

**Reading Hospital School of Health Sciences
Medical Imaging Program**



MI123: Clinical Seminar I
Basic X-ray Room Orientation

Equipment (Energized)

- Equipment malfunction -- Emergency electrical breakers
 - Who do you report a malfunction to?
- Radiation protection items

Miscellaneous

- X-ray tube
 - Anode (+)
 - Cathode (-)
- Fluoroscopic imaging
 - Functional, live imaging vs Anatomical, still imaging
 - Fluoro carriage/tower
- Image intensifier
 - Fluoro –image receptor

Tube controls

- Raise and lower the x-ray tube by using the vertical lock
- Move the x-ray tube the length of the table using the longitudinal lock
- Move the x-ray tube the width of the table using the transverse lock
- Place 14 x 17, 10 x 12, and 8 x 10 free detector/CR cassette in the table bucky lengthwise and/or crosswise
 - Positive Beam Limitation (PBL)
 - Bucky Tray vs. Digital Detector
- Locate the laser light
- Center the perpendicular central ray to the table image receptor
- Lock the x-ray tube to the center of the table transversely
- Employ requested distances to the table image receptor by using the proper SID indicators
- Rotate the tube head and maintain proper centering of the free detector/CR cassette
- Angle the tube cephalad and/or caudad any given degree
- Center the angled central ray to the table image receptor
- Employ requested distance to the table by using the tape measure
- Collimate to appropriate field size
- Align a designated area to the center of the image receptor by moving the table
 - Table – Motor driven

Upright/Erect Image Receptor

- Center the central ray to the upright image receptor
- Employ requested distances to the upright image receptor by using the proper SID indicators
- Adjust the height of the upright image receptor
- Rotate the upright image receptor into a horizontal position
- Attach and detach arm attachment to the upright image receptor
- Place 14 x 17, 10 x 12 and 8 x 10 free detector/CR cassette in the erect bucky tray lengthwise and/or crosswise
- Align the central ray, body part and the upright image receptor while maintaining longitudinal and transverse detents.

Ancillary Equipment

- Footboard
- Shoulder supports
- Handgrips
- Compression bands – Velcro straps (do not have in lab but could see at other facilities)
- Markers
- Grids
- Calipers

Control console

- Technologist selects the exposure factors required to produce the image after consulting a technique chart
 - Exposure Switch
 - On/Off
 - Select correct procedure on console
 - ID the technique book
 - mA, s, mAs – Milliampere, Seconds
 - kVp-Kilovolt (peak)-Controls the energy and penetrating ability of the beam
 - Turn AEC on/off (Automatic Exposure Control)
 - Density Setting
 - Photocells
 - Patient size

Equipment (Non-Energized)

Terminology

- Automatic Exposure Control (AEC)
- Ionization chambers-detects and measures the radiation intensity
 - photodiode
- Grids

Table

- Floating (non-energized)
- Manually driven (energized)

Tube controls

- Raise and lower the x-ray tube by using the vertical lock
- Move the x-ray tube the length of the table using the longitudinal lock
- Move the x-ray tube the width of the table using the transverse lock
- Locate the laser light

- Center the perpendicular central ray to the table image receptor
- Lock the x-ray tube to the center of the table transversely
- Employ requested distances to the table image receptor by using the proper SID indicator
- Collimate 14 x 17, 10 x 12, and/or 8 x 10 to the table image receptor lengthwise and/or crosswise
- Rotate the tube head and maintain proper centering of the free detector/CR cassette
- Angle the tube cephalad and/or caudad any give degree
- Center the angled central ray to the table image receptor
- Employ requested distance to a free detector/CR cassette by using the tape measure
- Collimate to appropriate field size
- Align a designated area to the center of the image receptor by moving the table
- Lock the table position for patient safety

Upright/Erect Image Receptor

- Center the central ray to the upright image receptor
- Employ requested distances to the upright image receptor by using the proper SID indicator
- Adjust the height of the upright image receptor
- Rotate the upright image receptor into a horizontal position
- Attach and detach arm attachment to the upright image receptor
- Align the central ray, body part and the upright image receptor while maintaining longitudinal and transverse detents.

Control console

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- Exposure Index