130 (66%) resulted in poor acoustic window with < 13/16 segments visualized<ul style="list-style-type: none">– 100 of these subsequently underwent contrast SE using a second-generation agent | |
- Cotiga, D, et al. Feasibility and perioperative prognosis of stress echocardiography in morbidly obese patients undergoing bariatric surgery. American College of Cardiology Annual Scientific Session, 2005.

Slide 25

Obese Patients Undergoing Stress Echo Prior to Gastric Bypass Surgery: Results

- Contrast SE resulted in an 83% conversion of poor to good acoustic window with > 13/16 segments visualized
- SE was normal in 94.4% of patients and no cardiac events were observed in the postoperative follow up
- Negative predictive value of SE was 100%

Cotiga D, et al. Feasibility and perioperative prognosis of stress echocardiography in morbidly obese patients undergoing bariatric surgery. American College of Cardiology Annual Scientific Session, 2005.

Slide 26

Contrast Echo in Routine Transthoracic Studies for LV Global and Regional Wall Motion Visualization

- High-volume laboratory (650-750 echoes/month)
- 3-month feasibility phase plus subsequent established contrast media use
- Sonographer-driven decision to use contrast echo
- Modifications to improve access to contrast in ICU and on the cardiology floor
- Nurse and sonographer training in contrast use

Costello R, et al. Am Heart J 2003;145:535-41.

Slide 27

Contrast Echo in Routine Transthoracic Studies for LV Global and Regional Wall Motion Visualization

672 patients underwent CE echo, representing 7-8% of the total echo studies

- 371 men / 301 women
- Average age 64 (\pm 15)
- 15% undergoing stress testing
- 85% undergoing regular transthoracic echo studies

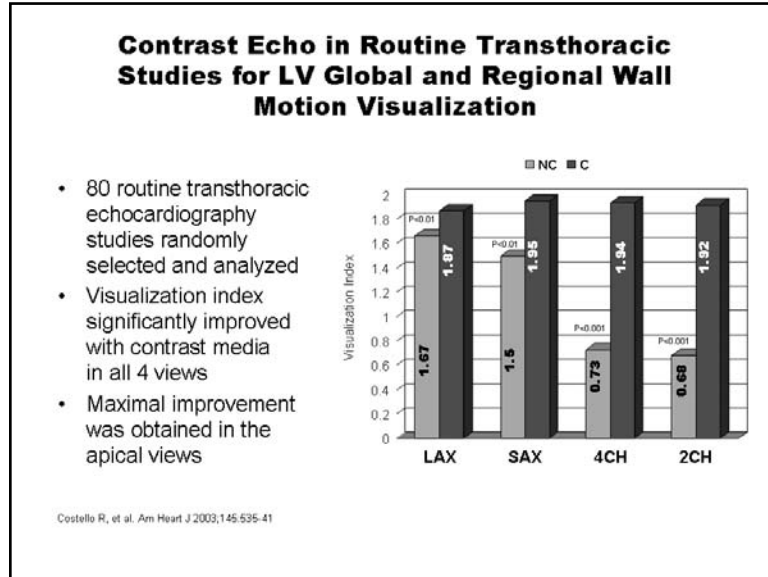
Slide 28

Contrast Echo in Routine Transthoracic Studies for LV Global and Regional Wall Motion Visualization

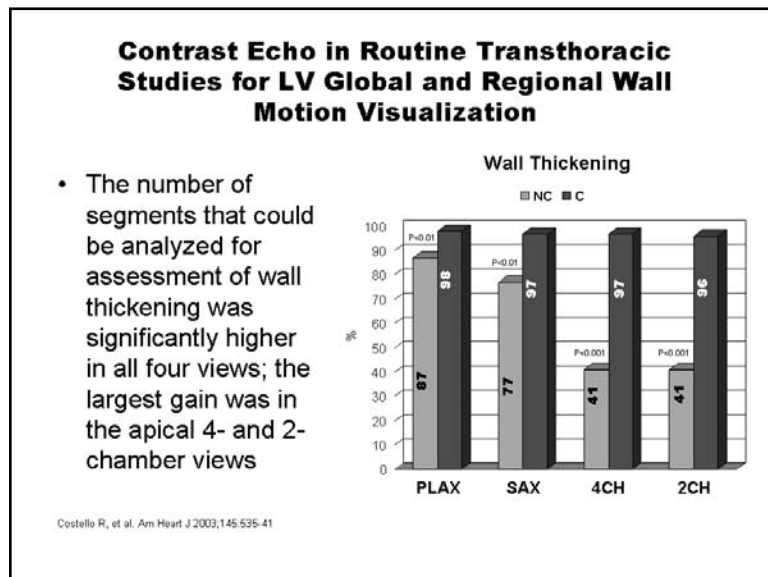
- 58% obese (BMI > 30)
- 19% normal weight
- 19% overweight (BMI 25-29.9)
- 11% chronic obstructive pulmonary disease
- 5% mechanical ventilation

Costello R, et al. Am Heart J 2003;145:535-41

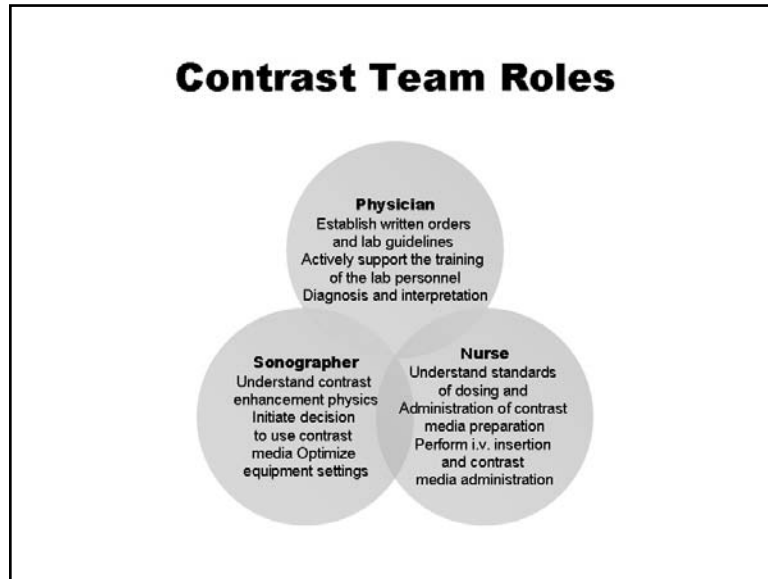
Slide 29



Slide 30



Slide 31



Slide 32

Assessment Protocol

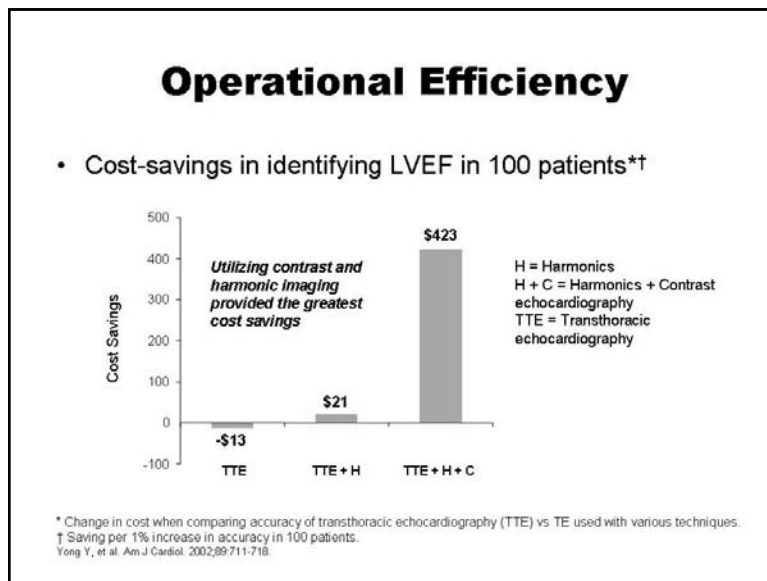
Quick Assessment Protocol

Using a quick assessment protocol could allow you to:

- Quickly determine whether the patients examination is suboptimal
- Conceivably save as many as 28 minutes (estimated) per echocardiographic procedure
- Potentially accrue time savings and increased revenue for the department

Quick Assessment	Exam	Contrast Exam
Sonographer performs Quick Assessment Protocol and notifies appropriate personnel if contrast media is needed	Sonographer performs routine echocardiographic examination including LV function and Doppler	If suboptimal images are yielded, follow standing order. Administer contrast agent to obtain optimal diagnostic contrast images
Time: 2 min (estimate)	Time: 30 min (estimate)	Time: 15-20 min (estimate)

Saint Louis University Medical Center Sonography Lab, St. Louis Medical Center protocol: Endocardial Border Definition Quick Assessment for the Use of Contrast. St. Louis, Mo.



2005 Coding for Echo Procedures Including Contrast

- Pursuant to Medicare Modernization Act (MMA) of 2003, echo contrast media is reimbursed separately from the procedure.
- 2005 guidelines now include reimbursement for the use of echocardiography contrast in **physicians' offices and free-standing clinics**
 - In these situations echocardiography contrast media is reimbursed at 106%
- I.V. line set up and insertion (supplies/staff time) are not included in the reimbursement for contrast and need to be billed separately

Slide 35

Summary and Conclusions

- 5-25% of echos are suboptimal and can be salvaged with contrast
 - Certain patient populations will have the greatest benefit from contrast such as obese, ICU, and those undergoing stress echos
 - Evidence-based studies have proven the clinical utility of contrast in these patient settings and in a busy laboratory
 - Contrast has been found to be cost-effective in this setting and is reimbursable in physician offices and free-standing clinics.
-
-
-

Slide 36

Questions and Answers
