Hands-On Training Course

ACR Accreditation and Servicing the LORAD MIV Platinum

Course Length: 2 Weeks
CEUs Awarded: 8

Introduction

Mammography may be the most dynamic of all of today's imaging modalities. With the new regulatory and accreditation procedures, and advancements in technology, the service professional is becoming more involved in maintaining the quality of the mammographic images produced. This course is designed to give the service professional the insight to evaluate image quality problems, determine if the mammographic unit is the source of the image problem and take the appropriate steps to correct the deficiency. Given today's regulatory environment, maintaining the system at peak performance is of the utmost importance.

Objectives

- Describe the current mammographic imaging regulatory environment
- Describe the factors that affect mammographic image quality
- Describe how those factors are optimized to produce the highest quality mammographic images
- Describe the basic components of the LORAD MIV Platinum mammographic units
- Describe the function of the basic components of the LORAD MIV Platinum mammographic unit
- Demonstrate an understanding of the accreditation process
- Demonstrate an understanding of the Mammographic Quality Standards Act
- Demonstrate an understanding of the installation procedures associated with the MIV Platinum
- Perform the necessary mammographic performance monitoring and quality assurance procedures utilizing the LORAD MIV Platinum
- Perform the necessary tests to reproduce the results of the physicist's report to confirm corrective action
- Perform all system calibrations and adjustments to maintain the highest quality images and compliance with MQSA requirements
- Evaluate circuit functions to facilitate troubleshooting

Prerequisites

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

Course Outline

DAY 1

I. Mammography process overview
II. Basic terminology
III. Positioning and technique
IV. Screening vs clinical

Lab Activities

I. Dark room conditions
II. Sensitometric properties
III. Photographic density
IV. Characteristic curves
V. Screen considerations
VI. Processing

DAY 2

I. Factors affecting image quality
II. ACR Mammography Accreditation Program
III. Quality assurance in mammography

Lab Activities

I. Collimation
II. Compression devices
III. Bucky/grid devices
IV. AEC tracking
V. Focal spot geometry
VI. Phantom images

DAY 3

I. Troubleshooting image quality problems
II. Mammography quality control, beyond the basic
III. 1999 Mammography Quality Standards Act (MQSA)

Lab Activities

I. kVp
II. HVL
III. Linearity
IV. Reproducibility
V. Glandular dose
VI. Radiation safety

DAY 4

I. Introduction to the LORAD MIV Platinum system
II. System specifications
III. Site planning and installation
IV. Operation
V. Knobology
VI. Physical layout
VII. Using LORAD documentation

Lab Activities

I. Component location
  A. Schematic location
  B. Physical location
  C. Connector locations
  D. Fuse location/identification
II. Cover removal procedures
III. Locating ID/Compliance labels
IV. Parts identification

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DAY 5

I. Turn-on circuits
II. Power distribution
  A. AC supplies/distribution
  B. DC supplies/distributionI.
III. System block diagrams

Lab Activities

I. Input AC voltage adaptation
II. Power supply verification
  A. AC supplies
  B. DC supplies

DAY 6

I. kV control
  A. Manual kV
  B. Auto kV
II. HV secondary
  A. Feedback circuits
  B. Safety circuits
  C. Overload detect
III. mA control
  A. @Manual kV
  B. @Auto kV
IV. Filament drive circuits
  A. Filament control
  B. Filament protect
  C. Grid bias

Lab Activities

I. kV measurement
  A. Invasive
  B. Non-invasive
II. Safety/Overload circuits
III. Waveform analysis
IV. kV Calibration
  A. Manual kV
  B. Auto kV
V. mA/mAS measurement
VI. Filament drive waveform analysis
VII. mA waveform analysis
VIII. mA calibration
  A. @Manual kV
  B. @Auto kV
  C. Grid bias calibration

DAY 7

I. Rotor control
  A. Inverter drive
  B. Rotor status checks
II. Exposure control
  A. Manual
  B. AEC
    1. AEC detect
    2. Auto time
    3. Auto kV
    4. Auto filter
III. Patient data system
IV. Monitor

Lab Activities

I. AEC calibrations
  A. Optical density
  B. Thickness compensation
  C. HTC compensation
  D. grid compensation
  E. kV tracking
II. Rotor control programming
III. Rotor verification
IV. Rotor waveform analysis

DAY 8

I. Electromechanical systems
  A. Tube support area
  B. Gantry drive area
  C. Film support area

Lab Activities

I. Auto-filter threshold
II. Compression force calibration
III. Filter calibration
IV. Rotation zero calibration
V. Rotation velocity calibration
VI. Vertical velocity calibration
VII. Stereoloc rotation velocity calibration
VIII. HTC thickness threshold

DAY 9

I. Stereoloc
  A. Motor drive
  B. Camera interface
  C. Angle drive
  D. System interface
  E. Feedback
II. Accessory interfacing
III. Tube replacement
IV. Mechanical adjustments

Lab Activities

I. Accessory interface verification
II. Tube type programming
III. Collimator calibration
IV. Mirror calibration
V. System troubleshooting

DAY 10

I. Course review
II. Course evaluation
III. Final exam