Hands-On Training Course

MULTI-VENDOR MAMMOGRAPHY:

Course Length: 2 Weeks
CEUs Awarded: 8 CEUs

GE DMR+, 800T, LORAD MIV PLATINUM™, & SIEMENS MAMMOMAT 3000 NOVA

Introduction

Mammography may be the most dynamic of all of today's imaging modalities. With the strict regulatory environment, accreditation procedures, and advancements in technology, the service professional is becoming more involved in maintaining multiple vendor's mammographic systems. This course is going to cover the Laws, Regulations, Calibration, Service, Troubleshooting & QA of multiple vendor's mammographic equipment. Given today's regulatory environment, maintaining the system at peak performance is of the utmost importance. Please check the schedule for equipment used.

Prerequisites

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

Objectives

Upon completion of this course the student will be able to:

- Describe the current mammographic imaging regulatory environment
- Describe the factors that affect mammographic image quality
- Demonstrate an understanding of the accreditation process
- Describe how those factors are optimized to produce the highest quality mammographic images
- Demonstrate an understanding of the Mammographic Quality Standards Act

Given various manufacturer's systems be able to:

- Demonstrate an understanding of calibration procedures associated with various mammo equipment
- 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

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 systems

II. System specifications

III. Operation

IV. System controls

V. Physical layout

VI. Using documentation

VII. Using software

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

DAY 5

I. Turn-on circuits

II. Power distribution

III. System block diagrams

MULTI-VENDOR MAMMOGRAPHY:

GE DMR+, 800T, LORAD MIV PLATINUM™, & SIEMENS MAMMOMAT 3000 NOVA CONTINUED

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

Lab Activities cont'd

I. mA/mAS measurement

II. Filament drive waveform analysis

III. mA waveform analysis

IV. mA/tube heater 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

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

F. Photocell

II. Rotor control

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. Thickness calibration

II. Compression force calibration

III. Filter calibration

IV. Rotation zero calibration

V. Grid calibration

VI. Collimator calibration

VII. Stereoloc rotation velocity calibration

VIII. HTC™ thickness threshold

DAY 9

I. Accessory interfacing

II. Tube replacement

III. 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