

To further standardize ultrasound learning objectives within emergency medicine residency programs, ACEP released their policy statement [Ultrasound Guidelines: Emergency, Point-of-care, and Clinical Ultrasound Guidelines in Medicine](#).¹ Within the policy statement, ACEP laid out their recommended curriculum for comprehensive training in emergency ultrasound (EUS). The award-winning, patented SonoSim Ultrasound Training Solution matches these industry recommendations through an ecosystem of cloud-based courses, knowledge assessments, interactive SonoSimulator® scanning cases, performance tracking, and access to real-patient pathology.

Physics & Instrumentation	
ACEP Emergency Ultrasound Learning Objective	Fundamentals of Ultrasound Course & Lessons
Explain ultrasound physics relevant to EUS:	
Piezoelectric effect, frequency, resolution, attenuation, and echogenicity	Introduction, Basic Ultrasound Physics, Imaging Artifacts
Doppler including pulse wave, color, and power	Imaging Modes, Doppler Mode Imaging
Operate the EUS system as needed to obtain and interpret images adequate for clinical decision making:	
Image mode	Imaging Modes
Gain, time gain compensation, and focus	Ultrasound System Operation
Probe types	Transducer Basics
Recognize common ultrasound artifacts:	
Reverberation, side lobe, mirror, shadowing, enhancement, and ring-down	Imaging Artifacts

*ACEP Emergency Ultrasound Learning Objective Category not covered: Introduction

Trauma		
ACEP Emergency Ultrasound Learning Objective	Trauma Courses & Lessons	SonoSimulator Cases to Scan
Describe the indications, clinical algorithm, and limitations of EUS in:		
Blunt and penetrating thoracoabdominal trauma	eFAST & FAST: Introduction	--
Perform the EUS protocol for:		
Trauma	eFAST & FAST: All Lessons	eFAST & FAST Cases
Identify relevant US anatomy including:		
Pleura and diaphragm	eFAST: The eFAST Exam	eFAST Cases
Inferior vena cava	RUSH: The Tank - Intravascular Volume	RUSH Cases
Pericardium, liver, spleen, kidneys, and bladder	eFAST & FAST: RUQ Views, Cardiac Views, LUQ Views, Pelvic Views	eFAST & FAST Cases
Prostate and uterus	eFAST & FAST: Pelvic Views Prostate: Anatomy, Sonographic Anatomy Female Pelvis: Anatomy	eFAST & FAST Cases Prostate Cases Female Pelvis Cases
Recognize pathologic findings and pitfalls in the evaluation of:		
Pneumothorax and hemothorax	eFAST: The eFAST Exam, Imaging Artifacts and Pitfalls, Case Studies	eFAST & RUSH Cases SonoSim LiveScan® Critical Care & Trauma Care Cases

Hemopericardium and cardiac activity	<i>eFAST & FAST: Cardiac Views, Performing the FAST Exam, Case Studies</i>	<i>eFAST Cases SonoSim LiveScan® Trauma Care Cases</i>
Volume status	<i>RUSH: The Pump - Global LV Function, The Tank - Intravascular Volume, Case Studies</i>	<i>RUSH Cases SonoSim LiveScan® Critical Care Cases</i>
Hemoperitoneum	<i>eFAST & FAST: RUQ Views, LUQ Views, Pelvic Views, Performing the FAST Exam, Case Studies, Imaging Artifacts and Pitfalls</i>	<i>eFAST & FAST Cases SonoSim LiveScan® Trauma Care Cases</i>
Integrate trauma EUS findings into:		
Individual patient, departmental, and disaster management	<i>eFAST & FAST: Case Studies FAST: Role of FAST</i>	<i>eFAST, FAST, & RUSH Cases SonoSim LiveScan® Critical Care & Trauma Care Cases</i>

First-Trimester Pregnancy		
ACEP Emergency Ultrasound Learning Objective	First-Trimester Pregnancy Course & Lessons	SonoSimulator Cases to Scan
Describe the indications, clinical algorithm, and limitations of EUS in:		
First-trimester pregnancy pain and bleeding	Introduction, First-Trimester Pregnancy Ultrasound	--
Understand the utility of:		
Quantitative B-HCG in the evaluation of first-trimester pregnancy pain and bleeding	<i>OB/GYN: Pathologic Conditions First-Trimester Pregnancy: Detecting Pregnancy Failure</i>	--
Perform EUS protocols for:		
Transabdominal and transvaginal views as needed, including fetal heart rate and gestational age measurement techniques	Sonographic Imaging Techniques, First-Trimester Pregnancy Ultrasound, Pregnancy Dating Using Ultrasound	<i>First-Trimester Pregnancy Cases</i>
Identify relevant US anatomy including:		
Cervix, uterus, adnexa, bladder, and cul-de-sac	Anatomy	<i>First-Trimester Pregnancy Cases</i>
Recognize the relevant findings and pitfalls when evaluating for intrauterine and ectopic pregnancy:		
Early embryonic structures including the gestational sac, yolk sac, fetal pole, and heart	First-Trimester Pregnancy Ultrasound	<i>First-Trimester Pregnancy Cases SonoSim LiveScan® Early Stage Pregnancy Cases</i>
Location of embryonic structures in pelvis	First-Trimester Pregnancy Ultrasound	<i>First-Trimester Pregnancy Cases SonoSim LiveScan® Early Stage Pregnancy Cases</i>
Embryonic demise	Detecting Pregnancy Failure	--
Molar pregnancy	Pathologic Conditions	--
Findings of ectopic pregnancy including pseudogestational sac, free fluid, and adnexal masses	Pathologic Conditions	<i>OB/GYN Cases SonoSim LiveScan® Early Stage Pregnancy Cases</i>
Integrate first trimester pregnancy EUS findings into:		
Individual patient and departmental management	--	<i>First-Trimester Pregnancy Cases SonoSim LiveScan® Early Stage Pregnancy Cases</i>

Abdominal Aorta		
ACEP Emergency Ultrasound Learning Objective	Aorta/IVC Core Clinical Course & Lessons	SonoSimulator Cases to Scan
Describe indications, clinical algorithm, and limitations of EUS in:		
Evaluation of aortic pathology	Introduction, Clinical Considerations	--
Perform EUS protocols to evaluate:		
Abdominal aorta, including measurement techniques	Aortic Anatomy, Imaging Technique, Aortic Case Studies	<i>Aorta/IVC Anatomy & Physiology Cases</i> <i>Aorta/IVC Core Clinical Cases</i>
Identify relevant US anatomy including:		
Aorta with major branches, inferior vena cava, and vertebral bodies	<i>Aorta/IVC Anatomy & Physiology:</i> Anatomy, Aortic Sonographic Anatomy, IVC Sonographic Anatomy <i>Aorta/IVC Core Clinical:</i> Aortic Anatomy, IVC Evaluation	<i>Aorta/IVC Anatomy & Physiology Cases</i> <i>Aorta/IVC Core Clinical Cases</i>
Recognize pathologic findings and pitfalls when evaluating for:		
Aortic aneurysm and dissection	Aortic Case Studies	<i>Aorta/IVC Core Clinical Cases</i> <i>RUSH Cases</i> <i>SonoSim LiveScan® Cardiac Resuscitation & Critical Care Cases</i>
Integrate aorta EUS findings into:		
Individual patient and departmental management	--	<i>Aorta/IVC Anatomy & Physiology Cases</i> <i>Aorta/IVC Core Clinical Cases</i>

Echocardiography & HD Assessment		
ACEP Emergency Ultrasound Learning Objective	Echocardiography Courses & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations of:		
Emergency echocardiography	<i>Cardiology:</i> Introduction <i>FoCUS Part I:</i> Introduction <i>Heart:</i> Introduction <i>Resuscitative TEE:</i> Introduction	<i>Resuscitative TEE Cases</i>
Perform standard echocardiography windows and planes:		
Parasternal: Long and Short Axes	<i>Cardiology:</i> Parasternal Long-Axis View, Parasternal Short-Axis View: Mid-Ventricle, Parasternal Short-Axis View: Base <i>FoCUS Part I:</i> Imaging Windows <i>Heart:</i> Sonographic Technique	<i>Heart Cases</i> <i>Cardiology Cases</i> <i>FoCUS Part I Cases</i>
Apical: Four Chamber	<i>Cardiology:</i> Apical Four-Chamber View <i>FoCUS Part I:</i> Imaging Windows <i>Heart:</i> Sonographic Technique	<i>Heart Cases</i> <i>Cardiology Cases</i> <i>FoCUS Part I Cases</i>
Subcostal: Four Chamber and Short Axis	<i>Cardiology:</i> Subcostal Four-Chamber View <i>FoCUS Part I:</i> Imaging Windows <i>Heart:</i> Sonographic Technique	<i>Heart Cases</i> <i>Cardiology Cases</i> <i>FoCUS Part I Cases</i>
Identify relevant US anatomy including:		
Pericardium, cardiac chambers, valves, aorta, and inferior vena cava	<i>Heart:</i> Anatomy, Sonographic Anatomy	<i>Heart Cases</i> <i>Cardiology Cases</i> <i>FoCUS Part I Cases</i>

Guide HD assessment of patient by:		
Estimating qualitative left ventricular function and central venous pressure	<i>Cardiology:</i> Parasternal Long-Axis View, Parasternal Short-Axis View: Mid-Ventricle, Apical Four-Chamber View, Subcostal Four-Chamber View, IVC Evaluation & RAP, Case Studies <i>FoCUS Part I:</i> Pulmonary Artery Pressure Measurements, Case Studies II	<i>Heart Cases</i> <i>Cardiology Cases</i> <i>FoCUS Part I Cases</i>
Recognize:		
Cardiac arrest	<i>Resuscitative TEE:</i> All Lessons	<i>Resuscitative TEE Cases</i> <i>SonoSim LiveScan® Cardiac Resuscitation & Late Stage Pregnancy Cases</i>
Pericardial effusions with or without tamponade	<i>Cardiology:</i> Parasternal Short-Axis View: Mid-Ventricle, Subcostal Four-Chamber View, Case Studies	<i>Cardiology Cases</i> <i>FoCUS Part I Cases</i> <i>eFAST Cases</i> <i>RUSH Cases</i> <i>LVAD Problem-Focused Echocardiography Cases</i> <i>SonoSim LiveScan® Cardiac Resuscitation, Critical Care, Early Stage Pregnancy, Late Stage Pregnancy, & Trauma Care Cases</i>
Dilation of the aortic root or the descending aorta	<i>FoCUS Part I:</i> Imaging Windows	<i>Cardiology Cases</i> <i>SonoSim LiveScan® Cardiac Resuscitation Cases</i>
Integrate emergency echocardiography findings into:		
Individual patient and departmental management	<i>Resuscitative TEE:</i> Case Studies	<i>Cardiology Cases</i> <i>FoCUS Part I Cases</i> <i>Resuscitative TEE Cases</i> <i>SonoSim LiveScan® Cardiac Resuscitation Cases</i>

Biliary Tract		
ACEP Emergency Ultrasound Learning Objective	Intestinal/Biliary Course & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations of EUS of:		
Biliary tract	Introduction, Gallbladder Evaluation, Common Bile Duct Evaluation	--
Perform EUS protocols to evaluate:		
Biliary tract	<i>Biliary Tree:</i> Biliary Physiology <i>Intestinal/Biliary:</i> Gallbladder Evaluation, Common Bile Duct Evaluation	<i>Biliary Tree Cases</i> <i>Intestinal/Biliary Cases</i> <i>Abdomen Challenge Cases</i> <i>SonoSim LiveScan® Hepatobiliary Cases</i>
Identify relevant US anatomy including:		
Gallbladder, portal triad, inferior vena cava, and liver	<i>Biliary Tree:</i> Anatomy, Sonographic Anatomy	<i>Biliary Tree Cases</i> <i>Intestinal/Biliary Cases</i> <i>Abdomen Challenge Cases</i> <i>SonoSim LiveScan® Hepatobiliary Cases</i>
Recognize the relevant findings and pitfalls when evaluating for:		
Cholelithiasis and cholecystitis	Gallbladder Evaluation	<i>Intestinal/Biliary Cases</i> <i>Abdomen Challenge Cases</i> <i>SonoSim LiveScan® Hepatobiliary, Early Stage Pregnancy, & Late Stage Pregnancy Cases</i>

Integrate EUS of the biliary tract into:		
Individual patient and departmental management	--	<i>Biliary Tree Cases</i> <i>Intestinal/Biliary Cases</i> <i>Abdomen Challenge Cases</i> <i>SonoSim LiveScan® Hepatobiliary Cases</i>

Urinary Tract		
ACEP Emergency Ultrasound Learning Objective	Urinary Tract Courses & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations of EUS of the:		
Urinary tract	<i>Bladder Core Clinical:</i> Introduction, Normal Bladder Sonography <i>Renal Core Clinical:</i> Introduction, Renal Imaging	--
Perform EUS protocols to evaluate the:		
Urinary tract	<i>Bladder Core Clinical:</i> Normal Bladder Sonography, Case Pathologies, Bladder Volume Measurement <i>Renal Core Clinical:</i> Renal Imaging, Obstructive Uropathy, Case Studies	<i>Bladder & Renal Anatomy & Physiology Cases</i> <i>Bladder & Renal Core Clinical Cases</i> <i>SonoSim LiveScan® Genitourinary Cases</i>
Identify relevant US anatomy including:		
Renal cortex and renal pelvis	<i>Renal Anatomy & Physiology:</i> Anatomy, Sonographic Anatomy <i>Renal Core Clinical:</i> Anatomy	<i>Renal Anatomy & Physiology Cases</i> <i>Renal Core Clinical Cases</i> <i>Genitourinary Challenge Cases</i> <i>SonoSim LiveScan® Genitourinary Cases</i>
Ureter and bladder	<i>Bladder Anatomy & Physiology:</i> Anatomy, Sonographic Anatomy <i>Bladder Core Clinical:</i> Anatomy	<i>Bladder Anatomy & Physiology Cases</i> <i>Bladder Core Clinical Cases</i> <i>Genitourinary Challenge Cases</i> <i>SonoSim LiveScan® Genitourinary Cases</i>
Liver	<i>Liver:</i> Anatomy, Sonographic Anatomy	<i>Liver Cases</i> <i>Genitourinary Challenge Cases</i>
Spleen	<i>Spleen:</i> Anatomy, Sonographic Anatomy	<i>Spleen Cases</i> <i>Genitourinary Challenge Cases</i>
Recognize the relevant findings and pitfalls when evaluating for:		
Hydronephrosis	<i>Renal Core Clinical:</i> Obstructive Uropathy, Case Studies	<i>Renal Core Clinical Cases</i> <i>Genitourinary Challenge Cases</i> <i>SonoSim LiveScan® Genitourinary, Early Stage Pregnancy, & Late Stage Pregnancy Cases</i>
Renal calculi and masses	<i>Renal Core Clinical:</i> Case Studies	<i>Renal Core Clinical Cases</i> <i>Genitourinary Challenge Cases</i> <i>SonoSim LiveScan® Genitourinary, Early Stage Pregnancy, & Late Stage Pregnancy Cases</i>
Bladder volume	<i>Bladder Core Clinical:</i> Bladder Volume Measurement	<i>Bladder & Renal Core Clinical Cases</i> <i>Genitourinary Challenge Cases</i>
Integrate EUS of the urinary tract into:		
Individual patient and departmental management	--	<i>Bladder & Renal Anatomy & Physiology Cases</i> <i>Bladder & Renal Core Clinical Cases</i> <i>SonoSim LiveScan® Genitourinary Cases</i>

Deep Vein Thrombosis (DVT)		
ACEP Emergency Ultrasound Learning Objective	DVT Course & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations of EUS for:		
Detection of DVT	Introduction, POCUS DVT Examination, Case Studies	--
Perform EUS protocols for the detection of DVT of the lower extremities including:		
Vessel identification	Normal Anatomy & Physiology, Sonographic Technique	<i>DVT Cases</i>
Compression	<i>DVT</i> : Sonographic Anatomy <i>RUSH</i> : The Pipes - DVT	<i>DVT & RUSH Cases</i> <i>SonoSim LiveScan® Critical Care Cases</i>
Doppler imaging of respiratory variation and augmentation	Sonographic Anatomy, Sonographic Technique	<i>DVT & RUSH Cases</i> <i>SonoSim LiveScan® Critical Care Cases</i>
Identify relevant US anatomy of:		
Upper extremities, including the deep venous and arterial systems, major nerves, and lymph nodes	<i>Arm-Arterial & Arm-Venous</i> : Anatomy, Sonographic Technique	<i>Arm-Arterial & Arm-Venous Cases</i>
Lower extremities, including the deep venous and arterial systems, major nerves, and lymph nodes	<i>DVT</i> : Normal Anatomy & Physiology, Sonographic Technique <i>Leg-Arterial & Leg-Venous</i> : Anatomy, Sonographic Technique	<i>DVT Cases</i> <i>Leg-Arterial & Leg-Venous Cases</i>
Recognize the relevant findings and pitfalls when evaluating for:		
DVT	Sonographic Anatomy, Sonographic Technique, POCUS DVT Examination, Case Studies, Imaging Tips and Pitfalls	<i>DVT & RUSH Cases</i> <i>SonoSim LiveScan® Critical Care Cases</i>
Integrate EUS for DVT into:		
Individual patient and departmental management	Management	<i>DVT & RUSH Cases</i> <i>SonoSim LiveScan® Critical Care Cases</i>

*ACEP Emergency Ultrasound Learning Objective not covered: Perform EUS protocols for the detection of DVT of upper extremities

Soft Tissue & Musculoskeletal (MSK)		
ACEP Emergency Ultrasound Learning Objective	MSK & Soft Tissue Courses & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations of EUS for:		
MSK	<i>MSK Core Clinical</i> : Introduction, Tissue Identification	--
Soft tissue	<i>Soft Tissue Core Clinical</i> : Identification of Tissue Types	--
Perform EUS protocols for the evaluation of:		
MSK pathology	<i>MSK Core Clinical</i> : Bone Evaluation, Joint Evaluation, Tendon Evaluation	<i>MSK Core Clinical Cases</i> <i>MSK Challenge Cases</i>
Soft tissue pathology	<i>Soft Tissue Core Clinical</i> : Cellulitis and Abscess Imaging, Advanced Abscess Evaluation, Foreign Bodies, Foreign Body Removal Techniques	<i>Soft Tissue Core Clinical Cases</i> <i>MSK Challenge Cases</i>
Identify relevant US anatomy including:		
Skin, Adipose, Fascia, Muscles, Tendons and Ligaments Lymph Nodes, Bones and Joints	<i>Introduction to MSK</i> : Anatomy & Physiology, Sonographic Anatomy <i>MSK Core Clinical</i> : Tissue Identification <i>Soft Tissue Anatomy & Physiology</i> : Anatomy & Physiology, Sonographic Anatomy <i>Soft Tissue Core Clinical</i> : Identification of Tissue Types	<i>Introduction to MSK, Ankle, Elbow, Foot, Hand & Finger, Hip, Knee, Shoulder, Spine, Wrist, & Soft Tissue Anatomy & Physiology Cases</i> <i>MSK & Soft Tissue Core Clinical Cases</i> <i>MSK Challenge Cases</i>

Recognize the relevant findings and pitfalls when evaluating the following:		
Soft tissue infections: abscess versus cellulitis	<i>Soft Tissue Core Clinical: Cellulitis and Abscess Imaging</i>	<i>Soft Tissue Core Clinical Cases</i>
Subcutaneous fluid collection identification	<i>Soft Tissue Core Clinical: Advanced Abscess Evaluation</i>	<i>MSK Challenge Cases</i>
Foreign body location and removal	<i>Soft Tissue Core Clinical: Foreign Bodies, Foreign Body Removal Techniques</i>	--
Tendon injury (laceration, rupture)	<i>MSK Core Clinical: Tendon Evaluation</i>	<i>MSK Challenge Cases</i>
Fractures	<i>MSK Core Clinical: Bone Evaluation</i>	<i>MSK Core Clinical Cases</i> <i>MSK Challenge Cases</i>
Joint identification	<i>MSK Core Clinical: Joint Evaluation</i> <i>Elbow, Foot, Hand & Finger, Hip, Knee, Shoulder, and Wrist: Anatomy, Sonographic Anatomy</i>	<i>Introduction to MSK, Elbow, Foot, Hand & Finger, Hip, Knee, Shoulder, & Wrist Anatomy & Physiology Cases</i> <i>MSK Core Clinical Cases</i> <i>MSK Challenge Cases</i>
Integrate soft tissue and MSK EUS findings into:		
Individual patient and departmental management	<i>MSK Core Clinical: Effusion Evaluation</i> <i>Soft Tissue Core Clinical: Advanced Abscess Evaluation, Peritonsillar Abscess, Foreign Body Removal Techniques</i>	<i>MSK & Soft Tissue Core Core Clinical Cases</i>

Thoracic - Airway		
ACEP Emergency Ultrasound Learning Objective	Pulmonary Courses & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations of:		
Thoracic EUS	<i>Pulmonary Core Clinical: Introduction, Lung Evaluation</i>	--
Perform EUS protocols for the detection of:		
Pneumothorax	<i>Pulmonary Core Clinical: Pneumothorax Rule-Out, Pneumothorax Rule-In</i> <i>Advanced Pediatric Lung Sonography: Sonographic Anatomy, Case Studies</i>	<i>eFAST Cases</i> <i>Pulmonary Cases</i> <i>RUSH Cases</i> <i>Advanced Pediatric Lung Sonography Cases</i> <i>SonoSim LiveScan® Cardiac Resuscitation, Critical Care, & Trauma Care Cases</i>
Pleural Effusion	<i>Pulmonary Core Clinical: Pleural Effusion</i> <i>Advanced Pediatric Lung Sonography: Sonographic Anatomy, Case Studies</i>	<i>Cardiology & FoCUS Part I Cases</i> <i>eFAST Cases</i> <i>Pulmonary Cases</i> <i>RUSH Cases</i> <i>Advanced Pediatric Lung Sonography Cases</i> <i>SonoSim LiveScan® Cardiac Resuscitation, Critical Care, & Trauma Care Cases</i>
Alveolar Interstitial Syndromes	<i>Pulmonary Core Clinical: Alveolar Interstitial Syndrome</i> <i>Advanced Pediatric Lung Sonography: Sonographic Anatomy, Case Studies</i>	<i>Pulmonary Cases</i> <i>RUSH Cases</i> <i>Advanced Pediatric Lung Sonography Cases</i> <i>Pediatric Challenge Cases</i> <i>SonoSim LiveScan® Cardiac Resuscitation & Critical Care Cases</i>

Identify relevant US anatomy of:		
Thoracic structures	<i>Lungs Anatomy & Physiology: Anatomy, Sonographic Anatomy</i>	<i>Lungs Anatomy & Physiology Cases</i>
Recognize the relevant findings and pitfalls when evaluating for:		
Thoracic pathology	<i>Pulmonary Core Clinical: Lung Evaluation, Imaging Adjuncts, Imaging Artifacts</i> <i>Advanced Pediatric Lung Sonography: Sonographic Anatomy, Imaging Tips & Pitfalls</i>	<i>Pulmonary Cases</i> <i>Pediatric Challenge Cases</i> <i>Advanced Pediatric Lung Sonography Cases</i>
Recognize the sonographic findings of:		
Tracheal and esophageal anatomy, especially in regards to EM procedures	<i>Airway Core Clinical: Imaging Basics, Imaging Adjuncts, Endotracheal Tube Localization, Trachea Imaging, Cricothyroidotomy</i> <i>Upper Airway: Anatomy, Sonographic Anatomy, Sonographic Technique</i>	<i>Airway Core Clinical Cases</i> <i>Upper Airway Cases</i>
Integrate thoracic EUS findings into:		
Individual patient and departmental management	<i>Airway Core Clinical: Endotracheal Tube Localization, Endotracheal Tube Confirmation</i> <i>Pulmonary Core Clinical: Pleural Effusion</i> <i>Advanced Pediatric Lung Sonography: Case Studies</i>	<i>Airway Core Clinical Cases</i> <i>Pulmonary Cases</i> <i>Advanced Pediatric Lung Sonography Cases</i>

Ocular		
ACEP Emergency Ultrasound Learning Objective	Ocular Course & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations of:		
Ocular EUS	Anatomy and Indications	--
Perform EUS protocols for:		
Detection of vitreous hemorrhage, retinal detachment, and other pathology	Ocular Trauma, Retinal Detachment, Vitreous Hemorrhage, Vitreous Detachment, Optic Nerve Evaluation and ICP	<i>Ocular Cases</i> <i>Ocular Challenge Cases</i>
Identify relevant US anatomy of:		
Globe and orbital structures	Anatomy and Indications	<i>Ocular Cases</i> <i>Ocular Challenge Cases</i>
Recognize the relevant findings and pitfalls when evaluating for:		
Ocular pathology	Anatomy and Indications, Scanning Techniques, Ocular Trauma, Retinal Detachment, Vitreous Hemorrhage, Vitreous Detachment, Optic Nerve Evaluation and ICP	<i>Ocular Cases</i> <i>Ocular Challenge Cases</i>
Integrate ocular EUS into:		
Individual patient and departmental management	--	<i>Ocular Cases</i> <i>Ocular Challenge Cases</i>

Procedural Guidance		
ACEP Emergency Ultrasound Learning Objective	Procedures Courses & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations when using US guidance for bedside procedures:		
Vascular access: central and peripheral	<i>Introduction to US-Guided Procedures, US-Guided Internal Jugular Vein Cannulation, US-Guided Subclavian Vein Cannulation, US-Guided Femoral Line Placement, and Peripheral Venous Access: Introduction</i>	--
Confirmation of endotracheal intubation	<i>Airway Core Clinical: Introduction</i>	--
Pericardiocentesis	<i>Pericardiocentesis: Introduction</i>	--
Paracentesis	<i>Paracentesis: Introduction</i>	--
Thoracentesis	<i>Thoracentesis: Introduction</i>	--
Foreign body detection removal	<i>Soft Tissue Core Clinical: Foreign Body Localization</i>	--
Bladder aspiration	<i>Bladder Core Clinical: Ultrasound-Guided Suprapubic Catheterization</i>	--
Abscess identification and drainage	<i>Soft Tissue Core Clinical: Cellulitis and Abscess Imaging, Advanced Abscess Evaluation, Peritonsillar Abscess</i>	--
Perform EUS protocols for procedural guidance including both transverse and longitudinal approaches when appropriate. These procedures may include:		
Vascular access: central and peripheral	<i>US-Guided Internal Jugular Vein Cannulation, US-Guided Subclavian Vein Cannulation, and US-Guided Femoral Line Placement: Procedure Preparation, Procedure Steps, Imaging Adjuncts</i> <i>Peripheral Venous Access: Procedure Preparation, Procedure Steps</i>	<i>US-Guided Internal Jugular Vein Cannulation Cases</i> <i>US-Guided Subclavian Vein Cannulation Cases</i> <i>US-Guided Femoral Line Placement Cases</i> <i>Peripheral Venous Access Cases</i>
Confirmation of endotracheal intubation	<i>Airway Core Clinical: Endotracheal Tube Localization, Endotracheal Intubation Confirmation</i>	<i>Airway Core Clinical Cases</i>
Pericardiocentesis	<i>Pericardiocentesis: All Lessons</i>	<i>Pericardiocentesis Cases</i>
Paracentesis	<i>Paracentesis: All Lessons</i>	<i>Paracentesis Cases</i>
Thoracentesis	<i>Thoracentesis: All Lessons</i>	<i>Thoracentesis Cases</i>
Foreign body detection removal	<i>Soft Tissue Core Clinical: Foreign Bodies, Foreign Body Removal Techniques</i>	--
Bladder aspiration	<i>Bladder Core Clinical: Foley Catheter Placement, Ultrasound-Guided Suprapubic Catheterization</i>	--
Abscess identification and drainage	<i>Soft Tissue Core Clinical: Cellulitis and Abscess Imaging, Advanced Abscess Evaluation, Peritonsillar Abscess</i>	<i>Soft Tissue Core Clinical Cases</i>
Identify relevant US anatomy for:		
Vascular access: central and peripheral	<i>US-Guided Internal Jugular Vein Cannulation, US-Guided Subclavian Vein Cannulation, and US-Guided Femoral Line Placement: Regional Anatomy, Sonographic Anatomy</i> <i>Peripheral Venous Access: Anatomy</i>	<i>US-Guided Internal Juglar Vein Cannulation Cases</i> <i>US-Guided Subclavian Vein Cannulation Cases</i> <i>US-Guided Femoral Line Placement Cases</i> <i>Peripheral Venous Access Cases</i>
Confirmation of endotracheal intubation	<i>Upper Airway: Anatomy, Sonographic Anatomy, Sonographic Technique</i>	<i>Airway Core Clinical Cases</i> <i>Upper Airway Cases</i>
Pericardiocentesis	<i>Pericardiocentesis: Regional Anatomy, Sonographic Anatomy</i>	<i>Pericardiocentesis Cases</i>
Paracentesis	<i>Paracentesis: Regional Anatomy, Sonographic Anatomy</i>	<i>Paracentesis Cases</i>
Thoracentesis	<i>Thoracentesis: Regional Anatomy, Sonographic Anatomy</i>	<i>Thoracentesis Cases</i>

Foreign body detection removal	<i>Soft Tissue Anatomy & Physiology: Anatomy & Physiology, Sonographic Anatomy</i>	<i>Soft Tissue Anatomy & Physiology Cases</i> <i>Soft Tissue Core Clinical Cases</i>
Bladder aspiration	<i>Bladder Anatomy & Physiology: Anatomy, Sonographic Anatomy, Sonographic Technique</i>	<i>Bladder Anatomy & Physiology Cases</i> <i>Bladder Core Clinical Cases</i>
Arthrocentesis	<i>Intro to MSK, Ankle, Elbow, Foot, Hand & Finger, Hip, Knee, Shoulder, Spine, and Wrist: Sonographic Anatomy</i>	<i>Introduction to MSK Cases</i> <i>Ankle, Elbow, Foot, Hand & Finger, Hip, Knee, Shoulder, & Wrist Anatomy & Physiology Cases</i> <i>MSK Core Clinical Cases</i>
Pacemaker placement and capture	<i>Heart: Anatomy, Sonographic Anatomy, Sonographic Technique</i>	<i>Cardiology Cases</i> <i>Heart Anatomy & Physiology Cases</i>
Abscess identification and drainage	<i>Soft Tissue Anatomy & Physiology: Anatomy & Physiology, Sonographic Anatomy</i>	<i>Soft Tissue Anatomy & Physiology Cases</i> <i>Soft Tissue Core Clinical Cases</i>
Recognize the relevant findings and pitfalls when performing EUS for:		
Vascular access: central and peripheral	<i>US-Guided Internal Jugular Vein Cannulation, US-Guided Subclavian Vein Cannulation, US-Guided Femoral Line Placement, and Peripheral Venous Access: Technical Tips & Pitfalls</i>	<i>US-Guided Internal Jugular Vein Cannulation Cases</i> <i>US-Guided Subclavian Vein Cannulation Cases</i> <i>US-Guided Femoral Line Placement Cases</i> <i>Peripheral Venous Access Cases</i>
Confirmation of endotracheal intubation	<i>Airway Core Clinical: Endotracheal Tube Localization, Endotracheal Intubation Confirmation</i>	<i>Airway Core Clinical Cases</i>
Pericardiocentesis	<i>Pericardiocentesis: All Lessons</i>	<i>Pericardiocentesis Cases</i>
Paracentesis	<i>Paracentesis: All Lessons</i>	<i>Paracentesis Cases</i>
Thoracentesis	<i>Thoracentesis: All Lessons</i>	<i>Thoracentesis Cases</i>
Foreign body detection removal	<i>Soft Tissue Core Clinical: Foreign Bodies, Foreign Body Removal Techniques</i>	--
Bladder aspiration	<i>Bladder Core Clinical: Foley Catheter Placement, Ultrasound-Guided Suprapubic Catheterization</i>	--
Abscess identification and drainage	<i>Soft Tissue Core Clinical: Cellulitis and Abscess Imaging, Advanced Abscess Evaluation, Peritonsillar Abscess</i>	<i>Soft Tissue Core Clinical Cases</i>
Integrate EUS for procedural guidance into:		
Individual patient and departmental management	--	<i>All SonoSim Procedure Cases</i>

*ACEP Emergency Ultrasound Learning Objective not covered: Describe the indications and limitations when using US guidance for bedside procedures, perform EUS protocols for procedural guidance including both transverse and longitudinal approaches when appropriate, and recognize the relevant findings and pitfalls when performing EUS for procedural guidance: arthrocentesis and pacemaker placement and capture

Bowel		
ACEP Emergency Ultrasound Learning Objective	Intestinal/Biliary Course & Lessons	SonoSimulator Cases to Scan
Describe the indications and limitations of:		
Bowel EUS	Introduction, Imaging the Intestines	--
Perform EUS protocols for the detection of:		
Appendicitis	Appendicitis	<i>Intestinal/Biliary Cases</i>
Bowel Obstruction	Small Bowel Obstruction	<i>Intestinal/Biliary Cases</i>
Pneumoperitoneum	Pathological Gas	<i>Intestinal/Biliary Cases</i>
Pediatric Intussusception	Intussusception	<i>Intestinal/Biliary Cases</i>
Identify relevant US anatomy of:		
Bowel structures	<i>GI Tract:</i> Anatomy, Sonographic Anatomy, Sonographic Technique <i>Intestinal/Biliary:</i> Imaging the Intestines	<i>GI Tract Cases</i> <i>Intestinal/Biliary Cases</i>
Recognize the relevant findings and pitfalls when evaluating for:		
Bowel pathology	<i>GI Tract:</i> Sonographic Technique <i>Intestinal/Biliary:</i> Appendicitis, Small Bowel Obstruction, Pathological Gas, Intussusception	<i>GI Tract Cases</i> <i>Intestinal/Biliary Cases</i>
Integrate bowel EUS findings into:		
Individual patient and departmental management	--	<i>GI Tract Cases</i> <i>Intestinal/Biliary Cases</i>

*ACEP Emergency Ultrasound Learning Objective not covered: Perform EUS protocols for the detection of: diverticulitis, hernia, and pyloric stenosis