

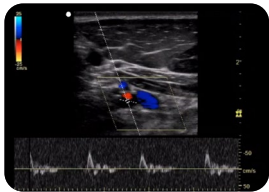


The SonoSim Ultrasound Training Solution in Accordance with AIUM's Curriculum for the Performance of Ultrasound-Guided Procedures

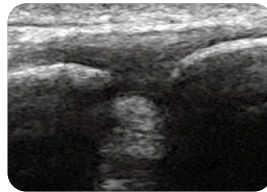
In 2019, a multispecialty task force created by the American Institute of Ultrasound in Medicine (AIUM) produced the [Curriculum for the Performance of Ultrasound-Guided Procedures](#). The goal of this curriculum is to “provide a comprehensive outline for health care providers interested in learning and achieving competency in using ultrasound to guide a variety of procedures.”¹

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.

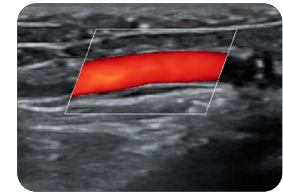
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¹American Institute of Ultrasound in Medicine. Curriculum for the Performance of Ultrasound-Guided Procedures. *Ultrasound Med* 2019; 38:1951–1969. <https://doi.org/10.1002/jum.15089>

Ultrasound Physics		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe the basic physics of ultrasound, including: <i>waves, wavelength, frequency, harmonics, propagation speed, amplitude, intensity, attenuation, absorption, impedance, reflection, refraction, transmission, scattering</i>	<i>Fundamentals of Ultrasound: Basic Ultrasound Physics</i>	<i>All SonoSim Cases</i>

Instrumentation		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe transducer types: <i>linear array, convex array, phased array, vector array</i>	<i>Fundamentals of Ultrasound: Basic Ultrasound Physics</i>	<i>All SonoSim Cases</i>
Describe transducer choices for various applications		
Describe ultrasound instrument functions used for image optimization: <i>preset, frequency, depth, focus, gain, time gain compensation, output power, freeze, calipers/measure, video clips</i>	<i>Fundamentals of Ultrasound: Ultrasound System Operation</i>	
List ultrasound imaging modes and describe their application: <i>brightness B-mode (gray scale), motion M-mode, color Doppler, power Doppler, spectral Doppler</i>	<i>Fundamentals of Ultrasound: Imaging Modes, Doppler-Mode Imaging</i>	

Not Covered for Instrumentation: Describe ultrasound instrument organization: transducer, beam former, signal processor, image processor, display (detail resolution, contrast resolution, temporal resolution)

Artifacts		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
List common types of artifacts occurring with anatomic-gray-scale and Doppler imaging: <i>shadowing, enhancement, comet tail, ringdown, mirror image, reverberation, refraction, speed error, grating lobe, slice (section) thickness, noise, aliasing</i>	<i>Fundamentals of Ultrasound: Imaging Artifacts</i>	<i>All SonoSim Cases</i>
Describe techniques to minimize artifacts		
Describe techniques for determining if an observation is real or artifactual		
List artifacts that are diagnostic		

Safety Considerations		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe thermal and nonthermal bioeffects mechanisms	<i>Fundamentals of Ultrasound: Infection Control & Biosafety</i>	--
Describe the thermal index (TI)		
Describe the mechanical index (MI)		
Explain the ALARA principle		
Describe methods for implementing ALARA		
List official statements regarding patient safety standards and ethical scanning practices		

Image Optimization		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe ultrasound principles and system settings involved in optimizing needle visualization	<i>Introduction to US-Guided Procedures: Procedure Preparation</i>	<i>All SonoSim Procedure Cases</i>
Recognize common ultrasound artifacts encountered when visualizing needles, wires, and catheters	<i>Introduction to US-Guided Procedures: Sonographic Technique</i>	
Demonstrate transducer angulation techniques to make the beam as perpendicular to the needle as possible	<i>Paracentesis: Procedure Preparation</i> <i>Pericardiocentesis: Procedure Steps</i> <i>US-Guided Subclavian Vein Cannulation: Procedure Steps</i>	
Discuss the use of procedural needles with echogenic coatings or surface designs meant to enhance visibility	<i>Introduction to US-Guided Procedures: Procedure Preparation</i>	--
Describe the appearance of a reverberation artifact when using an in-plane (long-axis) or out-of-plane (short-axis) technique	<i>Introduction to US-Guided Procedures: Sonographic Technique</i>	<i>All SonoSim Procedure Cases</i>

Not Covered for Image Optimization: Understand the effect of angle of insonation on needle conspicuity; Describe ultrasound hardware and software features that have been developed to improve needle visualization at steep angles of insonation

Methods of Infection Control		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Explain components of sterile technique	<i>Introduction to US-Guided Procedures: Procedure Preparation</i>	--
Explain components of aseptic technique		
Explain components of clean technique		
Be familiar with the AIUM Official Statement Guidelines for Cleaning and Preparing External-and Internal-Use Ultrasound Probes Between Patients, Safe Handling, and Use of Ultrasound Coupling Gel		

Protocols and Documentation		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Explain standards that apply for interventional procedures (ie, review of prior imaging, appropriate informed consent, site marking as appropriate, use of a local anesthetic as appropriate, and use of aseptic technique)	<i>Introduction to US-Guided Procedures: Introduction, Procedure Preparation</i>	--
Describe infection control management protocols	<i>Introduction to US-Guided Procedures: Procedure Preparation</i>	
List topics that should be discussed as part of obtaining informed consent, including discussion of risks and benefits relevant to the procedure and viable alternative treatments	<i>Introduction to US-Guided Procedures: Introduction</i>	

Not Covered for Protocols and Documentation: Describe facility protocols/requirements for specific procedures; Describe the protocol for marking the transducer location according to the Joint Commission's Universal Protocol for Preventing Wrong Site, Wrong Procedure, and Wrong Person Surgery; List components that should be reviewed in the written request and proper documentation when the performing clinician is also the referring clinician; Describe methods of documentation and reporting of USG procedures, including appropriate labeling and recording of images and videos

Equipment Requirements		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
List the equipment that should be available for the planned procedure	<i>All SonoSim Procedure Courses</i>	<i>All SonoSim Procedure Cases</i>
Compare transducer frequency and footprint options, and explain how to determine which is most appropriate for a procedure	<i>Introduction to US-Guided Procedures: Procedure Preparation</i>	
Describe useful application of spatial compounding/compound imaging, color or power Doppler imaging, and extended field-of-view imaging	<i>Introduction to US-Guided Procedures: Sonographic Technique</i>	
Explain appropriate needle/device selection	<i>Introduction to US-Guided Procedures: Procedure Preparation</i>	
Describe USG needle or device tracking using both in-plane and out-of-plane approaches, including the limitations of each technique and methods to optimize needle visualization		

Clinical Considerations		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Explain general procedural contraindications, including absolute and relative, as well as underlying medical conditions that may be affected by the injectate and local infection, rash, or skin breakdown	<i>All SonoSim Procedure Courses: Introduction</i>	<i>All SonoSim Procedure Cases</i>
Recognize the normal and abnormal ultrasound appearance of tendon, nerve, artery, vein, muscle, bone, and other tissues commonly encountered during USG procedures	<i>All SonoSim Procedure Courses: Sonographic Anatomy</i>	
Perform diagnostic scanning for procedural planning, including: <i>recognition of relevant anatomic variations & unexpected findings, use of Doppler imaging to identify regional vasculature, interpretation & correlation of ultrasound images with available complementary & diagnostic imaging</i>	<i>All SonoSim Procedure Courses: Sonographic Technique</i>	
Recognize and manage procedural complications	<i>All SonoSim Procedure Courses: Technical Tips & Pitfalls, Complications</i>	

Technical Considerations		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe transducer manipulation techniques that are useful during the commonly used in-plane approach to locate a needle and optimize visualization, including:		
Translation, rotation, heel-toe, and oblique standoff	<i>All SonoSim Procedure Courses: Procedure Steps</i>	<i>All SonoSim Procedure Cases</i>
Needle jiggling	<i>Peripheral Venous Access: Technical Tips & Pitfalls</i>	--
Injecting a local anesthetic, sterile saline, or sterile water	<i>All SonoSim Procedure Courses: Procedure Preparation, Procedure Steps</i>	
Using larger-gauge needles or special echogenic needles to increase needle conspicuity	<i>Introduction to US-Guided Procedures: Procedure Preparation</i>	

Not Covered for Technical Considerations: Describe transducer manipulation techniques that are useful during the commonly used in-plane approach to locate a needle and optimize visualization, including: Use of needle enhancement features of the ultrasound machine, Needle rotation, Stylet movement

Joint Aspirations & Injections		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe the purpose(s) of these procedures	<i>Acromioclavicular Joint Injection & Aspiration: Introduction</i> <i>Glenohumeral Joint Injection & Aspiration: Introduction</i> <i>Metatarsophalangeal Joint Injection & Aspiration: Introduction</i> <i>Subacromial-Subdeltoid Bursa Injection & Aspiration: Introduction</i> <i>Tibiotalar Joint Injection & Aspiration: Introduction</i>	<i>Acromioclavicular Joint Injection & Aspiration Cases</i> <i>Glenohumeral Joint Injection & Aspiration Cases</i> <i>Metatarsophalangeal Joint Injection & Aspiration Cases</i> <i>Subacromial-Subdeltoid Bursa Injection & Aspiration Cases</i> <i>Tibiotalar Joint Injection & Aspiration Cases</i>
Discuss general and specific indications for needle placement into a joint and general contraindications	<i>Acromioclavicular Joint Injection & Aspiration: Introduction, Procedure Preparation</i> <i>Glenohumeral Joint Injection & Aspiration: Introduction</i> <i>Metatarsophalangeal Joint Injection & Aspiration: Introduction</i> <i>Subacromial-Subdeltoid Bursa Injection & Aspiration: Introduction</i> <i>Tibiotalar Joint Injection & Aspiration: Introduction</i>	
Explain considerations for USG joint aspiration and injection procedures:		
Describe patient positioning and preprocedural evaluation of the target joint to identify and localize any articular fluid	<i>Acromioclavicular Joint Injection & Aspiration: Procedure Considerations</i> <i>Glenohumeral Joint Injection & Aspiration: Procedure Preparation</i> <i>Metatarsophalangeal Joint Injection & Aspiration: Procedure Preparation</i> <i>Subacromial-Subdeltoid Bursa Injection & Aspiration: Procedure Preparation</i> <i>Tibiotalar Joint Injection & Aspiration: Procedure Preparation</i>	<i>Acromioclavicular Joint Injection & Aspiration Cases</i> <i>Glenohumeral Joint Injection & Aspiration Cases</i> <i>Metatarsophalangeal Joint Injection & Aspiration Cases</i> <i>Subacromial-Subdeltoid Bursa Injection & Aspiration Cases</i> <i>Tibiotalar Joint Injection & Aspiration Cases</i>
Explain how to assess a situation (patient position and regional anatomy, localization of any fluid, proximity of neurovascular structures, and clinician preference) to determine the optimal approach to insert a needle into a joint using ultrasound guidance		
Describe how to use a test injection to confirm intraarticular needle placement and free injectate flow into the joint space	<i>Glenohumeral Joint Injection & Aspiration: Technical Tips & Pitfalls</i> <i>Subacromial-Subdeltoid Bursa Injection & Aspiration: Technical Tips & Pitfalls</i>	--
Describe documentation of a sonographic arthrogram by visualizing distension of the joint recesses sonographically during or after injection		
Describe techniques for targeting sonographically visualized intra-articular synovial tissue	<i>Acromioclavicular Joint Injection & Aspiration: Procedure Steps</i> <i>Glenohumeral Joint Injection & Aspiration: Procedure Steps</i> <i>Metatarsophalangeal Joint Injection & Aspiration: Procedure Steps</i> <i>Subacromial-Subdeltoid Bursa Injection & Aspiration: Procedure Steps</i> <i>Tibiotalar Joint Injection & Aspiration: Procedure Steps</i>	<i>Acromioclavicular Joint Injection & Aspiration Cases</i> <i>Glenohumeral Joint Injection & Aspiration Cases</i> <i>Metatarsophalangeal Joint Injection & Aspiration Cases</i> <i>Subacromial-Subdeltoid Bursa Injection & Aspiration Cases</i> <i>Tibiotalar Joint Injection & Aspiration Cases</i>

Not Covered for Joint Aspirations & Injections: Explain considerations for USG joint aspiration and injection procedures: Describe considerations for repositioning the needle into the fluid using ultrasound guidance during joint aspiration to optimize the yield of the aspiration and avoid needle clogging with synovial tissue or joint debris and when infection is suspected, Describe postprocedural dressing based on preprocedure patient instructions

Tendon, Ligament, and Muscle Procedures		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe the indications/purpose(s) of these procedures	<i>Biceps Tendon Sheath Injection</i> : Introduction <i>Plantar Intrafascial & Perifascial Injections</i> : Introduction	<i>Biceps Tendon Sheath Injection Cases</i> <i>Plantar Intrafascial & Perifascial Injections Cases</i>
Discuss general indications for interventional procedures on tendons, ligaments, and muscles		
Discuss specific indications for these procedures		
Discuss general procedural contraindications	<i>Biceps Tendon Sheath Injection</i> : Procedure Preparation <i>Plantar Intrafascial & Perifascial Injections</i> : Procedure Preparation	
Explain considerations for the choice of the transducer footprint for procedural versatility and optimal skin contact		
Explain considerations for patient positioning to avoid anisotropy or artifactual demonstration of reduced neovascularization and increased resistance to needle passage and injection		
Describe/demonstrate competency at procedures that can be performed after the needle tip has been guided into the target or target area: Injections	<i>Biceps Tendon Sheath Injection</i> : All Lessons <i>Plantar Intrafascial & Perifascial Injections</i> : All Lessons	
Describe sonographic techniques/appearances	<i>Biceps Tendon Sheath Injection</i> : Sonographic Anatomy & Technique, Procedure Preparation, Procedure Steps <i>Plantar Intrafascial & Perifascial Injections</i> : Sonographic Anatomy & Technique, Procedure Preparation, Procedure Steps	
Discuss management of potential challenges and clinical findings	<i>Biceps Tendon Sheath Injection</i> : Technical Tips & Pitfalls, Complications <i>Plantar Intrafascial & Perifascial Injections</i> : Technical Tips & Pitfalls, Complications	

Not Covered for Tendon, Ligament, and Muscle Procedures: Describe/demonstrate competency at procedures that can be performed after the needle tip has been guided into the target or target area: Aspiration, Tenotomy, Lavage and aspiration (barbotage) of calcific tendonitis, Treatment of myofascial pain

Ultrasound-Guided Fluid Aspirations: Thoracentesis and Paracentesis		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
List conditions that may be detected from an analysis of pleural and ascitic fluid and the potential therapeutic/ diagnostic benefits of thoracentesis and paracentesis for these conditions	<i>Paracentesis:</i> Introduction <i>Thoracentesis:</i> Introduction	<i>Paracentesis Cases</i> <i>Thoracentesis Cases</i>
Discuss diagnoses that require fluid evacuation as part of the treatment	<i>Paracentesis:</i> Introduction, Sonographic Anatomy <i>Thoracentesis:</i> Introduction, Sonographic Anatomy	
Discuss the role of ultrasound for assessing the potential therapeutic benefit to fluid aspiration	<i>Paracentesis:</i> Introduction <i>Thoracentesis:</i> Introduction	
Discuss the role of ultrasound for assessing fluid characteristics that can inform diagnosis, necessity of drainage, and the catheter choice	<i>Paracentesis:</i> Sonographic Anatomy, Procedure Preparation, Procedure Steps <i>Thoracentesis:</i> Sonographic Anatomy, Procedure Steps	
Discuss the role of ultrasound for guiding the appropriate entry position to avoid complications	<i>Paracentesis:</i> Procedure Preparation, Procedure Steps <i>Thoracentesis:</i> Procedure Preparation, Procedure Steps	
Discuss the role of ultrasound for assessing the adequacy of and physiologic response to fluid drainage		

Ultrasound-Guided Fluid Aspirations: Thoracentesis and Paracentesis (Cont.)

Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Discuss the role of ultrasound for troubleshooting processes resulting in partial drainage	<i>Paracentesis:</i> Technical Tips & Pitfalls <i>Thoracentesis:</i> Technical Tips & Pitfalls	<i>Paracentesis Cases</i> <i>Thoracentesis Cases</i>
Discuss the role of ultrasound for assessing the adequacy of and physiologic response to fluid drainage		
Discuss the role of ultrasound for evaluating for procedural complications	<i>Paracentesis:</i> Complications <i>Thoracentesis:</i> Complications	
Describe indications/purposes for ultrasound guidance during thoracentesis and paracentesis	<i>Paracentesis:</i> Introduction <i>Thoracentesis:</i> Introduction	
List contraindications for performing USG thoracentesis and paracentesis		
Explain how to choose from available ultrasound guidance approaches for placing a needle into a fluid collection while avoiding neurovascular structures	<i>Paracentesis:</i> Procedure Steps <i>Thoracentesis:</i> Procedure Steps	
Explain how to determine the appropriate needle size and when to perform lavage		
Explain the use of real-time ultrasound guidance to a redirected needle/catheter within a loculated fluid collection to optimize the yield or penetrate/fenestrate structures to facilitate autodecompression	<i>Paracentesis:</i> Procedure Preparation, Procedure Steps <i>Thoracentesis:</i> Procedure Steps	
Explain special considerations in the setting of suspected infected fluid	--	<i>Paracentesis Cases</i>

Not Covered for Ultrasound-Guided Fluid Aspirations: Thoracentesis and Paracentesis: Explain postprocedural insertion site management, including the dressing choice; Explain drain management if a catheter is left in place

Ultrasound-Guided Vascular Access

Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe the purpose(s) of these procedures (peripheral, central, and arterial)	<i>Introduction to US-Guided Procedures: Introduction</i> <i>Peripheral Venous Access: Introduction</i> <i>US-Guided Internal Jugular Vein Cannulation: Introduction</i> <i>US-Guided Subclavian Vein Cannulation: Introduction</i> <i>US-Guided Femoral Line Placement: Introduction</i>	<i>Peripheral Venous Access Cases</i> <i>US-Guided Femoral Line Placement Cases</i> <i>US-Guided Internal Jugular Vein Cannulation Cases</i> <i>US-Guided Subclavian Vein Cannulation Cases</i>
Explain considerations for USG VA procedures:		
Describe general procedural considerations	<i>Introduction to US-Guided Procedures: General Considerations</i> <i>Peripheral Venous Access: Procedure Preparation</i> <i>US-Guided Femoral Line Placement: Procedure Preparation</i> <i>US-Guided Internal Jugular Vein Cannulation: Procedure Preparation</i> <i>US-Guided Subclavian Vein Cannulation: Procedure Preparation</i>	<i>Peripheral Venous Access Cases</i> <i>US-Guided Femoral Line Placement Cases</i> <i>US-Guided Internal Jugular Vein Cannulation Cases</i> <i>US-Guided Subclavian Vein Cannulation Cases</i>
Discuss the choice of the transducer footprint for procedural versatility and optimal skin contact	<i>Introduction to US-Guided Procedures: Procedure Preparation</i> <i>Peripheral Venous Access: Procedure Preparation</i> <i>US-Guided Femoral Line Placement: Procedure Preparation</i> <i>US-Guided Internal Jugular Vein Cannulation: Procedure Preparation</i> <i>US-Guided Subclavian Vein Cannulation: Procedure Preparation</i>	

Ultrasound-Guided Vascular Access (Cont.)		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe patient positioning and preprocedural evaluation of the target joint to identify and reach the desired vascular structure	<i>Peripheral Venous Access: Procedure Preparation, Procedure Steps</i> <i>US-Guided Femoral Line Placement: Procedure Preparation, Procedure Steps</i> <i>US-Guided Internal Jugular Vein Cannulation: Procedure Preparation, Procedure Steps</i> <i>US-Guided Subclavian Vein Cannulation: Procedure Preparation, Procedure Steps</i>	<i>Peripheral Venous Access Cases</i> <i>US-Guided Femoral Line Placement Cases</i> <i>US-Guided Internal Jugular Vein Cannulation Cases</i> <i>US-Guided Subclavian Vein Cannulation Cases</i>
Explain situation assessment (patient position and regional anatomy, localization of any vascular structure, proximity of neurovascular structures, and clinical preference) to determine the optimal approach for a needle to enter a vascular structure using ultrasound guidance	<i>Peripheral Venous Access: All Lessons</i> <i>US-Guided Femoral Line Placement: All Lessons</i> <i>US-Guided Internal Jugular Vein Cannulation: All Lessons</i> <i>US-Guided Subclavian Vein Cannulation: All Lessons</i>	

*Ultrasound-Guided Vascular Access: Discuss general and specific indications for needle placement into a joint and general procedural contraindications – N/A. Erratum of the original AIUM article. SonoSim Courses (US-Guided Femoral Line Placement: Introduction, US-Guided Internal Jugular Vein Cannulation: Introduction, & US-Guided Subclavian Vein Cannulation: Introduction) and SonoSimulator® Cases (Peripheral Venous Access, US-Guided Femoral Line Placement, US-Guided Internal Jugular Vein Cannulation, & US-Guided Subclavian Vein Cannulation) cover discussion of general and specific indications for needle placement into a vessel and general procedural contraindications.

Intubation Guidance and Confirmation, Ultrasound-Assisted Cricothyrotomy, and Tracheostomy Procedures		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe the indications/purpose(s) of these procedures	Airway Core Clinical: Introduction	Airway Core Clinical Cases
Discuss general procedural contraindications		
Explain the airway windows for assessing tracheal and esophageal tube locations	Airway Core Clinical: Sonographic Technique	
Explain the artifact of the tracheal or gastric tube within the neck or airway		
Describe the artifacts explained by the tracheal tube		

*Intubation Guidance and Confirmation, Ultrasound-Assisted Cricothyrotomy, and Tracheostomy Procedures: Describe the surface anatomy of the airway from hypoid to the supersternal notch – N/A. Erratum of original AIUM article. SonoSim Courses (Airway Core Clinical: Introduction, Upper Airway Anatomy & Physiology: Anatomy, Sonographic Anatomy, & Airway Core Clinical: Anatomy, Sonographic Anatomy) and SonoSimulator® Cases (Airway Core Clinical) cover describing the surface anatomy of the airway from hyoid to the suprasternal notch.

Fracture and Joint Reduction Procedures		
Learning Objectives	SonoSim Courses	SonoSimulator® Cases
Describe the indications/purpose(s) of these procedures	<i>Musculoskeletal Core Clinical: Sonographic Anatomy, Sonographic Technique</i>	<i>Musculoskeletal Core Clinical Cases</i>
Discuss specific indications for these procedures	<i>Musculoskeletal Core Clinical: Sonographic Anatomy</i>	
Explain considerations for the choice of the transducer footprint for procedural versatility and optimal skin contact	<i>Musculoskeletal Core Clinical: Sonographic Technique</i>	
Explain considerations for finding the bony cortex and alignment of the cortex in normal and abnormal musculoskeletal sonography	<i>Musculoskeletal Core Clinical: Sonographic Anatomy, Sonographic Technique</i>	
Explain the use of ultrasound to guide the reduction of fracture or joint dislocation	<i>Musculoskeletal Core Clinical: Sonographic Anatomy, Sonographic Technique, Case Studies</i>	
Describe sonographic techniques/appearances of various fractures and dislocations		

Not Covered for Fracture and Joint Reduction Procedures: Discuss general procedural contraindications

Not Covered for Perineural and Spinal Pain Procedures: Describe the purpose(s) of these procedures; List general indications for interventional procedures adjacent to central or peripheral neurologic structures, with evidence, and general procedural contraindications; Discuss considerations for USG perineural procedures: Describe setting, supervision, monitor, and resuscitative equipment requirements to manage complications associated with regional anesthesia and certain perineural injections, Demonstrate expertise in identification of nerves, including differentiation of nerves from surrounding tissues, with recognition of pathologic nerves and anatomic variations, and incidental findings, Describe how to direct the needle trajectory toward the perineural region to minimize the risk of direct nerve penetration, Describe the use of both in-plane and out-of-plane needle tracking to optimize needle guidance accuracy, Explain safety precautions that must be used when physically injecting a local anesthetic and risks of intravascular or intraneural injection, Explain when to stop an injection and reposition the needle if neuropathic pain is encountered, List setting, supervision, monitor, resuscitative equipment, and supplemental oxygen requirements for managing potential complications associated with regional anesthesia in the peri-operative setting, Describe placement of perineural catheters, as well as the indications for their use, sterility requirements and steps to implement, and technical performance details, Explain protocols for postprocedural dressing and drain management; Explain considerations for USG spinal pain medicine procedures: Describe the performance setting, Discuss usefulness to guide procedures in areas of bony surfaces, Compare roles of ultrasound, fluoroscopy, and CT for performing spinal blocks

Not Covered for Fine-Needle Aspiration, Core Biopsy, and Ablative Procedures: Describe the purpose(s) of these applications; List specific indications, general indications related to procedures, and specific risks and contraindications; Describe complications, and summarize guidelines for preprocedure and postprocedure patient care; Demonstrate competency at performing the clinical procedure; Demonstrate competency in appropriate core sample and slide preparation as clinical practice dictates; Explain the role of diagnostic ultrasound before or at the time of the procedure, and discuss the protocols for notification of the referring physician of any unanticipated findings; Identify relevant structures sonographically, and recognize abnormal or suspicious sonographic findings; List appropriate components of an ultrasound report; Demonstrate competency at using ultrasound to guide procedures; Compare the success rates of CT guidance versus ultrasound guidance; compare complication rates of the 2 methods; Describe potential technical challenges to lesion visualization using ultrasound; Describe the role of ultrasound contrast agents

Not Covered for Hernia Reduction Procedures: Describe the indications/purpose(s) of these procedures; Discuss specific indications for these procedures; Discuss general procedural contraindications; Explain considerations for the choice of the transducer footprint for procedural versatility and optimal skin contact; Explain considerations for patient positioning to facilitate the reduction; Describe/demonstrate competency of reduction procedures that can be performed after the hernia has been confirmed by ultrasound; Describe sonographic techniques/appearances of various abdominal wall hernias