ADVANCED HEALTH EDUCATION CENTER®

EDUCATION ▲ STAFFING ▲ CONSULTING

Echocardiography Cardiac Doppler Course

40 AMA PRA Category 1

Faculty: Shawn Shanmuganathan BS, RDMS, RVT

Target Audience: Physicians who want to learn basic echocardiography procedure skills and entry level interpretation, and sonographers or other health professionals learning to perform adult echocardiography procedures.

Disclosure Summary: All relevant financial relationships of faculty and planners have been disclosed and mitigated. Full disclosure information is provided within this syllabus.

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

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Welcome to Advanced Health Education Center

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

On behalf of the faculty, staff, and your fellow students, I want to personally welcome you to your Ultrasound training course at AHEC. We're thrilled you've chosen us to advance your education, and we are committed to making your experience both enjoyable and rewarding. Our courses are designed to help you build practical skills, deepen your knowledge, and perform at a high level of competency in sonography. Throughout your training, you will be evaluated in several areas to ensure your growth and success.

Since 1988, AHEC has been a trusted provider of continuing education for healthcare professionals in the imaging sciences. Our mission is to provide evidence-based education that enhances your competency and improves patient care. We have proudly supported the development of ultrasound skills for physicians, sonographers, nurses, midwives, and other healthcare professionals.

This registration packet includes essential information about AHEC, your course, CME credit, and disclosure of any relevant financial interests. We are here to support you in achieving your educational goals—please don't hesitate to reach out to us at 1-800-239-1361 if you need assistance.

Congratulations on taking this step in your professional journey. We look forward to seeing your skills and confidence grow!

Warmest Regards,



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

Echocardiography Cardiac Doppler Ultrasound

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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:

Echocardiography Cardiac Doppler Ultrasound – Five-Day Program

This five-day Echocardiography Cardiac Doppler Ultrasound course provides a comprehensive, hands-on learning experience using an integrated approach of lecture, assigned reading, testing, demonstration, and clinical scanning of models. Didactic instruction is reinforced through extensive time in our state-of-the-art scan lab, ensuring ample opportunity for practice under expert guidance.

Echocardiography has evolved dramatically — from M-Mode and two-dimensional imaging to Doppler, color flow, and now three- and four-dimensional imaging. Advances in diastolic assessment and evolving nomenclature have transformed how echocardiography is performed and interpreted. This course covers echocardiography from M-Mode through 3-D imaging, giving participants the confidence to select the appropriate tools to assess common cardiac pathologies, including valvular disease and systolic and diastolic dysfunction.

A consistent scanning protocol is essential for accurate diagnosis, and our low student-to-instructor ratio ensures individualized attention as you practice and refine your skills. By the end of this program, you will be confident performing, analyzing, and interpreting echocardiographic studies according to current clinical standards.

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.

- 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

Echocardiography Cardiac Doppler Ultrasound

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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

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

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

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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."

AHEC Cancellation and Refund Policy for Skills Courses:

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.

Disclosure of Relevant Financial Interest for Individuals in Control of Content

As an ACCME-accredited provider, Advanced Health Education Center (AHEC) is committed to ensuring balance, independence, objectivity, and scientific rigor in all of its educational activities.

In accordance with ACCME Standard 3, AHEC requires that all individuals in control of content—including planners, faculty, committee members, and administrative personnel involved in the planning, development, or production of educational activities—disclose all financial relationships with ineligible companies within the past 24 months. A financial relationship is considered relevant if it exists between the individual and an ineligible company whose products or services are related to the content of the educational activity.

AHEC has implemented mechanisms to identify, mitigate, and disclose relevant financial relationships to prevent commercial bias in its educational activities. All disclosed relevant financial relationships have been mitigated prior to the commencement of the educational activity.

The individuals listed below are acknowledged by AHEC as having control of the content, planning, development, or administrative support of all educational activities.

- Marilyn Sackett, M. Ed, RT (R), Committee Member
    - AHEC: President
    - No relevant financial interest to disclose
- Jence Garza, MHA RT(R) - Committee Member
    - AHEC: Chief Executive Officer (CEO)
    - No relevant financial interest to disclose
- Peggy Hoosier, M.Ed RT(R)(M) - Committee Member
    - AHEC: Consultant
    - No relevant financial interest to disclose

- Kelli Reddix, MBA, BAAS, LVN - Program Director
  - AHEC: Senior Vice President
  - No relevant financial interest to disclose
- Nanette Joiner
  - AHEC: Administrative Support
  - No relevant financial interest to disclose
- Chevaun Fletcher, BS, RDMS
  - Ultrasound Faculty
  - No relevant financial interest to disclose
- Jessica Smith, BS, MHA, RDMS
  - 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™ credit undergo a rigorous review process to ensure content validity. This process includes:

- Curriculum Committee Review: All content is reviewed and approved by members of the curriculum committee for scientific accuracy, balance, and alignment with current evidence-based practices.
- Peer Review: Where applicable, content is subjected to peer review by individuals with appropriate clinical expertise and no relevant financial relationships with ineligible companies.
- Conflict of Interest Assessment: Prior to the advertisement and delivery of the educational activity, all individuals involved in the planning, development, or production of the activity disclose any relevant financial relationships. Any identified conflicts are resolved in accordance with ACCME Standard 3.5.
- Identification of Emerging Topics: New and evolving topics are clearly identified as such within the program to distinguish them from established, evidence-based practices.

This comprehensive approach ensures that all educational content is fair, balanced, and based on the best available evidence, thereby supporting safe and effective patient care.