

Echocardiography Cardiac Doppler Course

2024

40 AMA PRA Category 1



Echocardiography Cardiac Doppler Ultrasound

Faculty: Shawn Shanmuganathan BS, RDMS, RVT

Welcome to Advanced Health Education Center

As the Senior Vice President, I would like to thank you for choosing Advanced Health Education Center's (AHEC) for your Ultrasound training course. The faculty, staff, and fellow students join me in welcoming you. We will make reasonable efforts to ensure that your time with us is enjoyable as well as educational. These courses are designed to help you develop the skills and acquire the information necessary to perform at a high level of competency in sonography. There are various areas in which you will be evaluated during the course to ensure your learning and success.

AHEC has been a leading provider of continuing education for healthcare professionals in imaging sciences since 1988. Our mission is to provide you with evidence-based education and training that will increase your knowledge, enhance your competency, and improve patient care. Since receiving ACCME Accreditation in 1998, we have assisted in the development of ultrasound skills for physicians, sonographers, nurses, midwives and other healthcare professionals.

The registration packet is designed to provide students with general information regarding AHEC, course information, CME credit, and disclosure of relevant financial interest. We wish you well in your professional advancements and are here to assist you in pursuing your educational goals. Please contact us if we can be of further assistance to you at 1-800-239-1361.

Congratulations and good luck pursuing your professional goals!

Best,



KReddix

Kelli Reddix, MBA, BAAS, LVN
Senior Vice President
Phone 1-800-239-1361 • 8502 Tybor, Houston, Tx, 77074



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Course Overview

Event Location: Advanced Health Education Center
8502 Tybor Drive
Houston, Texas, 77074

Credit: 40 AMA PRA Category 1™

Time: 8:00 am – 5:00 pm

Instructor: Shawn Shanmuganathan BS, RDMS, RVT

Course Description:

The Five-day echocardiography ultrasound program is a systematic presentation of echocardiography scanning using an integrated teaching approach of lecture, assigned reading, testing, demonstration, and clinical scanning of models. Didactic training is reinforced through clinical laboratory experience.

Echocardiography has come a long way from its humble beginnings. The addition of M-Mode, two-dimensional real-time imaging, Doppler, color flow, and now three- and four-dimensional imaging have all changed the way echocardiography is practiced. Diastolic assessment and changes in nomenclature have even changed the language of Echo. This course covers echo from M-mode to 3-D. After completion you will be confident in choosing the proper tools to assess common pathological conditions such as valvular abnormalities, systolic, and diastolic function. Development of a consistent protocol is mandatory to avoid missing pathology and our scan lab with state-of-the-art equipment and low student instructor ratios will give you the time and opportunity to practice, practice, practice.

Faculty: Shawn Shanmuganathan - No relevant financial relationships to disclose.

Course Objectives:

At the completion of this course, the learner will be able to:

- Explain normal cardiovascular anatomy and physiology and relate cardiovascular functions to disease.
- Discuss cardiac mechanical and electrical physiology and relate this information from the echocardiogram to the basic electrocardiogram.
- Operate several ultrasound units for the production of 2-D, M-Mode and Doppler echocardiograms.
- Perform an echocardiogram using the protocol defined by the American Society of Echocardiography, i.e. parasternal long and short, apical 2, 4, 5, and long, and subcostal long and short axis.



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- Quantitatively analyze the results of 2-D and M-Mode echocardiogram. Analyze the results of an echocardiogram for normal versus abnormal findings.
- Analyze the results of an echocardiogram for normal versus abnormal findings.
- Analyze echocardiograms for common cardiac pathologies.
- Identify and resolve basic technique and equipment problems that interfere with the quality of studies.
- Define the clinical responsibilities of an echocardiographer who is confronted with significant clinical findings.
- Conduct a basic patient history and assessment that relates to interpretation of echocardiographic findings.
- Operate several cardiac ultrasound instruments and apply various types of cardiac Doppler; pulse wave, continuous wave and color flow mapping. *Describe the normal cardiovascular blood flow through the heart and the great vessels as defined by Doppler velocity measurements and profiles.
- Quantify Doppler findings in echocardiography.
- Analyze common cardiac Doppler findings for common cardiac pathologies.
- Identify the diseases or cardiac pathologies that require definition by Doppler examination.

Course Topics:

- Ultrasound Physics and Instrumentation
- Cardiovascular Anatomy and Physiology and EKG
- Equipment Orientation
- Anatomy and Physiology and Cardiac Catheterization
- 2-D Imaging
- M-Mode
- Acquired Heart Disease
- Congenital Heart Disease
- Doppler Instrumentation and Controls
- Doppler Normals
- Cardiac Quantification
- Cardiac Doppler in Disease
- Special Procedures
- Contrast Echocardiography



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Course Schedule

Lecture 8am-12noon | Lunch 12-1pm | Scan Lab 1pm-5pm

Day 1 Lecture: Welcome and Introduction

- Ultrasound physics- Sound, Transducers, Image
- Knobology- Instrumentation
- Orientation of the heart- Imaging Planes- 2D- Echo

Scan Lab: Ultrasound Instrumentation

- Orientation – Imaging Planes
- Echo demonstration
- 2D- Echo - PSLA and PSSA views

Day 2 Lecture: Cardiac Anatomy

- Cardiac Physiology and the circulatory system
- Introduction to M-Mode
- M-Mode - AV/LA
- Contrast Echocardiography

Scan Lab: 2D- Echo PSLA

- 2D- Echo PSSA
- Apical View 2 & 4-Chamber
- M-Mode RV/LV

Day 3 Lecture: Review PSLA, PSSA, Anatomy (Interactive)

- M-Mode - RV/LV
- M-Mode- MV
- Aortic Valve
- Cardiac Doppler
- Protocol Calculation Methodology

Scan Lab: PSLA, PSSA, All M-Modes

- Orientation to Color Doppler,
- Pulsed Wave Doppler,
- Continuous Wave Doppler and
- Spectral Doppler



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Day 4 Lecture: Cardiac Diseases

- Peripheral vascular Diseases
- Mitral Valve Diseases
- Aortic Valve Diseases
- Continuity Equation
- Special Procedures in Cardiology

Scan Lab: Complete Echocardiogram

- With all views in M-Mode
- RV/LV, Mitral Valve, Aortic Root
- With all Doppler Evaluations
- Mitral Valve (LVIT), Aortic Valve (LVOT),
- Pulmonic Valve (RVOT), Tricuspid Valve

Day 5 Lecture: Pulmonic Valve

- Tricuspid Valve
- Diastology- Diastolic Evaluation
- Right Heart Quantification

Scan Lab: Complete Echocardiogram

- With all views in M-Mode
- RV/LV, Mitral Valve, Aortic Root
- With all Doppler Evaluations
- Mitral Valve (LVIT), Aortic Valve (LVOT),
- Pulmonic Valve (RVOT), Tricuspid Valve



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Skills Checklist:

The participant demonstrates an understanding of the following controls to optimize the image:

Master Gain	Filters	Sample Volume
Scale, PRF, Nyquist Limit	Baseline	Gate Size
Color Bar	Color Sector Steering	Measuring Peak Systolic Velocity
Invert Color	Color Maps	Measuring End Diastolic Velocity

The participant identifies images and measures where applicable the following views:

PSLA	PSSA
Apical 4	Apical 2/3
Subcostal	Supraclavicular

Measurements for Echo:

B-Mode	Simpson's Method of Disk/EF
RV/LV	RVSP/PAP
AV/LA	Cardiac Output
Continuity Equation	MV Qualitative Measurements
Pressure Half Time	M-Mode
Peak and Mean Velocities	Pulse Doppler
Vena Contracta	CW Doppler

CME Credit:

- “The Advanced Health Education Center is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.”
- “The Advanced Health Education Center designates this educational activity for a maximum of 40 hours AMA PRA Category I™. Physician should claim credit commensurate with the extent of their participation in the activity.”



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AHEC defines a skills course as a limited enrollment course where a received registration with payment reserves your place in a course (i.e. all Ultrasound courses, Mammography Initial Training and other theory courses). For cancellations received at least two weeks prior to the course date, a refund less a 30% processing fee will be given. Within two weeks of the course, no refund is given, but a tuition credit – less a 30% processing fee – may be applied to a future course. No refunds or tuition credit is given for non-attendance. Facilities may substitute employees by notification to AHEC at least one week in advance.

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- Ultrasound Faculty
- No relevant financial interest to disclose
- Virlene Guzman, RT(R), RDMS, RVT
 - Ultrasound Faculty
 - No relevant financial interest to disclose
- Shawn Shanmuganathan, BS, RDMS, RVT
 - Ultrasound Faculty
 - No relevant financial interest to disclose

Content Validation:

All presentations designated for AMA PRA Category 1™ are reviewed and approved by members of the curriculum committee for content validity, and to ensure that no conflicts of interest exist prior to the advertisement and delivery of the educational activity.

The faculty and staff at AHEC welcome you!