

# Introduction to Emergency Ultrasound

Enhance your knowledge and skills in the following areas:

- Physical principles of clinical ultrasound
- Basic ultrasound use of controls and sonographic equipment
- Echocardiography
- Trauma ultrasound
- Ultrasound-guided vascular access
- Abdominal ultrasound
- Emergency obstetric ultrasound
- Politics, credentialing, and program implementation for the emergency physician

## Course Objectives:

This workshop offers two full days of intensive ultrasound education and hands-on use of ultrasound as a diagnostic tool in the emergency department. As the conclusion of this course, participants should be able to have a thorough understanding of how, when, and why to use ultrasound, as well as having insights into how to gain organizational support for its use in the emergency department.

## Course Schedule:

### Day 1

8:00-8:45	Introduction and Course Objectives
	The lecturer will go over the specific objectives of the course: ultrasound physics, instrumentation, primary emergency ultrasound indications, how to document and suggested quality monitoring. Ultrasound's role and what differentiates emergent ultrasonography from formal consultative studies including the relative advantages and pitfalls.
8:45-10:00	Physics and Instrumentation
	Basic physics needed to operate the machine, understand image generation and optimization, recognize and understand ultrasound artifacts.
10:00-11:00	Ultrasound Instrument Orientation ( <i>Hands-on</i> )
	Initial orientation to ultrasound instrumentation. One instructor and instrument per 5 students. Emphasis on gain, output, TGC, and hard copy generation.
11:00-12:00	Rapid Trauma Ultrasound Exam
	Learn the FAST exam for trauma. Review normal and abnormal scans in thoraco-abdominal trauma. Review the literature including the recommended algorithms (Key Clinical Pathway) for emergency department application. Review the limitations of this exam.

12:00-12:45	Lunch
12:45-1:30	<p>Cardiovascular Applications</p> <p>Primary emphasis on cardiac and pericardial imaging to include primary and secondary windows, recognition of pericardial effusion and tamponade, and indications and limitations for cardiac arrest and PEA. Vascular sonography will cover the technique for obtaining ultrasound-guided central venous access.</p>
1:30-1:45	Break
1:45-5:00	<p>Trauma / Cardiovascular Ultrasound <i>(Hands-on)</i></p> <p>In depth, repetitive review of the trauma, cardiac, and abdominal aorta exam. Then individual skills evaluation for transducer position, target organ identification, and hard copy image capture for each of the following: RUQ, cardiac, LUQ, Pouch of Douglas, one secondary cardiac view (other than subxiphoid), and long and short axis views of the abdominal aorta.</p>
<u>Day 2</u>	
8:00-8:45	<p>RUQ Ultrasound</p> <p>Review the technique, images, and test characteristics of the ultrasound cholelithiasis and acute cholecystitis. Indications and limitations of the emergency ultrasound for abdominal pathology will be discussed.</p>
8:45-9:15	<p>Aorta/Renal Ultrasound</p> <p>Discuss the technique for sonography of the aorta and kidneys. Specific pathologic conditions discussed will include abdominal aortic aneurysm and hydronephrosis.</p>
9:15-11:00	<p>Abdominal Ultrasound <i>(Hands-on)</i></p> <p>In depth, repetitive review of the emergency abdominal ultrasound exam. Individual skill evaluation for transducer position, target organ identification, and hard copy image capture for each of the following: gallbladder, gallbladder ducts, liver, Morison's pouch, kidneys, and the urine collecting system.</p>
11:00-12:00	<p>Emergency Pelvic Ultrasound</p> <p>Compare test characteristics of transabdominal and transvaginal ultrasound in patients with pregnancy related problems. Describe the technique used when performing transvaginal ultrasound. Review a clinical pathway using emergency ultrasound in patients with suspected ectopic pregnancy.</p>
12:00-12:45	Lunch

12:45-1:00 Pelvic Ultrasound Laboratory Orientation

1:00-4:00 Emergency Pelvic Ultrasound  
*(Hands-on)*

Using real models, the participants will learn to perform transabdominal and transvaginal ultrasound of the uterus and recognize normal findings on pelvic ultrasound.

4:00-5:00 Documentation and Quality Assurance

Establish an approach to documentation of emergency ultrasound exams in the medical record and in a quality monitoring database. Review an approach to quality monitoring designed to decrease variability in study quality and improve overall performance. Discuss techniques and qualities needed to develop a successful emergency ultrasound program.