



# The SonoSim Ultrasound Training Solution in Accordance with CAAHEP's Vascular Learning Concentration Curriculum Standards

In 2021, a multidisciplinary review board led by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) came together to revise the [Standards and Guidelines for the Accreditation of Educational Programs in Diagnostic Medical Sonography](#). According to CAAHEP, "These accreditation Standards and Guidelines are the minimum standards of quality used in accrediting programs that prepare individuals to enter the Diagnostic Medical Sonography profession."

The award-winning, patented SonoSim Ultrasound Training Solution assists DMS programs in fulfilling these curriculum requirements through an ecosystem of cloud-based courses, knowledge assessments, interactive SonoSimulator® scanning cases, performance tracking, and access to real-patient pathology.

| Vascular Learning Concentration Curriculum Requirements                              |                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Curriculum Requirements                                                              | SonoSim Courses                                                                                                                                                                                                                                                                                                                          | SonoSimulator® Cases                                                                                                                                                                                                                                                                                          |
| Demonstrate knowledge of anatomy and anatomic variants of the cardiovascular system: |                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                               |
| Heart (chambers, valves, vessels)                                                    | <i>Heart Anatomy &amp; Physiology: All Lessons</i>                                                                                                                                                                                                                                                                                       | <i>Heart Cases<br/>Cardiology Cases<br/>eFAST, FAST, &amp; RUSH Cases<br/>FoCUS Part I Cases<br/>SonoSim LiveScan® Cardiac Resuscitation &amp; Critical Care Scenarios</i>                                                                                                                                    |
| Pulmonary circulation                                                                | <i>Lungs Anatomy &amp; Physiology: All Lessons</i>                                                                                                                                                                                                                                                                                       | <i>Lungs Cases<br/>eFAST Cases<br/>SonoSim LiveScan® Critical Care &amp; Trauma Care Scenarios</i>                                                                                                                                                                                                            |
| Vessel structure (arteries, veins, capillaries)                                      | <i>Aorta/IVC Anatomy &amp; Physiology: All Lessons<br/>Arm-Arterial Anatomy &amp; Physiology: All Lessons<br/>Arm-Venous Anatomy &amp; Physiology: All Lessons<br/>Cerebrovascular Anatomy &amp; Physiology: All Lessons<br/>Leg-Arterial Anatomy &amp; Physiology: All Lessons<br/>Leg-Venous Anatomy &amp; Physiology: All Lessons</i> | <i>Aorta/IVC Basic Cases<br/>Arm-Arterial Cases<br/>Arm-Venous Cases<br/>Cerebrovascular Cases<br/>Leg-Arterial Cases<br/>Leg-Venous Cases<br/>All DMS Vascular Protocol Cases</i>                                                                                                                            |
| Aorta and branches                                                                   | <i>Aorta/IVC Anatomy &amp; Physiology: All Lessons</i>                                                                                                                                                                                                                                                                                   | <i>Aorta/IVC Basic Cases<br/>Aorta/IVC Core Clinical Cases<br/>Leg-Arterial Cases<br/>RUSH Cases<br/>FoCUS Part I &amp; II Cases<br/>DMS Abdominal Aorta Protocol Cases<br/>DMS Aortic Iliac Artery Protocol Cases<br/>DMS Mesenteric Artery Protocol Cases<br/>SonoSim LiveScan® Hepatobiliary Scenarios</i> |
| Cerebrovascular                                                                      | <i>Cerebrovascular Anatomy &amp; Physiology: All Lessons</i>                                                                                                                                                                                                                                                                             | <i>Cerebrovascular Cases<br/>DMS Extracranial Cerebrovascular Protocol Cases</i>                                                                                                                                                                                                                              |
| Hepatoportal venous                                                                  | <i>Biliary Tree Anatomy &amp; Physiology: All Lessons<br/>Liver Anatomy &amp; Physiology: All Lessons<br/>Intestinal/Biliary Core Clinical: Anatomy, Sonographic Anatomy</i>                                                                                                                                                             | <i>Biliary Tree Cases<br/>Liver Cases<br/>DMS Liver Vascular Protocol Cases<br/>SonoSim LiveScan® Hepatobiliary Scenarios</i>                                                                                                                                                                                 |

| Curriculum Requirements                                                                       | SonoSim Courses                                                                                                                                                                                                                                                                                         | SonoSimulator® Cases                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mesenteric arterial system                                                                    | <i>Aorta/IVC Anatomy &amp; Physiology: Anatomy, Sonographic Anatomy</i><br><i>GI Tract Anatomy &amp; Physiology: Anatomy</i>                                                                                                                                                                            | <i>Aorta/IVC Basic Cases</i><br><i>Aorta/IVC Core Clinical Cases</i><br><i>Vascular Challenge Cases</i><br><i>DMS Mesenteric Artery Protocol Cases</i><br><i>SonoSim LiveScan® Hepatobiliary Scenarios</i>                                                                                                                                                                                                                                                                                                                                                             |
| Peripheral arterial                                                                           | <i>Arm-Arterial Anatomy &amp; Physiology: All Lessons</i><br><i>Leg-Arterial Anatomy &amp; Physiology: All Lessons</i>                                                                                                                                                                                  | <i>Arm-Arterial Cases</i><br><i>Leg-Arterial Cases</i><br><i>DMS Lower Extremity Arterial Protocol Cases</i><br><i>DMS Upper Extremity Arterial Protocol Cases</i>                                                                                                                                                                                                                                                                                                                                                                                                     |
| Peripheral venous                                                                             | <i>Arm-Venous Anatomy &amp; Physiology: All Lessons</i><br><i>Leg-Venous Anatomy &amp; Physiology: All Lessons</i>                                                                                                                                                                                      | <i>Arm-Venous Cases</i><br><i>Leg-Venous Cases</i><br><i>DMS Lower Extremity Venous Protocol Cases</i><br><i>DMS Upper Extremity Venous Protocol Cases</i>                                                                                                                                                                                                                                                                                                                                                                                                             |
| Renal vessels                                                                                 | <i>Aorta/IVC Anatomy &amp; Physiology: All Lessons</i><br><i>Renal Anatomy &amp; Physiology: All Lessons</i>                                                                                                                                                                                            | <i>Aorta/IVC Basic Cases</i><br><i>Renal Basic Cases</i><br><i>DMS Renal Artery Protocol Cases</i><br><i>SonoSim LiveScan® Hepatobiliary Scenarios</i>                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Vena cava and iliac veins                                                                     | <i>Aorta/IVC Anatomy &amp; Physiology: All Lessons</i>                                                                                                                                                                                                                                                  | <i>Aorta/IVC Basic Cases</i><br><i>Aorta/IVC Core Clinical Cases</i><br><i>Leg-Venous Cases</i><br><i>Renal Basic Cases</i><br><i>RUSH Cases</i><br><i>FoCUS Part I &amp; II Cases</i><br><i>DMS Abdominal Aorta Protocol Cases</i><br><i>SonoSim LiveScan® Hepatobiliary Scenarios</i>                                                                                                                                                                                                                                                                                |
| Demonstrate knowledge of normal and abnormal peripheral vascular physiology and hemodynamics: |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Principles of pressure, flow, and resistance                                                  | <i>Aorta/IVC Anatomy &amp; Physiology: Introduction</i><br><i>Arm-Arterial Anatomy &amp; Physiology: Physiology</i><br><i>Arm-Venous Anatomy &amp; Physiology: Physiology</i><br><i>Cerebrovascular Anatomy &amp; Physiology: Physiology</i><br><i>Heart Anatomy &amp; Physiology: Heart Physiology</i> | <i>All SonoSim Vascular Cases</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Pulsatile flow                                                                                | <i>Aorta/IVC Anatomy &amp; Physiology: Physiology</i><br><i>Arm-Arterial Anatomy &amp; Physiology: Sonographic Anatomy</i><br><i>Leg-Arterial Anatomy &amp; Physiology: Sonographic Anatomy</i>                                                                                                         | <i>Aorta/IVC Basic Cases</i><br><i>Arm-Arterial Cases</i><br><i>Leg-Arterial Cases</i><br><i>Predialysis Vascular Mapping Cases</i><br><i>US-Guided Femoral Line Placement Cases</i><br><i>US-Guided Internal Jugular Vein Cannulation Cases</i><br><i>DMS Abdominal Aorta Protocol Cases</i><br><i>DMS Extracranial Cerebrovascular Protocol Cases</i><br><i>DMS Lower Extremity Arterial Protocol Cases</i><br><i>DMS Mesenteric Artery Protocol Cases</i><br><i>DMS Upper Extremity Arterial Protocol Cases</i><br><i>SonoSim LiveScan® Critical Care Scenarios</i> |

| Curriculum Requirements                                                                                      | SonoSim Courses                                                                                                                                                                                                                                                                                                                                                                                           | SonoSimulator® Cases                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Laminar and non-laminar flow patterns                                                                        | <i>Arm-Arterial Anatomy &amp; Physiology: Physiology</i><br><i>Arm-Venous Anatomy &amp; Physiology: Sonographic Technique</i><br><i>Leg-Arterial Anatomy &amp; Physiology: Physiology, Sonographic Anatomy</i><br><i>Leg-Venous Anatomy &amp; Physiology: Sonographic Technique</i><br><i>DVT – Lower Extremity: Sonographic Technique</i>                                                                | <i>All SonoSim Vascular Cases</i>                                                                                                                                                                |
| Bernoulli's principle                                                                                        | <i>FoCUS Part I: Pulmonary Artery Pressure Measurement, Case Studies II</i><br><i>FoCUS Part II: Valvular Stenosis</i>                                                                                                                                                                                                                                                                                    | <i>FoCUS Part II Cases</i>                                                                                                                                                                       |
| Cardiac influence on flow                                                                                    | <i>Arm-Arterial Anatomy &amp; Physiology: Physiology</i><br><i>Arm-Venous Anatomy &amp; Physiology: Physiology</i><br><i>Heart Anatomy &amp; Physiology: Heart Physiology</i><br><i>Leg-Arterial Anatomy &amp; Physiology: Physiology</i><br><i>Leg-Venous Anatomy &amp; Physiology: Physiology</i><br><i>FoCUS Part I: Cardiac Output Measurements</i><br><i>FoCUS Part II: Anatomy &amp; Physiology</i> | <i>Heart Cases</i><br><i>FoCUS Part I &amp; II Cases</i>                                                                                                                                         |
| Occlusive diseases                                                                                           | <i>DVT – Lower Extremity: All Lessons</i>                                                                                                                                                                                                                                                                                                                                                                 | <i>DVT – Lower Extremity Cases</i><br><i>Vascular Challenge Cases</i><br><i>SonoSim LiveScan® Critical Care Scenarios</i>                                                                        |
| Systemic diseases and other conditions                                                                       | <i>DVT – Lower Extremity: Sonographic Anatomy, Case Studies</i><br><i>Predialysis Vascular Mapping: Imaging Tips &amp; Pitfalls</i>                                                                                                                                                                                                                                                                       | <i>DVT – Lower Extremity Cases</i>                                                                                                                                                               |
| Venous physiology, valve function, calf pump                                                                 | <i>Arm-Venous Anatomy &amp; Physiology: Physiology</i><br><i>Leg-Venous Anatomy &amp; Physiology: Physiology, Sonographic Anatomy</i><br><i>DVT – Lower Extremity: Normal Anatomy &amp; Physiology, Sonographic Anatomy</i>                                                                                                                                                                               | <i>Arm-Venous Cases</i><br><i>Leg-Venous Cases</i><br><i>DVT – Lower Extremity Cases</i><br><i>DMS Lower Extremity Venous Protocol Cases</i><br><i>DMS Upper Extremity Venous Protocol Cases</i> |
| Demonstrate knowledge of mechanisms of vascular diseases, vascular pathophysiology, and hemodynamic effects: |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                  |
| Aneurysm and pseudoaneurysm                                                                                  | <i>Aorta/IVC Core Clinical: Case Studies</i><br><i>RUSH: Sonographic Technique</i>                                                                                                                                                                                                                                                                                                                        | <i>Aorta/IVC Core Clinical Cases</i><br><i>RUSH Cases</i><br><i>Vascular Challenge Cases</i><br><i>SonoSim LiveScan® Cardiac Resuscitation &amp; Critical Care Scenarios</i>                     |
| Arterial embolism                                                                                            | <i>Pulmonary Core Clinical: Case Studies Lung Consolidation</i>                                                                                                                                                                                                                                                                                                                                           | <i>SonoSim LiveScan® Cardiac Resuscitation Scenarios</i>                                                                                                                                         |
| Arteriovenous fistulae and shunts                                                                            | <i>Predialysis Vascular Mapping: All Lessons</i>                                                                                                                                                                                                                                                                                                                                                          | <i>Predialysis Vascular Mapping Cases</i>                                                                                                                                                        |
| Iatrogenic injury                                                                                            | <i>Pericardiocentesis: Complications</i><br><i>Peripheral Venous Access: Technical Tips and Pitfalls</i><br><i>US-Guided Femoral Line Placement: Technical Tips and Pitfalls</i><br><i>US-Guided Internal Jugular Vein Cannulation: Technical Tips and Pitfalls</i><br><i>US-Guided Subclavian Vein Cannulation: Technical Tips and Pitfalls</i>                                                          | --                                                                                                                                                                                               |
| Infection                                                                                                    | <i>Pericardiocentesis: Complications</i><br><i>US-Guided Femoral Line Placement: Technical Tips and Pitfalls</i><br><i>US-Guided Internal Jugular Vein Cannulation: Technical Tips and Pitfalls</i><br><i>US-Guided Subclavian Vein Cannulation: Technical Tips and Pitfalls</i>                                                                                                                          |                                                                                                                                                                                                  |
| Systemic hypertension                                                                                        | <i>FoCUS Part I: Pulmonary Artery Pressure Measurements, Case Studies II</i>                                                                                                                                                                                                                                                                                                                              | <i>FoCUS Part I &amp; II Cases</i>                                                                                                                                                               |

| Curriculum Requirements                                                                                                                                                   | SonoSim Courses                                                                                                                                                                                                                                                                                                                                                                      | SonoSimulator® Cases                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trauma                                                                                                                                                                    | <i>FAST: Case Studies</i><br><i>eFAST: Case Studies</i><br><i>RUSH: Sonographic Technique</i>                                                                                                                                                                                                                                                                                        | <i>eFAST Cases</i><br><i>FAST Cases</i><br><i>SonoSim LiveScan® Trauma Care Scenarios</i>                                                                                                                                                     |
| Venous thromboembolism                                                                                                                                                    | <i>DVT – Lower Extremity: All Lessons</i>                                                                                                                                                                                                                                                                                                                                            | <i>DVT – Lower Extremity Cases</i>                                                                                                                                                                                                            |
| Demonstrate knowledge of sonographic appearances, sonographic techniques, measurements, and Doppler flow characteristics in both normal and abnormal vascular structures: |                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                               |
| Aorta and branches                                                                                                                                                        | <i>Aorta/IVC Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>Aorta/IVC Core Clinical: Imaging Technique</i>                                                                                                                                                                                                                                           | <i>Aorta/IVC Basic Cases</i><br><i>Aorta/IVC Core Clinical Cases</i><br><i>DMS Abdominal Aorta Protocol Cases</i><br><i>DMS Aortic Iliac Artery Cases</i><br><i>DMS Mesenteric Artery Protocol Cases</i>                                      |
| Cerebrovascular                                                                                                                                                           | <i>Cerebrovascular Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i>                                                                                                                                                                                                                                                                                          | <i>Cerebrovascular Cases</i><br><i>Vascular Challenge Cases</i><br><i>DMS Extracranial Cerebrovascular Protocol Cases</i>                                                                                                                     |
| Hepatoportal venous                                                                                                                                                       | <i>Biliary Tree Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>Liver Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>Intestinal/Biliary Core Clinical: Sonographic Anatomy, Sonographic Technique, Case Studies</i>                                                                                                   | <i>Biliary Tree Cases</i><br><i>Liver Cases</i><br><i>Aorta/IVC Core Clinical Cases</i><br><i>Intestinal/Biliary Core Clinical Cases</i><br><i>DMS Liver Vascular Protocol Cases</i><br><i>SonoSim LiveScan® Hepatobiliary Scenarios</i>      |
| Mesenteric arterial system                                                                                                                                                | <i>Aorta/IVC Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i>                                                                                                                                                                                                                                                                                                | <i>Aorta/IVC Basic Cases</i><br><i>Aorta/IVC Core Clinical Cases</i><br><i>Vascular Challenge Cases</i><br><i>DMS Mesenteric Artery Protocol Cases</i><br><i>SonoSim LiveScan® Critical Care Scenarios</i>                                    |
| Peripheral arterial                                                                                                                                                       | <i>Arm-Arterial Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>Leg-Arterial Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>Predialysis Vascular Mapping: Sonographic Anatomy, Sonographic Technique</i>                                                                                                              | <i>Arm-Arterial Cases</i><br><i>Leg-Arterial Cases</i><br><i>Predialysis Vascular Mapping Cases</i><br><i>DMS Lower Extremity Arterial Protocol Cases</i><br><i>DMS Upper Extremity Arterial Protocol Cases</i>                               |
| Peripheral venous                                                                                                                                                         | <i>Arm-Venous Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>Leg-Venous Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>DVT – Lower Extremity: Sonographic Anatomy, Sonographic Technique, POCUS DVT Examination, Case Studies</i><br><i>Predialysis Vascular Mapping: Sonographic Anatomy, Sonographic Technique</i> | <i>Arm-Venous Cases</i><br><i>Leg-Venous Cases</i><br><i>DVT – Lower Extremity Cases</i><br><i>Predialysis Vascular Mapping Cases</i><br><i>DMS Lower Extremity Venous Protocol Cases</i><br><i>DMS Upper Extremity Venous Protocol Cases</i> |
| Renal vessels                                                                                                                                                             | <i>Aorta/IVC Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>Renal Anatomy &amp; Physiology: Sonographic Anatomy, Sonographic Technique</i><br><i>Renal Core Clinical: Sonographic Anatomy, Sonographic Technique, Obstructive Uropathy, Case Studies</i>                                                                                             | <i>Aorta/IVC Basic Cases</i><br><i>Renal Basic Cases</i><br><i>Renal Core Clinical Cases</i><br><i>DMS Renal Artery Protocol Cases</i><br><i>SonoSim LiveScan® Hepatobiliary Scenarios</i>                                                    |

| Curriculum Requirements                                                                                  | SonoSim Courses                                                                                                                                                                                                                                                                                                                                                                       | SonoSimulator® Cases                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vena cava and iliac veins                                                                                | <i>Aorta/IVC Anatomy &amp; Physiology:</i> Sonographic Anatomy, Sonographic Technique<br><i>Leg-Venous Anatomy &amp; Physiology:</i> Sonographic Technique<br><i>Aorta/IVC Core Clinical:</i> Imaging Technique, Case Studies, IVC Evaluation & CVP                                                                                                                                   | <i>Aorta/IVC Basic Cases</i><br><i>Aorta/IVC Core Clinical Cases</i><br><i>Leg-Venous Cases</i><br><i>Renal Basic Cases</i><br><i>RUSH Cases</i><br><i>FoCUS Part I &amp; II Cases</i><br><i>DMS Abdominal Aorta Protocol Cases</i><br><i>SonoSim LiveScan® Hepatobiliary Scenarios</i>  |
| Demonstrate knowledge of physiologic vascular testing principles and techniques:                         |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                          |
| Continuous-wave and pulse Doppler                                                                        | <i>Arm-Arterial Anatomy &amp; Physiology:</i> Sonographic Anatomy<br><i>Arm-Venous Anatomy &amp; Physiology:</i> Sonographic Technique<br><i>DVT – Lower Extremity:</i> Sonographic Technique<br><i>FoCUS Part I:</i> Doppler Ultrasound<br><i>FoCUS Part II:</i> Doppler Imaging<br><i>Predialysis Vascular Mapping:</i> Sonographic Anatomy                                         | <i>Aorta/IVC Basic Cases</i><br><i>Aorta/IVC Core Clinical Cases</i><br><i>DVT – Lower Extremity Cases</i><br><i>FoCUS Part I &amp; II Cases</i><br><i>Predialysis Vascular Mapping Cases</i><br><i>Vascular Challenge Cases</i><br><i>All DMS Vascular Protocol Cases</i>               |
| Pressure measurements, including ankle/brachial index                                                    | <i>Cardiology Core Clinical:</i> IVC Window<br><i>FoCUS Part I:</i> Pulmonary Artery Pressure Measurements, Case Studies II<br><i>FoCUS Part II:</i> Valvular Stenosis, Valvular Regurgitation                                                                                                                                                                                        | <i>Cardiology Cases</i><br><i>FoCUS Part I &amp; II Cases</i>                                                                                                                                                                                                                            |
| Segmental pressure and waveform analysis                                                                 | <i>Arm-Arterial Anatomy &amp; Physiology:</i> Sonographic Anatomy<br><i>Leg-Arterial Anatomy &amp; Physiology:</i> Sonographic Anatomy<br><i>DVT – Lower Extremity:</i> POCUS DVT Examination<br><i>Predialysis Vascular Mapping:</i> Sonographic Anatomy                                                                                                                             | <i>DVT – Lower Extremity Cases</i><br><i>Predialysis Vascular Mapping Cases</i><br><i>Vascular Challenge Cases</i><br><i>DMS Extracranial Cerebrovascular Protocol Cases</i><br><i>DMS Lower Extremity Arterial Protocol Cases</i><br><i>DMS Upper Extremity Arterial Protocol Cases</i> |
| Demonstrate knowledge and application in the use of quantitative principles applied to vascular testing: |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                          |
| Acceleration time                                                                                        | <i>FoCUS Part II:</i> Doppler Imaging                                                                                                                                                                                                                                                                                                                                                 | --                                                                                                                                                                                                                                                                                       |
| Area and diameter reduction measurements                                                                 | <i>Leg-Venous Anatomy &amp; Physiology:</i> Sonographic Anatomy<br><i>DVT – Lower Extremity:</i> Sonographic Anatomy<br><i>Predialysis Vascular Mapping:</i> Sonographic Technique                                                                                                                                                                                                    | <i>Predialysis Vascular Mapping Cases</i><br><i>Vascular Challenge Cases</i>                                                                                                                                                                                                             |
| Volume flow                                                                                              | <i>Arm-Arterial Anatomy &amp; Physiology:</i> Physiology<br><i>Arm-Venous Anatomy &amp; Physiology:</i> Physiology, Sonographic Anatomy<br><i>Heart Anatomy &amp; Physiology:</i> Heart Physiology<br><i>FoCUS Part I:</i> Cardiac Output Measurements<br><i>FoCUS Part II:</i> Valvular Stenosis, Valvular Regurgitation<br><i>Predialysis Vascular Mapping:</i> Sonographic Anatomy | <i>FoCUS Part I &amp; II Cases</i><br><i>Predialysis Vascular Mapping Cases</i>                                                                                                                                                                                                          |
| Demonstrate knowledge in US-Guided procedures:                                                           |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                          |
| Role of sonographer                                                                                      | <i>Introduction to US-Guided Procedures:</i> All Lessons                                                                                                                                                                                                                                                                                                                              | <i>All SonoSim Procedure Cases</i>                                                                                                                                                                                                                                                       |
| Clinical information                                                                                     | <i>All SonoSim Procedure Courses</i>                                                                                                                                                                                                                                                                                                                                                  | --                                                                                                                                                                                                                                                                                       |
| Informed consent                                                                                         | <i>Introduction to US-Guided Procedures:</i> Introduction                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                          |

| Curriculum Requirements                                                                                                                                                                                                          | SonoSim Courses                                                                                                                                                                                                                                       | SonoSimulator® Cases                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Procedural time out                                                                                                                                                                                                              | US-Guided Femoral Line Placement: Procedure Preparation<br>US-Guided Internal Jugular Vein Cannulation: Procedure Preparation<br>US-Guided Subclavian Vein Cannulation: Procedure Preparation                                                         | --                                                                                                      |
| Sterile technique                                                                                                                                                                                                                | Introduction to US-Guided Procedures: Procedure Preparation                                                                                                                                                                                           |                                                                                                         |
| Pre- and post-procedure documentation                                                                                                                                                                                            | Predialysis Vascular Mapping: Sonographic Technique<br>US-Guided Subclavian Vein Cannulation: Procedure Steps                                                                                                                                         |                                                                                                         |
| Demonstrate knowledge of the role of ultrasound for evaluation of vascular surgical procedures or interventions, including a role in planning, intra-procedural guidance/technical evaluation, and/or post-procedure assessment: |                                                                                                                                                                                                                                                       |                                                                                                         |
| Dialysis fistula/graft                                                                                                                                                                                                           | Predialysis Vascular Mapping: All Lessons                                                                                                                                                                                                             | Predialysis Vascular Mapping Cases                                                                      |
| Endovascular aortic aneurysm repair (EVAR)                                                                                                                                                                                       | Aorta/IVC Core Clinical: Case Studies                                                                                                                                                                                                                 | Aorta/IVC Core Clinical Cases                                                                           |
| Evaluate scanning protocol and modification(s) based on patient-specific factors:                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                         |
| History, including indication, prior vascular procedures                                                                                                                                                                         | All SonoSim Vascular Courses                                                                                                                                                                                                                          | All SonoSim Vascular Cases                                                                              |
| Physical examination and assessment of patient-specific factors                                                                                                                                                                  | All SonoSim Courses                                                                                                                                                                                                                                   | All SonoSim Cases                                                                                       |
| Contraindications                                                                                                                                                                                                                | DVT – Lower Extremity: Management<br>Predialysis Vascular Mapping: Introduction<br>US-Guided Femoral Line Placement: Introduction<br>US-Guided Internal Jugular Vein Cannulation: Introduction<br>US-Guided Subclavian Vein Cannulation: Introduction | --                                                                                                      |
| Clinical differential diagnosis                                                                                                                                                                                                  | DVT – Lower Extremity: Introduction                                                                                                                                                                                                                   |                                                                                                         |
| Role of ultrasound in patient management                                                                                                                                                                                         | All SonoSim Vascular Courses                                                                                                                                                                                                                          | All SonoSim Vascular Cases                                                                              |
| Pharmacology                                                                                                                                                                                                                     | DVT – Lower Extremity: Management                                                                                                                                                                                                                     | --                                                                                                      |
| Demonstrate proficiency in the technique of:                                                                                                                                                                                     |                                                                                                                                                                                                                                                       |                                                                                                         |
| Upper extremity arterial duplex                                                                                                                                                                                                  | Arm-Arterial Anatomy & Physiology: Sonographic Anatomy, Sonographic Technique<br>Predialysis Vascular Mapping: Sonographic Anatomy, Sonographic Technique                                                                                             | Arm-Arterial Cases<br>Predialysis Vascular Mapping Cases<br>DMS Upper Extremity Arterial Protocol Cases |
| Palmar arch                                                                                                                                                                                                                      | Predialysis Vascular Mapping: Imaging Tips and Pitfalls                                                                                                                                                                                               | --                                                                                                      |
| Vessel mapping                                                                                                                                                                                                                   | Predialysis Vascular Mapping: All Lessons                                                                                                                                                                                                             | Predialysis Vascular Mapping Cases                                                                      |
| Visceral vascular                                                                                                                                                                                                                | Aorta/IVC Anatomy & Physiology: Sonographic Anatomy, Sonographic Technique<br>Renal Anatomy & Physiology: Sonographic Technique<br>Aorta/IVC Core Clinical: Anatomy, Imaging Technique, Case Studies                                                  | Aorta/IVC Basic Cases<br>Aorta/IVC Core Clinical Cases<br>SonoSim LiveScan® Genitourinary Scenarios     |

| Curriculum Requirements                                                                                                                                                                                                                                                                                                        | SonoSim Courses                                                                                      | SonoSimulator® Cases                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Demonstrate achievement of clinical competency through the performance of sonographic examinations of the vascular system according to practice parameters established by national professional organizations and the protocol of the clinical affiliates. Clinical competencies must include evaluation and documentation of: |                                                                                                      |                                                                                                                          |
| Identification of anatomical and relational structures                                                                                                                                                                                                                                                                         | <i>All SonoSim Vascular Courses</i>                                                                  | <i>All SonoSim Vascular Cases</i>                                                                                        |
| Differentiation of normal from pathological/disease process                                                                                                                                                                                                                                                                    |                                                                                                      |                                                                                                                          |
| Image optimization in grayscale, color Doppler and spectral Doppler                                                                                                                                                                                                                                                            |                                                                                                      |                                                                                                                          |
| Measurement techniques                                                                                                                                                                                                                                                                                                         |                                                                                                      |                                                                                                                          |
| Vascular competencies: Extracranial cerebrovascular including vertebral vessels                                                                                                                                                                                                                                                | <i>Cerebrovascular Anatomy &amp; Physiology: All Lessons</i>                                         | <i>Cerebrovascular Cases</i><br><i>DMS Extracranial Cerebrovascular Protocol Cases</i>                                   |
| Vascular competencies: Aortoiliac duplex                                                                                                                                                                                                                                                                                       | <i>Leg-Arterial Anatomy and Physiology: Sonographic Technique</i>                                    | <i>Leg-Arterial Cases</i>                                                                                                |
| Vascular competencies: Lower extremity arterial duplex                                                                                                                                                                                                                                                                         | <i>Leg-Arterial Anatomy and Physiology: All Lessons</i>                                              | <i>Leg-Arterial Cases</i><br><i>DMS Lower Extremity Arterial Protocol Cases</i>                                          |
| Vascular competencies: Lower extremity venous duplex                                                                                                                                                                                                                                                                           | <i>Leg-Venous Anatomy &amp; Physiology: All Lessons</i><br><i>DVT – Lower Extremity: All Lessons</i> | <i>Leg-Venous Cases</i><br><i>DVT – Lower Extremity Cases</i><br><i>DMS Lower Extremity Venous Protocol Cases</i>        |
| Vascular competencies: Upper extremity venous duplex                                                                                                                                                                                                                                                                           | <i>Arm-Venous Anatomy &amp; Physiology: All Lessons</i>                                              | <i>Arm-Venous Cases</i><br><i>Predialysis Vascular Mapping Cases</i><br><i>DMS Upper Extremity Venous Protocol Cases</i> |

*Not Covered:*

*Demonstrate knowledge of normal and abnormal peripheral vascular physiology and hemodynamics: Poiseuille's law, Reynold's number, Collateral circulation, Exercise and hyperemia*

*Demonstrate knowledge of mechanisms of vascular diseases, vascular pathophysiology, and hemodynamic effects: Atherosclerosis, Congenital anomalies, Fibromuscular dysplasia, Genetic disorders, Intimal hyperplasia, Ischemia, Neoplasia, Organ transplantation, Pharmacologic alterations, Portal hypertension, Vascular entrapment and extrinsic compression, Vascular malformations, Vasculitis, Vasospastic disorders, Venous valvular disorders*

*Demonstrate knowledge of physiologic vascular testing principles and techniques: Pneumoplethysmography (pulse volume recording), Exercise treadmill testing, Photoplethysmography (PPG), arterial and venous, Air plethysmography, venous, Laser Doppler, including skin perfusion pressure measurements*

*Demonstrate knowledge and application in the use of quantitative principles applied to vascular testing: Ankle/brachial pressure ratios, Aorta/renal ratios, Digit/brachial indices, Velocity change across stenosis for grading arterial lesions, Pulsatility index, Resistive index, Segmental pressures, including digits, Velocity ratios, Venous reflux time*

*Demonstrate knowledge in US-Guided procedures: Superficial vein ablation, Use of thrombin injection for pseudoaneurysm treatment*

*Demonstrate knowledge of the role of ultrasound for evaluation of vascular surgical procedures or interventions, including a role in planning, intra-procedural guidance/technical evaluation, and/or post-procedure assessment: Angioplasty, Atherectomy, Coil embolization, Embolectomy, Endarterectomy, Endovenous ablation, Inferior vena cava filter, Patch angioplasty, Stents, Synthetic grafts, Thrombolysis and thrombectomy, Trans-jugular intrahepatic porto-systemic shunt, Vein bypass grafts*

*Evaluate scanning protocol and modification(s) based on patient-specific factors: Related imaging, laboratory, and functional testing procedures*

*Demonstrate knowledge and application of quality assurance and statistical tests used in a vascular laboratory: Correlations of clinical findings and other imaging examinations, Accuracy, Sensitivity, Specificity, Positive predictive value, Negative predictive value, Quality improvement program components, including test appropriateness, evaluation of the technical quality and compliance with protocols*

*Demonstrate proficiency in the technique of: Intracranial cerebrovascular, Upper extremity and digital arterial physiologic testing, Lower extremity and digital arterial physiologic testing, Lower extremity exercise testing*

*Demonstrate achievement of clinical competency through the performance of sonographic examinations of the vascular system according to practice parameters established by national professional organizations and the protocol of the clinical affiliates. Clinical competencies must include evaluation and documentation of: Vascular competencies: Ankle and brachial pressures/ABI, Vascular competencies: Lower extremity venous insufficiency testing*

SonoSim also covers several sections of the **Learning Competencies Common to All Concentrations**, including ultrasound physics, medical terminology, normal anatomy and pathologic conditions, and basic patient care, such as patient positioning and infection control.

| Learning Competencies Common to All Concentrations                               |                                                                       |                                            |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------|
| Curriculum Requirements                                                          | SonoSim Courses                                                       | SonoSimulator® Cases                       |
| Demonstrate knowledge and application of ergonomic techniques:                   |                                                                       |                                            |
| Patient positioning                                                              | All SonoSim Courses                                                   | All SonoSim Cases                          |
| Equipment and accessories                                                        |                                                                       |                                            |
| Supports, tools, and devices                                                     |                                                                       |                                            |
| Transducer grip and pressure                                                     |                                                                       | --                                         |
| Demonstrate knowledge and application of types and methods of infection control: |                                                                       |                                            |
| Standard precautions                                                             | All SonoSim Courses                                                   | --                                         |
| Aseptic and sterile technique                                                    | Fundamentals of Ultrasound: Infection Control & Biosafety             |                                            |
| Equipment                                                                        |                                                                       |                                            |
| Transducer cleaning and disinfection                                             |                                                                       |                                            |
| Accessories                                                                      |                                                                       |                                            |
| Demonstrate knowledge and application of patient care:                           |                                                                       |                                            |
| Compliance with program and clinical education facility policies and procedures  | All SonoSim Courses                                                   | All SonoSim Cases                          |
| Demonstrate age-related cultural competency                                      | All SonoSim Neonatal, OB/GYN, & Pediatric Courses                     | --                                         |
| Vital signs                                                                      | All SonoSim Advanced Clinical & Procedure Courses                     | All SonoSim Cases                          |
| Skin integrity                                                                   | Soft Tissue Core Clinical: Sonographic Anatomy, Sonographic Technique | Soft Tissue Core Clinical Cases            |
| Clinical history                                                                 | All SonoSim Core & Advanced Clinical Courses                          | All SonoSim Core & Advanced Clinical Cases |
| Proper patient positioning and draping                                           | All SonoSim Courses                                                   | All SonoSim Cases                          |
| IV insertion and injection with use of contrast-enhanced imaging                 | Fundamentals of Ultrasound: Basic Ultrasound Physics                  | --                                         |
| First aid and resuscitation techniques                                           | Resuscitative TEE                                                     | Resuscitative TEE Cases                    |
| Demonstrate knowledge of medical ethics and law: Informed consent                | Fundamentals of Ultrasound: Imaging Conventions                       | --                                         |
| Demonstrate knowledge of medical and sonographic terminology:                    |                                                                       |                                            |
| Definitions, abbreviations, symbols, terms, and phrases                          | All SonoSim Courses                                                   | All SonoSim Cases                          |
| Correlating diagnostic and imaging procedures                                    |                                                                       |                                            |
| Sonographic appearances                                                          |                                                                       |                                            |

| Curriculum Requirements                                                                                                                                                                                                                                                              | SonoSim Courses                                                                                                                                                                                                                                                                                                                                                                                          | SonoSimulator® Cases                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Obtain, evaluate, document, and communicate relevant information related to sonographic examinations:                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| Clinical information and historical facts from the patient and the medical records, which may impact the diagnostic examination including: clinical signs and symptoms, laboratory tests, imaging and diagnostic procedures, and oral and/or written summary of sonographic findings | All SonoSim Core Clinical, Advanced Clinical, & Procedure Courses                                                                                                                                                                                                                                                                                                                                        | All SonoSim Core Clinical, Advanced Clinical, & Procedure Cases                                                                                                                                                                                 |
| Deviation from practice parameters for the sonographic examination as required by patient history or initial findings                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| Identify and evaluate anatomic structures:                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| Sectional anatomy                                                                                                                                                                                                                                                                    | All SonoSim Courses                                                                                                                                                                                                                                                                                                                                                                                      | All SonoSim Cases                                                                                                                                                                                                                               |
| Relational anatomy                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| Normal sonographic appearances of organs, muscles, tissue, vascular and skeletal structures                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| Differentiation of normal from abnormal sonographic findings                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| Demonstrate knowledge of disease processes with application to sonographic and Doppler patterns:                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| Iatrogenic                                                                                                                                                                                                                                                                           | Airway Core Clinical: Sonographic Technique<br>Pulmonary Core Clinical: Case Studies: Pneumothorax Rule-Out, Cases Studies: Pneumothorax Rule-In<br>Pericardiocentesis, Paracentesis,& Thoracentesis: Complications<br>Peripheral Venous Access: Technical Tips & Pitfalls, Summary<br>US-Guided Femoral Line Placement, Internal Jugular Vein Cannulation, & Subclavian Vein Cannulation: Complications | Airway & Pulmonary Core Clinical Cases<br>Paracentesis, Pericardiocentesis, & Thoracentesis Cases<br>Peripheral Venous Access Cases<br>US-Guided Femoral Line Placement, Internal Jugular Vein Cannulation, & Subclavian Vein Cannulation Cases |
| Degenerative                                                                                                                                                                                                                                                                         | Aorta/IVC Core Clinical: Aortic Case Studies<br>Bladder Core Clinical: Case Pathologies                                                                                                                                                                                                                                                                                                                  | Aorta/IVC & Bladder Core Clinical Cases                                                                                                                                                                                                         |
| Inflammatory                                                                                                                                                                                                                                                                         | Intestinal/Biliary Core Clinical: Sonographic Technique, Case Studies<br>Musculoskeletal Core Clinical: Sonographic Technique, Case Studies<br>Soft Tissue Core Clinical: Sonographic Technique, Advanced Abscess Evaluation, Peritonsillar Abscess                                                                                                                                                      | Intestinal/Biliary, Musculoskeletal, & Soft Tissue Core Clinical Cases<br>SonoSim LiveScan® Hepatobiliary Scenarios                                                                                                                             |
| Traumatic                                                                                                                                                                                                                                                                            | Bladder Core Clinical: Case Pathologies<br>eFAST & FAST: All Lessons<br>Musculoskeletal Core Clinical: Tendon Evaluation, Shoulder Dislocation, Bone Evaluation<br>Ocular Core Clinical: Ocular Trauma<br>Pulmonary Core Clinical: Case Studies: Pneumothorax Rule-Out, Case Studies: Pneumothorax Rule-In<br>Soft Tissue Core Clinical: Foreign Bodies                                                  | Bladder, Musculoskeletal, Ocular, & Pulmonary Core Clinical Cases<br>eFAST & FAST Cases<br>SonoSim LiveScan® Trauma Care Scenarios                                                                                                              |
| Neoplastic                                                                                                                                                                                                                                                                           | Bladder Core Clinical: Case Pathologies<br>Renal Core Clinical: Case Studies                                                                                                                                                                                                                                                                                                                             | Bladder & Renal Core Clinical Cases<br>SonoSim LiveScan® Genitourinary Scenarios                                                                                                                                                                |

| Curriculum Requirements                                                                                                                                                                                                         | SonoSim Courses                                                                                                                                                                                                   | SonoSimulator® Cases                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Infectious                                                                                                                                                                                                                      | Bladder Core Clinical: Case Pathologies<br>Pulmonary Core Clinical: Case Studies: Alveolar Interstitial Syndrome                                                                                                  | Pulmonary Core Clinical Cases                                                                                                                                                                                                                                                                     |
| Obstructive                                                                                                                                                                                                                     | Bladder Core Clinical: Case Pathologies<br>DVT – Lower Extremity: All Lessons<br>Intestinal/Biliary Core Clinical: Sonographic Technique, Case Studies<br>Renal Core Clinical: Obstructive Uropathy, Case Studies | Bladder, Intestinal/Biliary, & Renal Core Clinical Cases<br>DVT – Lower Extremity Cases<br>SonoSim LiveScan® Hepatobiliary & Genitourinary Scenarios                                                                                                                                              |
| Congenital                                                                                                                                                                                                                      | Bladder Core Clinical: Case Pathologies                                                                                                                                                                           | --                                                                                                                                                                                                                                                                                                |
| Metabolic                                                                                                                                                                                                                       | Pancreas Anatomy & Physiology: Pancreas Physiology                                                                                                                                                                |                                                                                                                                                                                                                                                                                                   |
| Demonstrate knowledge and application of image production and optimization:                                                                                                                                                     |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| Sound production and propagation                                                                                                                                                                                                | Fundamentals of Ultrasound: Basic Ultrasound Physics                                                                                                                                                              | All SonoSim Cases                                                                                                                                                                                                                                                                                 |
| Interaction of sound and matter                                                                                                                                                                                                 |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| Instrument options and transducer selection                                                                                                                                                                                     | Fundamentals of Ultrasound: Transducer Basics, Imaging Conventions, Imaging Modes                                                                                                                                 |                                                                                                                                                                                                                                                                                                   |
| Principles of ultrasound instruments and modes of operation                                                                                                                                                                     |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| Operator control options                                                                                                                                                                                                        | Fundamentals of Ultrasound: Ultrasound System Operation                                                                                                                                                           |                                                                                                                                                                                                                                                                                                   |
| Physics of Doppler                                                                                                                                                                                                              | Fundamentals of Ultrasound: Doppler Mode Imaging                                                                                                                                                                  | Aorta/IVC, Lungs, & Upper Airway Anatomy & Physiology Cases<br>Aorta/IVC Core Clinial Cases<br>DVT – Lower Extremity Cases<br>RUSH Cases<br>All Advanced GYN, Advanced Cardiac, & Procedure Cases<br>SonoSim LiveScan® Critical Care & Genitourinary Scenarios<br>All DMS Vascular Protocol Cases |
| Principles of Doppler techniques                                                                                                                                                                                                |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| Methods of Doppler flow analysis                                                                                                                                                                                                |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                 |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| Hemodynamics of blood flow                                                                                                                                                                                                      | All SonoSim Vascular Courses                                                                                                                                                                                      | All SonoSim Vascular Cases                                                                                                                                                                                                                                                                        |
| Contrast-enhanced imaging                                                                                                                                                                                                       | Fundamentals of Ultrasound: Basic Ultrasound Physics                                                                                                                                                              | --                                                                                                                                                                                                                                                                                                |
| Acoustic artifacts                                                                                                                                                                                                              | Fundamentals of Ultrasound: Imaging Artifacts, Ultrasound System Operation                                                                                                                                        | All SonoSim Cases                                                                                                                                                                                                                                                                                 |
| Demonstrate knowledge and application of biological effects:                                                                                                                                                                    |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| In-vitro and in-vivo ultrasound effects                                                                                                                                                                                         | Fundamentals of Ultrasound: Infection Control & Biosafety                                                                                                                                                         | --                                                                                                                                                                                                                                                                                                |
| Exposure/equipment display indices                                                                                                                                                                                              |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| Generally accepted maximum safe exposure levels                                                                                                                                                                                 |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| ALARA principle (Mechanisms that affect the mechanical and thermal indices, techniques to decrease the mechanical and thermal indices)                                                                                          |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| Demonstrate achievement of clinical competency through the performance of the requirements to provide quality patient care and optimal examination outcome. Clinical competencies must include evaluation and documentation of: |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |
| Use of proper ergonomics                                                                                                                                                                                                        | All SonoSim Courses                                                                                                                                                                                               | All SonoSim Cases                                                                                                                                                                                                                                                                                 |
| Safety and infection control                                                                                                                                                                                                    | Fundamentals of Ultrasound: Infection Control & Biosafety                                                                                                                                                         | --                                                                                                                                                                                                                                                                                                |

| Curriculum Requirements                                       | SonoSim Courses                                                                   | SonoSimulator® Cases                                  |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------|
| Obtain clinical history and utilize information appropriately | <i>All SonoSim Core &amp; Advanced Clinical Courses</i>                           | <i>All SonoSim Core &amp; Advanced Clinical Cases</i> |
| Oral and written communication                                | <i>All SonoSim Courses</i>                                                        | <i>All SonoSim Cases</i>                              |
| Image optimization techniques                                 | <i>Fundamentals of Ultrasound: Imaging Artifacts, Ultrasound System Operation</i> |                                                       |
| ALARA                                                         | <i>Fundamentals of Ultrasound: Infection Control &amp; Biosafety</i>              | --                                                    |

*Not Covered:*

*Demonstrate knowledge and application of ergonomic techniques: Industry standards and OSHA guidelines; Types of work-related musculoskeletal disorders; Role of administration in the prevention of MSI; Role of sonographer in the prevention of MSI; Daily exercises in the workplace; Neutral posture; Patient transfer and assistance; Schedules/Workload; Workstation/work areas*

*Demonstrate knowledge and application of types and methods of infection control: Isolation procedures*

*Demonstrate knowledge and application of patient care: Patient care partnership; Demonstrate appropriate patient care in settings outside of the sonography department; Transport and transfer of patients with support equipment (Oxygen, Intravenous lines/pumps, Urinary catheters, Drainage tubes); Color; Comfort; Privacy; Basic pharmacology as related to the concentration; Post interventional procedure care and discharge; Reporting and documentation of incidents and/or adverse reactions; Life-threatening situations and implement emergency care as permitted by institutional policy, including the following: Pertinent patient care procedures, Principles of psychological support, Emergency conditions and procedures; Reporting and documentation of incidents and/or adverse reactions*

*Demonstrate knowledge of the roles and responsibilities of healthcare professions to effectively communicate and collaborate in the healthcare environment: Team development; Conflict resolution; Interprofessional communication and education*

*Demonstrate knowledge of medical ethics and law: Patient's right to privacy based on applicable legal and regulatory standards; HIPAA; Electronic documentation and transmission; Terminology related to ethics, values, and morals; Types of law; Risk management; Medical malpractice liability coverage; Documentation of clinical incidents; Professional scope of practice and clinical standards; Professional code of ethics*

*Obtain, evaluate, document, and communicate relevant information related to sonographic examinations: Changes from a previous examination; Examination findings that require an immediate clinical response and notify the interpreting physician*

*Demonstrate knowledge of disease processes with application to sonographic and Doppler patterns: Immunologic*

*Demonstrate knowledge and application of image production and optimization: Emerging technologies; Image storage devices*

*Demonstrate knowledge of a quality control and improvement program: Lab accreditation; Credentialing organizations; Equipment operation and maintenance (phantom testing, records maintenance)*

*Demonstrate awareness of resources for professional development: Professional organizations and resources; Professional journals and on-line resources; Continuing education conferences; Clinical conferences, lectures, and in-house educational offerings; Recent developments in sonography; Research statistics and design*

*Demonstrate achievement of clinical competency through the performance of the requirements to provide quality patient care and optimal examination outcome. Clinical competencies must include evaluation and documentation of: Professionalism; Document sonographic findings for communication with interpreting physician; Finalize examination for permanent storage; Process for reporting of clinical findings*