Introduction to Transesophageal Echocardiography (iTEE)
The Basic TEE Exam for Non-cardiac Surgery

LEARNING OBJECTIVES

Saturday, February 6, 2010

7:30-7:45  *What You Know Now* – GS Hartman, MD
This session will serve as an introduction and overview of the course. Several example questions of what one would be expected to know upon completion of the course will be presented.

7:45 – 8:15  *How are TEE Images Created?* - JS Shanewise, MD
2-D image Generation
Doppler Imaging Modalities

*Objectives*: Upon conclusion of this lecture the attendee should be able to:
1. Create an ultrasound image
2. Define the basic physics concepts used in medical ultrasound imaging
3. Discuss the utility and applications of Doppler color flows imaging.

8:15-8:45  *Making a Perfect Picture* - SK Shernan, MD
Knobology
Image Optimization

*Objectives*: Upon conclusion of this lecture the attendee should be able to:
1. Identify basic TEE knobology platforms
2. Distinguish common TEE imaging controls used to obtain and optimize two-dimensional images.
3. Recognize common TEE imaging controls used to obtain and optimize Doppler images.

8:45 – 9:15  *Images That Aren’t Real* – SK Shernan, MD
Artifacts

*Objectives*: Upon conclusion of this lecture the attendee should be able to:
1. List the principles of ultrasound responsible for the generation of artifacts
2. Explain the causes of the common echocardiographic artifacts
3. Distinguish artifact images from true pathology

9:45-10:30  *You’re in the Driver’s Seat* - SK Shernan, MD; GS Hartman, MD
Knobology and Image Optimization Workshop
Live-demonstration session

*Objectives*: Upon conclusion of this lecture the attendee should be able to:
1. Recognize the common knobs on a TEE machine
2. List the functions of the standard knobs on a TEE machine
3. Optimize an ultrasound image using knobology
2010 iTEE Learning Objectives

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10:30-11:00  Let's Have a Look at Your Heart – D Shook, MD
Cardiac Anatomy: Surface and Internal Anatomy
Lecture plus Anatomical Sections (Pro-section), Surface Anatomy and TEE Views:
LV & RV, Aortic Valve and Ascending Aorta

**Objectives:** Upon conclusion of this lecture the attendee should be able to:
Have an understanding of surface anatomy of the heart.
1. Label the cardiac structures seen on the surface of the heart
2. Recognize the internal anatomical structures of the heart
3. Correlate 2-D TEE view to their anatomical correlates.

11:00-11:30  TEE Probe Manipulation - GS Hartman, MD
Probe manipulations and scan planes

**Objectives:** Upon conclusion of this lecture the attendee should be able to:
1. List the possible movements of the TEE probe used in imaging
2. Rotate the beam angle on a TEE probe
3. Use TEE probe manipulations to find the standard 20 TEE views

11:30- 12:00  What You Should Examine - JS Shanewise, MD
Basic Examination and Standard Views

**Objectives:** Upon conclusion of this lecture the attendee should be able to:
1. Describe the Basic TEE Exam planes
2. Determine the rationale for viewing selected TEE planes
3. Recite a reliable sequence for the Basic TEE Exam.
4. Discuss the indications and contraindications of a Basic TEE Exam.

1:00 – 3:00  The Roster
Identification of Cardiac Structures
Left Ventricle - RM Savage, MD
Mitral Valve - SK Shernan, MD
Aortic Valve - GS Hartman, MD
Thoracic Aorta/Pericardium - JS Shanewise, MD
RV/TV/PV - D Shook, MD
LA/RA/PulV/LAA/Liver - KE Glas, MD

**Objectives:** Upon conclusion of this series of lectures the attendee should be able to:
1. Recognize normal anatomy and function of the intracardiac chambers and appendages in a case-based format
2. Recognize normal anatomy and function of the intracardiac valves a case-based format
3. Recognize normal anatomy and function of the thoracic aorta in a case-base format
4. Recognize normal anatomy and function of the pulmonary veins, pericardium and liver in a case-base format

3:30-4:00  What in the World are These? - SK Shernan, MD; GS Hartman, MD
Anatomical Unknowns and Examples

**Objectives:** Upon conclusion of this lecture the attendee should be able to:
1. Recognize examples of anatomical structures and their TEE images in unknown case examples.

4:00-4:30  **Going with the Flow** - GS Hartman, MD  
Color Flow Doppler Assessment of AV and MV

**Objective:** Upon conclusion of this lecture the attendee should be able to:  
1. Recite the physical principles of Doppler color flow imaging  
2. Apply Doppler color flow to assess the normal aortic and mitral valve.

4:30-5:00  **Summing it All Up** - KE Glas, MD  
A complete focused TEE examination for Non-cardiac Surgery  
Report/Archiving

**Objective:** Upon conclusion of this lecture the attendee should be able to:  
1. Recite the components of the complete Basic TEE Exam  
2. List the necessary reporting and archival responsibilities.

**Sunday, February 7, 2010**

8:00-8:30  **Cardiac Anatomy** - D Shook, MD  
Heart Prosection (demonstration)  
Mitral Valve, Tricuspid & Pulmonic Valves, Right and Left Atrial Structures

**Objectives:** Upon conclusion of this lecture the attendee should be able to:  
1. Recognize and correlate the surface cardiac structures to corresponding 2D TEE views.  
2. Recognize and correlate internal cardiac chambers to corresponding 2D TEE views  
3. Recognize and correlate cardiac valves to corresponding 2D TEE views

8:30-9:00  **The Pressure is On** - GS Hartman, MD  
Quantitative Echo I

**Objective:** Upon conclusion of this lecture the attendee should be able to:  
1. Recite the basic principles for the quantitative use of TEE ultrasound.

9:00-9:30  **Basic Hemodynamics** - RM Savage, MD  
Quantitative Echo II  
Basic Hemodynamic Calculations & Examples

**Objective:** Upon conclusion of this lecture the attendee should be able to:  
1. Describe the formulas used for hemodynamic calculations  
2. Explain the how to acquire the data used in hemodynamic formulas  
3. Apply Doppler derived echocardiography data to perform hemodynamic calculations.

10:00-12:00  **The Broken Heart**  
Cardiac Pathology Workshop  
LV + RV Global Function - RM Savage, MD
Pericardial + Pleural Effusions - KE Glas, MD
Aortic Stenosis – GS Hartman, MD
Aortic Insufficiency - JS Shanewise, MD
Mitral Stenosis - D Shook, MD
Mitral Regurgitation - SK Shernan, MD

Objectives: Upon conclusion of this series of lectures the attendee should be able to:
1. Recognize abnormal anatomy and function of the intracardiac chambers and appendages in a case-based format
2. Recognize abnormal anatomy and function of the intracardiac valves a case-based format
3. Recognize abnormal anatomy and function of the thoracic aorta in a case-base format
4. Recognize abnormal anatomy and function of the pulmonary veins, pericardium and liver in a case-base format

12:15-12:45  Show me the Money – JS Shanewise, MD
A Focused TEE Service
Setup/reimbursements/staffing/billing

Objective: Upon conclusion of this lecture the attendee should be able to:
Describe how to set-up, service, staff, bill and be reimbursed for a TEE service.

1:00 – 1:30  It's All in the Motion - SK Shernan, MD
LV and RV RWMA

Objective: Upon conclusion of this lecture the attendee should be able to:
1. Recognize the echocardiographic appearance of left and right ventricular dysfunction.
2. Qualitatively and quantitatively assess ventricular dysfunction

1:30-2:00  Rescue TEE - KE Glas
PA vs TEE and Non-cardiac Case Studies

Objective: Upon conclusion of this lecture the attendee should be able to:
1. State the utility and limitations of a pulmonary artery catheter vs. the Basic TEE Exam.
2. Recognize the use of TEE for diagnosis in non-cardiac surgery case examples

2:00-2:30  Why is My Patient Blue? – D Shook, MD
ASDs, PFOs, Shunts

Objectives: Upon conclusion of this lecture the attendee should be able to:
1. Use of the Basic TEE Exam to diagnose the potential causes of cyanosis.
2. Recognize and quantify intracardiac shunts (ASDs, VSDs).

2:30-3:00  Seeing is Believing - GS Hartman, MD
Ultrasound for Vascular Access

Objectives: Upon conclusion of this lecture the attendee should be able to:
1. Apply 2D imaging for central venous cannulation.
2. Recite the role of 2D ultrasound has played in the prevention of complications during central venous cannulation
3. Improve in cannulation success rates during central venous access.

3:30-4:00  What Do All Those Letters Mean? - SK Shernan, MD
TEE Certification
Basic TEE Exam vs. PTeEXAM

**Objectives:** Upon conclusion of this lecture the attendee should be able to:
1. Categorize the various certification processes
2. Discuss the differences between the Basic TEE Exam and the PTeEXAM

4:00-5:00  My Patient is Sick, What can I Do? – KE Glas, RM Savage, JS Shanewise, SK Shernan
Case Examples

**Objectives:** Upon conclusion of this lecture the attendee should be able to:
1. Describe how the Basic TEE Exam can be used to manage the patient with hemodynamic instability of unknown origin.
2. Use the information learned in this workshop to discuss the pretest answers and complete a posttest evaluation of knowledge about how to apply the Basic TEE exam to clinical care.

5:00-5:15  Post Test and Wrap-up – GS Hartman, SK Shernan
This session will consist of a summary and wrap-up of the two day course. A brief examination and discussion of the answers will follow to illustrate participants’ achievements.