

Principles of Diagnostic Imaging for Managers and Sales Professionals Course

Course length: 3 Days
CEU's Awarded: 2

COURSE INTRODUCTION

This three-day course is specifically designed to provide managers and sales professionals with the requisite knowledge for a full understanding of the principles and concepts of diagnostic imaging. This in-depth course covers from how x-rays are produced to the advanced imaging chain.

DAY 1

- I. Basic radiographic physics
 - A. History and advances in imaging
 - B. The electromagnetic spectrum
 - C. X-ray production
 1. Bremsstrahlung radiation
 2. Characteristic radiation
 3. X-ray beam characteristics
 - D. Properties of x-rays
 1. Ionization
 2. Photoelectric effect
 3. Compton effect
- II. Basic radiographic system overview
 - A. Production of x-rays
 1. The x-ray tube
 2. The high voltage transformer
 3. The high voltage cables
 4. The x-ray control
 - B. The formation of the x-ray image
 1. Focal spot
 2. Filtration
 3. Collimation
 4. Patient
 5. Grid
 - C. Film, screens, and processing
- III. Image quality terminology
 - A. Density
 - B. Contrast
 - C. Sharpness
 - D. Detail visibility
 - E. Resolution
- IV. Factors affecting radiographic image quality
 - A. X-ray beam production
 - B. Geometry
 - C. Collimation
 - D. Patient
 - E. Contrast media
 - F. Film, screens, and processing
- V. Introduction to diagnostic imaging systems
 - A. The overtable system
 - B. The undertable system
 - C. The Tomographic system

COURSE OBJECTIVES

At the conclusion of this course, attendees will be able to:

- Understand radiation safety relating to patient, operators, physicians, and others.
- Understand how x-rays are produced and controlled.
- Define the factors which affect radiographic quality.
- Describe the parameters of films, screens and processing.
- Describe the operation of radiographic, fluoroscopic and special systems.
- Describe common contrast media and non contrast media RF studies.

- D. The Cine system
- E. Computed Tomography

DAY 2

- I. Common radiographic and fluoroscopic studies
 - A. Study terminology
 - B. Patient positioning
 - C. X-ray tube positioning
- II. Radiation safety
 - A. Radiation physics
 - B. Radiation measurement
 - C. Methods of reducing patient and occupational exposure
- III. X-ray production and control
 - A. The x-ray tube
 1. Operation
 2. Construction
 3. Installation
 4. Evaluation
 5. Tube rating charts
 6. X-ray tube selection
 - B. High voltage cables and terminations
 1. Construction
 2. Common cable problems
- IV. Single phase power fundamentals
- V. Three phase power fundamentals
 - A. Wye and Delta connections
 - B. Six pulse configuration
 - C. Twelve pulse configuration
- VI. The x-ray control
 - A. KV control circuits
 - B. mA control circuits
 - C. Time control circuits
 - D. Control logic circuits
 - E. Tube protector circuits
- VII. Aerial image formation
 - A. Photoelectric effect

WHO SHOULD ATTEND

- Administrators and managers of:
 - Hospitals
 - Radiology Departments
 - Clinical Engineering
 - Biomedical Engineering
- Radiology sales professionals
- Radiology technologists
- Personnel developing an in-house or shared services diagnostic imaging service program

- B. Compton effect
- C. Beam quality
- D. Beam limiting devices
- E. Grids

DAY 3

- I. Intensifying screens
 - A. Types
 - B. Effects on image quality
 - C. Screen selection
 - D. Care and maintenance
- II. X-ray film
 - A. Construction and types
 - B. Sensitometric properties
 - C. Hurter and Driffield Curves
- III. Technique charts use and evaluation
 - A. Fixed Kv
 - B. Fixed mAs
 - C. Inverse Square Law
- IV. X-ray film processing
 - A. The processing cycle
 - B. Processor evaluation
 - C. Effects on image quality
- V. Introduction to fluoroscopic imaging
 - A. Image intensifiers
 - B. Optics
 - C. TV cameras
- VI. Circle of Quality Assurance
 - A. Acceptance Testing
 - B. Performance Evaluation
 - C. CDRH Compliance Testing
 - D. Image Quality Assurance
 - E. Preventive Maintenance
 - F. Service Programs
 - G. Continuing Education
- VII. Managing a Diagnostic Imaging Maintenance Program
 - A. Maintenance Options
 - B. Parts Sourcing
 - C. Training Options
 - D. Test Equipment
 - E. Program Support
- VIII. Course evaluation