Echo Week - Learning Objectives

Sunday, May 21

6 - 7 pm  
**Echo Week Pre-Test**  
Moderator: Feroze Mahmood, MD FASE

Monday, May 22

7:30 – 9:30 am  
**Image Creation and Hemodynamics**  
Moderator: Douglas C. Shook, MD FASE  
At the conclusion of this activity, participants will be better able to:
1. Understand the ultrasound physics and apply it to image creation and optimization
2. Apply Doppler principles to hemodynamic assessment and volume estimation
3. Utilize cardiac ultrasound as the means for non-invasive catheterization

9:50 – 11:50 am  
**The Views and Function**  
Moderator: Fabio Papa, MD FASE  
At the conclusion of this activity, participants will be better able to:
1. Recognize the relevant anatomical relationships involved in TEE and the importance of probe manipulation on scan planes
2. Identify normal and abnormal left and right ventricular function
3. To recognize the importance of diastolic function assessment in the perioperative setting and perform both qualitative and quantitative Doppler analysis of diastolic function

1 - 3 pm  
**Aortic and Mitral Valve Structure and Function**  
Moderator: Douglas C. Shook, MD FASE  
At the conclusion of this activity, participants will be better able to:
1. Understand the basic echocardiographic valve examination.
2. Recognize Doppler patterns of stenotic and regurgitant aortic and mitral valves.
3:20 – 5:15 pm  **Potpourri**
Moderator: Jonathan D. Leff, MD

At the conclusion of this activity, participants will be better able to:

1. Choose the TEE images for imaging of right-sided vessels
2. Assess the anatomy and evaluate the tricuspid and pulmonic valves
3. Compare the TEE and epiaortic views required for a thorough assessment of the thoracic aorta
4. Explain the 2D and Doppler characteristics for assessment of the different pericardial diseases

7 - 8:30 pm  **Comprehensive Physics Review**
Moderator: Nikolaos J. Skubas, MD DSc FACC FASE

At the conclusion of this activity, participants will be better able to:

1. Recall the generation of imaging ultrasound
2. Explain the interaction of ultrasound with tissue
3. Differentiate the imaging requirements between 2D and Doppler echocardiography
4. Compare artifacts to anatomic pitfalls

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**Tuesday, May 23**

7:30 – 11 am  **Case-Based Small Groups with Interactive Discussions**
Moderator: Nikolaos J. Skubas, MD DSc FACC FASE

At the conclusion of this activity, participants will be better able to:

1. Discriminate the severity grades of mitral regurgitation
2. Appraise the echocardiographic indicators of mitral stenosis
3. Compare the techniques for evaluation of the severity of aortic stenosis
4. Explain the pitfalls when grading aortic regurgitation severity
5. Differentiate between techniques to evaluate global and regional systolic function
6. Assess the right ventricular function
7. Interpret the different stages of diastolic dysfunction

11 am – Noon  **Congenital Heart Disease**
Moderator: Feroze Mahmood, MD FASE

At the conclusion of this activity, participants will be better able to:

1. Echocardiographically recognize and distinguish the most common cardiac congenital abnormalities
2. Illustrate the differences between various inter-atrial septal defects
3. Identify the commonest cardiac congenital abnormalities that can remain undiagnosed and discovered incidentally
4. Identify and categorize the cardiac congenital abnormalities that can impact the course of cardiopulmonary bypass
**3:45 – 5:15 pm**  
**Tissue Doppler and Cardiac Kinetics**  
Moderator: Annette Vegas, MDCM FASE FRCPC  
At the conclusion of this activity, participants will be better able to:  
1. Describe the limitations of current imaging modalities to determine myocardial structure and function  
2. Illustrate the incremental value of tissue Doppler in assessment of myocardial function  
3. Define the rationale for strain assessment  
4. Describe the methods for assessing strain during a complete echocardiographic assessment  
5. Summarize the value of tissue Doppler and strain imaging in routine clinical practice

**7 – 9 pm**  
**Who Wants to Be an Echo Millionaire?**  
Moderator: Madhav Swaminathan, MD FASE  
At the conclusion of this activity, participants will be better able to:  
1. Describe the value of TEE for the intraoperative assessment of patients undergoing cardiac surgery  
2. Elucidate the role of echocardiography in intraoperative hemodynamic evaluation  
3. Delineate the limitations of TEE in echocardiographic assessment of cardiac pathology

**Wednesday, May 24**  
**6:45 – 7:45 am**  
**Problem-Based Learning Discussions (PBLDs)**  
Moderator: Feroze Mahmood, MD FASE; Mark A. Taylor, MD  
At the conclusion of this activity, participants will be able to:  
**Moderate Aortic Stenosis** -  
1. Describe how to define and grade moderate aortic stenosis utilizing 2D ultrasound and Doppler echocardiography.  
2. Describe the echocardiographic and surgical risk factors, which impact treatment decision-making perioperatively in patients with moderate aortic stenosis.  
3. Define low gradient aortic stenosis and discuss the differences between severe aortic stenosis pseudostenosis.  
4. Discuss the utilization of dobutamine to help evaluate severity of aortic stenosis in low flow/low gradient stenosis.  
5. Discuss the management of patients with moderate aortic stenosis in association with other cardiac surgical procedures utilizing current management guidelines.  
**Moderate Mitral Regurgitation**  
1. Describe how to define and grade moderate mitral regurgitation utilizing 2D and 3D ultrasound and Doppler echocardiography.
2. Describe how intraoperative evaluation of mitral regurgitation is affected by anesthesia and surgical factors.
3. Describe the echocardiographic and surgical risk factors, which impact treatment decision-making perioperatively in patients with moderate mitral regurgitation.
4. Discuss the management of patients with moderate mitral regurgitation in association with other cardiac surgical procedures utilizing current management guidelines.

Moderate Tricuspid Regurgitation
1. Describe how to define and grade moderate tricuspid regurgitation utilizing 2D and 3D ultrasound and Doppler echocardiography.
2. Describe how intraoperative evaluation of tricuspid regurgitation is affected by anesthesia and surgical factors.
3. Describe the echocardiographic and surgical risk factors, which impact treatment decision-making perioperatively in patients with moderate tricuspid regurgitation.
4. Discuss the management of patients with moderate tricuspid regurgitation in association with other cardiac surgical procedures utilizing current management guidelines.

8 - 11 am
You Are the Surgeon: Hands-On Porcine Heart Dissection
Moderator: Madhav Swaminathan, MD FASE
At the conclusion of this activity, participants will be better able to:
1. Identify cardiac and great vessel anatomy in the porcine heart.
2. Correlate porcine anatomical structures to 2D echocardiographic structures.
3. Correlate porcine anatomical structures to surgical anatomic landmarks.

12:30 – 1:30 pm
Fundamentals of 3D Echocardiography
Moderator: Bruce A. Bollen, MD
At the conclusion of this activity, participants will be better able to:
1. Compare 3D and 2D modalities with respect to fundamental differences in image characteristics.
2. Describe the technique for 3D assessment of valve structure and function.
3. Recognize the value of 3D imaging for evaluation of cardiac function.

3 – 3:50 pm
Clinical Application of 3D Echocardiography
Moderator: Bruce A. Bollen, MD
At the conclusion of this activity, participants will be better able to:
1. Define the approach to the appropriate use of intraoperative 3D echocardiography.
2. Elucidate the value of 3D echocardiography in surgical decision-making.
3. Describe the 3D imaging platforms available to assess cardiac/valvular structure and function.
4:30 – 7:30 pm  
**3D Imaging and Laptop Workshop**  
Moderator: Douglas C. Shook, MD FASE and Madhav Swaminathan, MD FASE

At the conclusion of this session, participants will be better able to:

1. Optimize 3D datasets for clinical decision-making.
2. Understand the utility of multi-planar analysis of 3D volume data sets.
3. Appreciate the limitations of 3D imaging for qualitative and quantitative analysis.

Thursday, May 25

7:30 – 9:30 am  
**Decision Making in Mitral Valve Disease**  
Moderator: Bruce A. Bollen, MD

At the conclusion of this activity, participants will be better able to:

1. Attendee will understand the mechanisms of mitral regurgitation, classification systems and utilization of 2D and 3D echocardiography to define and quantify mitral regurgitation.
2. Attendee will understand the rationale for utilizing a mitral annuloplasty technique during mitral valve repair and the basis for utilizing rings/bands and rationale for these being flexible vs semi-flexible vs rigid.
3. Attendee will learn, for repair of myxomatous (primary) mitral valve disease, the anatomic/echocardiographic risk factors for failure pre-repair and how post repair echocardiography guides the surgeon to accept/re-repair/replace the mitral valve.
4. Attendee will learn, for ischemic (secondary) mitral regurgitation, the controversies relating to echocardiographic/clinical assessment of anatomic mechanisms, role of surgical intervention, and if chosen type of surgical intervention.

10 am – Noon  
**Decision Making in Aortic Valve Disease**  
Moderator: Kent H. Rehfeldt, MD FASE

At the conclusion of this activity, participants will be better able to:

1. Characterize aortic stenosis severity in patients with low flow or low gradients across the aortic valve.
2. Make recommendations regarding the need for concomitant aortic valve intervention when cardiac surgery is being performed for other indications.
4. Review strategies for interrogating a newly implanted aortic valve prosthesis when a high prosthetic pressure gradient is measured.

12:15 – 1 pm  
**10th Annual Arthur E. Weyman, MD, Lecture**  
Moderator: Douglas C. Shook, MD FASE; Nikolaos J. Skubas, MD DSc FACC FASE; Madhav Swaminathan, MD FASE

At the conclusion of this activity, participants will be better able to:

1. Describe recent advances in cardiovascular echo imaging
2. Review the role of echo imaging in the surgical, interventional or critical care environments
3. Delineate contemporary challenges for perioperative echocardiographers

1 – 3 pm  **Interventions for Structural Heart Disease**
Moderator: Feroze Mahmood, MD FASE

At the conclusion of this activity, participants will be better able to:

1. List the various structural heart disease interventions that require echocardiographic guidance
2. Demonstrate the role of transesophageal echocardiography for specific structural heart disease interventions
3. Show the various two and three-dimensional echocardiographic views for specific structural heart disease interventions
4. Outline the conduct of the entire procedure with specific role of echocardiography
5. Summarize the role of three-dimensional imaging during various structural heart disease interventions.

3:30 – 5 pm  **The Heart Team: Case Discussions**
Moderator: Christopher A. Troianos, MD FASE

At the conclusion of this session, participants will be better able to:

1. Describe and apply a team based approach to complex valvular heart disease.
2. Understand the interdisciplinary approach to the complex cardiac patient.
3. Incorporate imaging into the interdisciplinary decision-making process.

6:30 – 9:30 pm  **3D Imaging and Laptop Computer Workshop**
Moderator: Douglas C. Shook, MD FASE and Madhav Swaminathan, MD FASE

At the conclusion of this session, participants will be better able to:

1. Optimize 3D datasets for clinical decision-making.
2. Understand the utility of multi-planar analysis of 3D volume data sets.
3. Appreciate the limitations of 3D imaging for qualitative and quantitative analysis.

Friday, May 26

7:30 – 9:30 am  **Complex Imaging Dilemmas**
Moderator: Alina Nicoara, MD FASE

At the conclusion of this activity, participants will be better able to:

1. Describe an anatomic approach to imaging defects of the interatrial septum with application into guiding percutaneous closure
2. Describe echocardiographic features of repairable aortic valve pathology and post-procedure assessment of the repaired aortic valve
3. Identify clinical situations with application of transesophageal echocardiography in thoracic surgery
4. Delineate the added utility of three-dimensional assessment in evaluation of paravalvular leaks
5. Summarize echocardiographic assessment relevant for placement of ventricular assist devices

**9:45 am – 12:15 pm**  
**Test Yourself: A Comprehensive Review of Echo Week**  
Moderator: Douglas C. Shook, MD FASE

At the conclusion of this session, participants will be better able to:

1. Apply ultrasound physic principles to differentiate true images from artifacts in real-life scenarios.
2. Differentiate normal from pathologic valves in clinical cases.
3. Diagnose regional and global ventricular dysfunction in simulated clinical situations.
4. Review all aspects of perioperative echocardiography in a question or case-based format.