

Principles of Servicing Ultrasound Systems (eLearning: 2.5 Days)



RADIOLOGICAL SERVICE TRAINING INSTITUTE

Introduction

This course covers the principles of ultrasound with specific focus on maintenance.

Prerequisites

To attend this course, the service professional must possess fundamental knowledge and understanding of basic electronics.

Objectives

At the completion of this course, participants will be able to:

- Demonstrate an understanding of the physics of sound
- Demonstrate an understanding of basic ultrasound theory
- Identify the characteristics of acoustic waves
- Identify various modes of operation
- Describe the parts of a basic ultrasound scanner
- Identify signal flow and label system block diagrams
- Understand image quality as it pertains to ultrasound
- Perform QA checks
- Perform PM checks on various ultrasound machines
- Perform networking and DICOM setup
- Identify probes and their uses

Course Outline

Day 1

- Introduction to ultrasound
 - Overview of ultrasound in medicine
 - History
- Physics of sound
 - Sound
 - Wave Propagation
 - Doppler Effect
 - Piezoelectric Effect
- Interactions with Tissues
 - Reflection
 - Refraction
 - Scattering
 - Absorption
 - Diffraction
- Transducers
 - Evolution of Transducers
 - Types of Transducers
 - Image Formats
 - Construction
 - Beam Formation
- Modes of operation
 - 2D-mode
 - 3D-mode
 - 4D-mode
 - M-mode
 - Doppler
 - Color
 - Spectral

Day 2

- Clinical Applications
 - Radiology
 - Cardiology

- Vascular
- OB/GYN
- Basic ultrasound scanner and controls
 - System block diagram
 - Beam former
 - Transmitter
 - Receiver
 - Scan conversion
 - Output
 - Power
 - Basic scanning of the body
- Image Quality
 - Axial resolution
 - Lateral resolution
 - Dynamic range
 - Sensitivity
 - SNR
- Ultrasound connectivity
 - Networking configuration
 - PACS & DICOM configuration
 - DICOM/Output verification
 - Ultrasound connectivity troubleshooting

Day 3

- Required Tools
- Basic PM Procedures
 - Basic ACR Procedures
 - Probe maintenance
 - Probe handling
 - Probe cleaning
 - Probe disinfecting
 - Software Requirements
- Common Probe Failures
- Basic Ultrasound Troubleshooting