

# Ultrasound Courses

## Course Description

Whether you're a beginner or a seasoned sonographer, this year's AAEM pre-conference ultrasound course will be worth your time. We will be offering an introductory course for beginners. This will include didactic sessions on physics, trauma exam (FAST), abdominal aorta and ultrasound assisted procedures (including central line placement). Half of your time will be spent in small groups scanning models with a very favorable instructor/student ratio.

Physicians who have already taken an introductory course will have an opportunity to build their own ultrasound course in our advanced modules. These will be structured to maximize "hands-on" scanning of models. Modules will be offered in aorta, cardiac, equipment, gallbladder & renal, gastrointestinal, head & neck, musculoskeletal, ocular, pelvic ultrasound, peripheral nerve blocks, physics, procedures, pulmonary, shock, testicular ultrasound, trauma and venous access & DVT.

The faculty will include physicians with international reputations as outstanding ultrasound educators.

## Advanced Ultrasound Half-Day Course Credit Designation Statement

The American Academy of Emergency Medicine (AAEM) designates this live activity for a maximum of 3.75 *AMA PRA Category 1 Credit(s)*<sup>™</sup>. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

## Advanced Ultrasound Full-Day Course Credit Designation Statement

The American Academy of Emergency Medicine (AAEM) designates this live activity for a maximum of 6.5 *AMA PRA Category 1 Credit(s)*<sup>™</sup>. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

## Introductory Ultrasound Course Credit Designation Statement

The American Academy of Emergency Medicine (AAEM) designates this live activity for a maximum of 6.75 *AMA PRA Category 1 Credit(s)*<sup>™</sup>. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

## Learning Objectives

Upon completion of this course participants will be able to:

### AORTA

1. Understand the surface landmarks for appropriate transducer positioning to perform sonographic examinations of the thoracic and abdominal aorta.
2. Demonstrate the ability to identify and visualize landmarks for the aorta in the transverse and longitudinal scanning planes.
3. Understand the sonographic findings and pitfalls for identifying pathology including aortic aneurysm.

### CARDIAC

1. Understand the utility of motion modality (M-mode) and demonstrate its use.

2. Demonstrate the surface landmarks and transducer position necessary to perform an echocardiogram in the ED.
3. Acquire and interpret sonographic images of heart (subcostal, parasternal long, parasternal short and apical windows).
4. Identify pathologic conditions such as pericardial effusion, gross wall motion abnormalities and cardiac tamponade.

#### EQUIPMENT

1. Learn to be an expert on your own equipment.
2. Learn how to safely connect and remove probes from their ports.
3. Learn how to switch between transducers.
4. Learn and demonstrate how to store and review images.
5. Demonstrate adjustments to controls. i.e., gain, depth, frequency in hands-on session.
6. Demonstrate how to properly document an ultrasound study by adding patient information, text annotation and proper landmarks.

#### GALLBLADDER & RENAL

1. Understand the surface landmarks for appropriate transducer positioning to perform sonographic examinations of the aorta, kidney and gallbladder.
2. Understand the sonographic windows and landmarks of the aorta, kidney and gallbladder.
3. Demonstrate the ability to identify and visualize landmarks for the aorta, kidney and gallbladder in the transverse and longitudinal scanning planes.
4. Understand the sonographic findings and pitfalls for identifying pathology including aortic aneurysm, hydronephrosis and cholelithiasis/cholecystitis.

#### GASTROINTESTINAL

1. Understand the sonographic appearance of normal stomach, large and small bowel, and pancreas, including normal anatomical structures and normal bowel peristalsis.
2. Describe transducer choices, scanning protocols and patient positions necessary to perform a gastrointestinal examination.
3. Identify and detect gastrointestinal pathology such as ileus, pneumoperitoneum, appendicitis, colitis, diverticulitis, ileitis, intussusception or hernias.
4. Describe common sites of intra-and retroperitoneal free air, systematic examination techniques and pitfalls for appendicitis, pneumoperitoneum, colitis, diverticulitis and hernia.

#### HEAD & NECK

1. Understand the normal sonographic appearance and anatomical landmarks of organs and structures in the head and neck region, including ocular, salivary glands, thyroid gland, the upper airway including larynx and trachea, upper esophagus, facial bones and neck vessels and lymph node anatomy.
2. Describe transducer choices, scanning protocols and patient positions necessary to perform a focused ocular examination to detect retinal detachment, vitreous hemorrhage, lens dislocation, periocular free air or increased intracranial pressure.
3. Understand common thyroid abnormalities such as cysts or masses and the anatomical relation of the parathyroid glands.
4. Describe the appearance of salivary glands and appearance of salivary stones. Identify lymph nodes within the neck.

5. Describe ultrasound exam techniques to detect upper airway anatomy to guide correct endotracheal tube placement including normal esophagus and appearance of esophageal intubation.
6. Understand anatomy of main neck vessels and their relation to other musculoskeletal structures.

#### MUSCULOSKELETAL

1. Discuss the advantages and disadvantages of diagnostic musculoskeletal ultrasound compared to other imaging modalities.
2. Demonstrate the appearances of various tissues on diagnostic musculoskeletal ultrasound.
3. Correctly apply ultrasound basic concepts so as to ensure proper visualization of musculoskeletal structures.
4. Proficiently perform a diagnostic musculoskeletal ultrasound on various upper and lower limb structures.

#### OCULAR

1. To review and understand how sonography can reveal pathology of the eye and to highlight its usefulness as a simple and cost-effective tool in investigating eye symptoms.
2. Understand the normal ultrasound anatomy of the eye, specifically the location of the retina.
3. Know which probe is needed for ultrasound scans of the eye and the method to accurately and safely perform the exam.
4. Visualize an example of a retinal detachment diagnosed by ultrasound.

#### PELVIC ULTRASOUND

1. Understand the indications for emergency screening ultrasound examinations of the pelvis.
2. Describe the surface landmarks and transducer position necessary to perform transabdominal and endovaginal ultrasound examinations of the pelvis.
3. Perform an endovaginal US on model patients demonstrating correct scanning technique.
4. Interpret common diagnoses in first trimester pregnancy.

#### PERIPHERAL NERVE BLOCKS

1. Discuss the science and practical performance of brachial plexus, axillary and femoral blockade.
2. Learn the physiology and anatomy of the techniques and factors that influence success and complications.
3. Demonstrate approaches for peripheral nerve blocks in the upper and lower extremity.
4. Demonstrate peripheral nerve block on simulator under ultrasound guidance.

#### PHYSICS

1. Enhance the understanding of the basic principles of ultrasound.
2. Apply these principles to the reduction of common artifacts and improvement of high quality diagnostic ultrasound images.
3. Understand the relationship between transducer position and image orientation.
4. Demonstrate the basic operator controls on the ultrasound system required for image acquisition.

#### PROCEDURES

1. Understand the sonographic landmarks and anatomical relationships as they relate to commonly performed procedures in the ED.

2. Acquire and interpret sonographic images of the internal jugular, lung and chest wall, right upper abdominal quadrant and heart.
3. Demonstrate ultrasound guided central venous access, thoracentesis, paracentesis and pericardiocentesis on patient simulation models.

#### PULMONARY

1. Review and understand the sonographic artifacts of normal and pathologic pulmonary conditions that give pulmonary ultrasound its diagnostic capacity. This includes, but is not limited to, pleural imaging, the "lung sliding sign," B-line and comet tail identification for extravascular pulmonary congestion and pleural effusion imaging techniques.
2. Demonstrate sonographic landmarks of the ribs, pleura, diaphragm and lung parenchyma.
3. Distinguish between normal and pathologic condition through image review and hands-on imaging practice.

#### SHOCK

1. Provide a sequenced approach to ultrasound in the medical shock patient.
2. Demonstrate the surface landmarks and transducer position necessary to evaluate the heart, IVC, aorta and peritoneum.
3. Review causes and potential responses to treatments of hypotension and tissue malperfusion.

#### TESTICULAR ULTRASOUND

1. Learn and demonstrate the landmarks for the testes in the longitudinal and transverse plane.
2. State the importance of using color Doppler and pulsed wave Doppler to indicate the waveform of vessels in the testes and epididymis.
3. Review the following disorders of the testis: hydrocele, varicocele, orchitis, epididymitis and varicocele.

#### TRAUMA

1. Understand the surface landmarks for appropriate transducer positioning to perform the FAST examination.
2. Understand the sonographic landmarks and anatomical relationships of the heart, liver, spleen and bladder as they relate to the FAST examination.
3. Demonstrate the ability to identify and visualize the areas of potential intra-abdominal and thoracic spaces for free fluid to collect in on the FAST examination.
4. Understand the sonographic findings and pitfalls for identifying life-threatening trauma conditions such as cardiac tamponade, hemo/pneumothorax and intra-abdominal hemorrhage.

#### VENOUS ACCESS & DVT

1. Understand the sonographic landmarks and anatomical relationships as they relate to the vasculature of the neck, upper extremity and groin.
2. Acquire and interpret sonographic images of the internal jugular, femoral, basilic, brachial and axillary veins in live patient models.
3. Demonstrate ultrasound guided cannulation on vascular simulator.
4. Learn the diagnostic criteria for deep venous thrombosis (DVT).
5. Demonstrate compression technique for DVT assessment.

## **Tentative Course Schedule**

### **Introductory Ultrasound**

Saturday, February 9, 2013

8:00am-8:15am	Welcome
8:15am-9:00am	Introduction & Physics
9:00am-9:45am	The Fast Examination
9:45am-10:00am	Fast- Case Studies
10:00am-10:15am	Break
10:15am-11:00am	Aorta
11:00am-12:00pm	Procedures
12:00pm-1:00pm	Lunch
1:00pm-2:30pm	Modules
2:30pm-2:45pm	Break
2:45pm-4:15pm	Modules
4:15pm	Adjourn

### **Advanced Ultrasound**

Saturday, February 9, 2013

#### **Full Day**

8:00am – 4:00pm (lunch on your own)

Pick 6 application modules

#### **Half Day session**

8:00am – 12:00pm

1:00pm – 5:00pm

Pick 3 application modules

#### **Modules:**

Aorta	Peripheral Nerve Blocks
Cardiac	Physics
Equipment	Procedures
Gallbladder and Renal	Pulmonary
Gastrointestinal	Shock
Head & Neck	Testicular Ultrasound
Musculoskeletal	Trauma
Ocular	Venous Access & DVT
Pelvic Ultrasound	

#### **Course Director**

**Michael J. Lambert, MD RDMS FAAEM**

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