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# ***INTRODUCTORY RADIOGRAPHIC TECHNIQUE***

## S Y L L A B U S

### **A. Status of paraprofessionals performing radiographic procedures**

1. Legislation
2. Credentialing
3. State regulations

### **B. Healthcare Terminology**

### **C. Anatomy**

1. Skeletal anatomy
2. Brief survey of joint anatomy/physiology

### **D. History**

### **E. Nature of radiation**

1. Electromagnetic spectrum
2. Fundamental properties of x-ray
3. Ionizing vs non-ionizing
4. Production of x-ray
  - a. tube - basic structure
  - b. generator - control panel
  - c. transformer
5. Image formation
  - a. what actually occurs to produce a radiograph  
"black or lack of black"
  - b. selective absorption
    - 1) energy of rays
    - 2) density of material
    - 3) thickness of material
  - c. tube filtration
  - d. mAs
  - e. primary radiation, remnant radiation, unnecessary radiation (scatter, secondary, leakage)
  - f. radiopaque/radiolucent
  - g. central ray, source-to-image distance, object-to-film distance

## **F. Film and Cassettes**

1. Film
2. Cassettes
3. Intensifying screens
  - a. use
  - b. life span
  - c. cleaning
4. Storage of loaded cassettes
5. Film identification

## **G. Film processing**

1. the darkroom
2. safelight
3. film handling basics
4. the processor
5. developer and fixer
6. what you have to do
7. artifacts
8. processor maintenance

## **H. Improving the Image**

1. Heel Effect
2. Collimation
  - a. purposes
  - b. accuracy
2. Compensating filtration
3. Grids
  - a. lines per inch (reciprocating bucky or fine line stationary grid in grid cabinet)
  - c. grid ratio
  - d. focal range

## **I. Four main components of radiographic quality**

1. Radiographic density (lightness/darkness of film)
  - a. controlled largely by mAs
  - b. constant optimum kV technique, varying the mAs according to patient size
2. Scale of contrast (shades of gray)
  - a. controlled by "teeter-totter" relationship of mAs to kV
  - b. values of appropriate gray-scale technique
3. Radiographic Definition (clarity/detail of the image)  
motion, screen speed, film speed, film quality, film/screen contact, grids, collimation, OFD/SID, focal spot size, light fog, chemical fog
4. Distortion (image not accurately representing the anatomy)
  - a. patient placement
  - b. level of central ray
  - c. tube angle
  - d. conforming tube angle to the anatomy

## **J. Radiographic equipment and accessories**

## **K. Radiation Safety**

1. Tissue radiosensitivity
  - a. radiography of the pregnant female and children
2. Shielding
3. Safety procedures: collimation, filtration, shielding, high-speed screens, barriers, conscientious technique
4. Units of measurement - R, r, rem

5. Dose limits
6. Personnel dosimetry
7. Notices required for posting
8. Inspection by X-ray Control, Department of Health

**L. Ethics and etiquette**

1. Film handling
2. Film marking
3. Film exchange
4. X-ray release
5. Film retention
6. Regulations

**M. Technique formulation**

1. Guidelines for formulation of a technique chart (high-standardized-optimum kV chart)
2. Optimum kV ranges
3. How to use a *Supertech*®
4. Example technique chart
5. Logging

**N. Patient Positioning**

1. Spine
  - a. cervical
  - b. thoracic
  - c. lumbar
  - d. sacrum, coccyx
  - e. full spine (AP only; lateral "sectionals" should accompany the APFS)
2. Extremities (shoulder, elbow, wrist, hand, hip, knee, ankle, foot)
3. Chest/Ribs
4. Skull, sinuses
5. Brief description of other imaging systems

**O. Quality critique**

1. Organized format
2. Most common errors in the production of good radiographic studies
3. Technical problems which inhibit accurate radiologic diagnosis
4. Visualization of "duds" to determine "what went wrong"

**P. Patient management**

1. "Start-to-finish" outline
2. Common questions raised by patients

**Q. Evaluation**

1. Review of important points
2. Projects to accomplish **before** 2nd class (homework re learning about in-office equipment)
3. Projects to accomplish **before** 3rd class
4. Operator competence
5. Discussion on professional attitudes and image