ADVANCED HEALTH EDUCATION CENTER®

EDUCATION ▲ STAFFING ▲ CONSULTING

Carotid Duplex Ultrasound Course

16 AMA PRA Category 1

Faculty: Shawn Shanmuganathan BS, RDMS, RVT

Target Audience: This activity is designed for physicians, sonographers, nurses, and other healthcare professionals interested in ultrasound imaging.

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

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!

Warm Regards,



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: 16 AMA PRA Category 1™
Time: 8:00 am – 5:00 pm
Instructor: Shawn Shanmuganathan BS, RDMS, RVT

Course Description:

Carotid Duplex Ultrasound – 16 Hours (2 Days) | In-Person | Houston, TX
Vascular ultrasound has evolved far beyond its early two-dimensional, black-and-white images to become the gold standard for detecting peripheral arterial, cerebrovascular, and venous disease, including DVT and venous reflux. Accurate diagnostics require a solid understanding of vascular anatomy, hemodynamics, and the pathological conditions that can affect blood flow, with variables such as cardiac output, dehydration, and infection influencing results.

This 2-day course combines lecture and hands-on scanning in our state-of-the-art lab with live models. Participants will gain a comprehensive overview of physics, instrumentation, anatomy, hemodynamics, and diagnostic criteria. Low student-to-instructor ratios and extensive case studies provide ample opportunity to practice scanning protocols and develop the skills needed to perform diagnostic carotid duplex exams confidently. The course is designed for sonographers, other healthcare professionals, and physicians seeking foundational training or a deeper understanding of vascular lab capabilities and interpretive criteria.

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

Course Objectives:

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

- Correctly identify vessel anatomy and orientation in a vascular ultrasound examination.
- Identify the variations in instrumentation and Doppler principles and the effects in scanning parameters.
- Describe the flow characteristics and the manifestations of disease processes.
- Discuss QA of the procedure and equipment.
- Analyze the results of a vascular exam for pathological conditions and in certain cases, quantify the diseases.
- Identify additional resource information on vascular ultrasound.

Course Topics:

- Overview of the physical principles of ultrasound including Doppler and color flow
- Comprehensive review of the ultrasound platform controls enabling you to optimize your system for even the most difficult patient
- Carotid duplex testing including: anatomy, hemodynamics, diagnostic criteria, case studies, reporting
- Case studies, pearls and pitfalls, and standardized reporting
- Hands-on scan lab

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Course Schedule

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

Day 1 Lecture

- Physics and Instrumentation
- Normal Anatomy and Hemodynamics
- Scan Protocol
- Quality Assurance
- Carotid Arterial Disease
- Case Studies

Scan Lab

Day 2 Lecture - Carotid

- Basic Anatomy of the Carotid Arteries
- Carotid Anatomy, Physiology, and Hemodynamics
- Doppler: Color, Spectral, Morphology, Physiology, and Quantification

Scan Lab

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Skills Checklist

Two Dimensional / Gray Scale

The student should acquire the image and identify the following structures under real time sonography in all standard views:

- ☐ Lateral and Posterior Lateral
- ☐ Longitudinal and Transverse Views

Left and Right Arterial Images:

- ☐ Proximal Common Carotid Artery
- ☐ Mid Common Carotid Artery
- ☐ Distal Common Carotid Artery
- ☐ Bulb
- ☐ Bifurcation
- ☐ Proximal Internal Carotid Artery
- ☐ Mid Internal Carotid Artery
- ☐ Distal Internal Carotid Artery
- ☐ Proximal External Carotid Artery
- ☐ Mid External Carotid Artery
- ☐ Distal External Carotid Artery
- ☐ Vertebral Artery

Other Structures on Left and Right:

- ☐ Thyroid
- ☐ Jugular Vein
- ☐ Subclavian Artery
- ☐ Brachiocephalic Trunk
- ☐ External Branches

Color Doppler

The student should apply Color Doppler to evaluate the following structures:

- ☐ Left and Right Common Carotid Artery
- ☐ Left and Right Internal Carotid Artery
- ☐ Left and Right External Carotid Artery
- ☐ Left and Right Vertebral Artery
- ☐ The student should be able o optimize the Color Doppler parameters for low, medium, and high flow status of all arteries with the following options:
  - ☐ Scale
  - ☐ Pulse Repetition Frequency (PRF)
  - ☐ Nyquist Limit
  - ☐ Baseline
  - ☐ Electronic Steering
  - ☐ Color Doppler Gain
  - ☐ Filter
  - ☐ Angle Correct

Spectral Doppler Analysis

The student should acquire a stable window to apply angle-corrected pulsed wave interrogation through the following vessel segments:

- ☐ Left and Right
- ☐ Proximal, Mid and Distal Common Carotid Artery
- ☐ Proximal, Mid and Distal Internal Carotid Artery
- ☐ Proximal, Mid and Distal External Carotid Artery
- ☐ Vertebral Artery

Measurements Documented

- ☐ Peak Systolic Velocity (PSV)
- ☐ End Diastolic Velocity (EDV)
- ☐ ICA / CCA Ratio, Systole ≤ 1.8
- ☐ ICA / CCA Ratio, Diastole ≤ 2.6
- ☐ % Stenosis by area circumference

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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 16 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

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- 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.