SNS COLLEGE OF ALLIED HEALTH SCIENCES

SNS Kalvi Nagar, Coimbatore-35

Affiliated to The Dr.M.G.R Medical University, Chennai

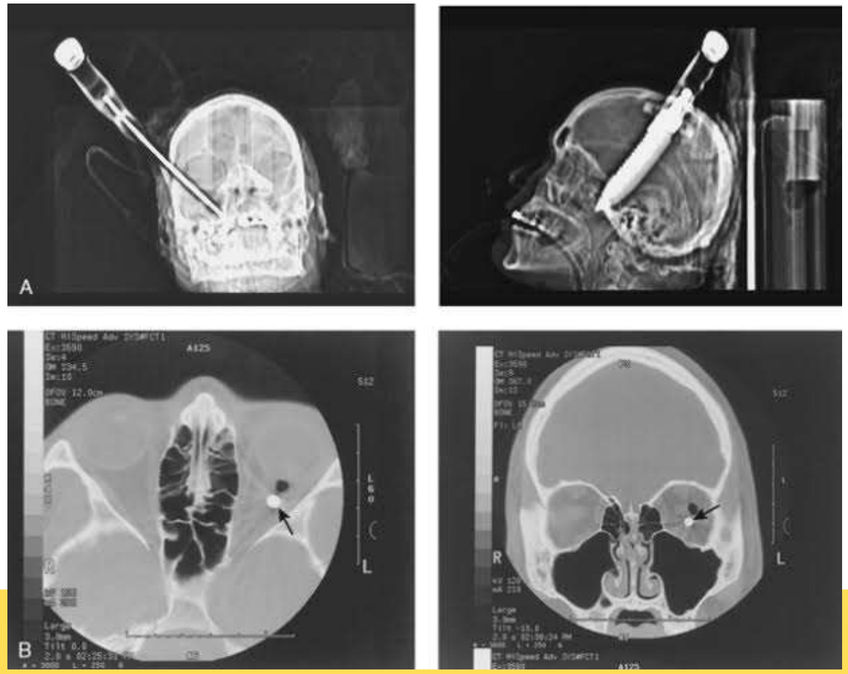
RADIOGRAPHY AND IMAGING TECHNOLOGY - II YEAR

COURSE NAME : CONTRAST & SPECIAL RADIOGRAPHY PROCEDURES

TOPIC : TRAUMA AND OPERATION THEATRE RADIOGRAPHY

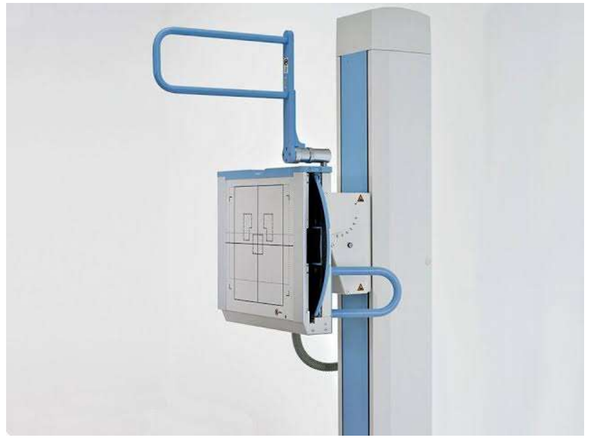
Trauma Radiography

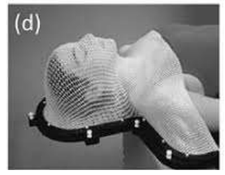
- Trauma/Emergency radiography involves imaging patients with sudden or accidental injuries.
- These injuries may range from minor to life-threatening.
- Radiographers play a vital role in capturing high-quality diagnostic images using mobile units and C-arms.

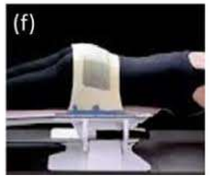


Essential Equipment & Setup

- Trauma X-ray rooms should have:
  - Vertical bucky
  - Sliding tabletop with bucky
  - Grids and adjustable X-ray tubes
  - Immobilization devices (sponges, sandbags, etc.)
  - Emergency apparatus
- Mobile X-ray units and C-arms are essential for trauma imaging.
- Communication with emergency staff is crucial for a smooth workflow.







Positioning & Imaging Techniques

- Always minimize patient movement; adjust the X-ray tube instead.
- If the patient is unconscious, use:
  - Horizontal X-ray beam for lateral projections.
  - Vertical grid for minimizing movement artifacts.
- Increase kVp and reduce mAs to decrease motion blur.
- Use shortest possible exposure time to obtain a clear image.

Case Study: Road Traffic Accident (RTA)

Scenario: A 25-year-old male is brought in after a motorbike accident with suspected fractures.

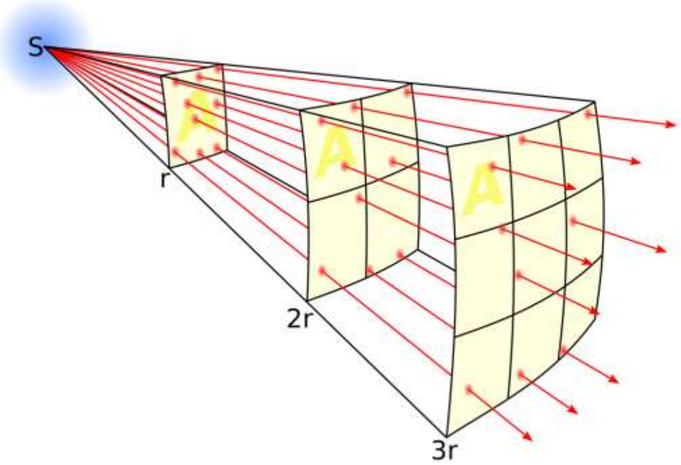
• AP and lateral views of the affected limb are taken.

• A C-arm is used in the ER for quick fracture assessment.

• Radiographer ensures ALARA principles to reduce radiation exposure.

Radiation Protection in Trauma Radiography

- Use collimation to focus the beam and reduce scatter radiation.
- Ensure all staff wear lead aprons and protective gear.
- Follow ALARA principles: minimize exposure time, maximize distance, and use shielding.
- Apply the inverse square law to reduce dose to staff and patients.



Operation Theatre Radiography

- OT radiography provides real-time imaging assistance for surgeons.
- It is widely used in orthopedic, general, neuro, and urology surgeries.

Equipment used:

1. Mobile X-ray units
2. C-arms
3. Digital image intensifiers

General Guidelines

- Communicate with OT staff and prepare the necessary equipment

- Clean mobile X-ray units and cassettes with antiseptic before and after use.

- Use sterile plastic covers for cassettes to maintain hygiene.

- Wear OT attire: gowns, gloves, masks, and caps to prevent contamination.

- Maintain a sterile field by avoiding contact with sterile areas

Real-time Imaging in OT

- C-arms provide live imaging to guide surgical procedures.
- Common procedures include:
  - Hip dislocation reduction
  - Fracture fixation
  - Stone extraction and urology procedures
- The radiographer must capture images at key moments for surgeon assessment.

Case Study: ORIF Surgery

Scenario: A 60-year-old female undergoes an Open Reduction Internal Fixation (ORIF) for a femur fracture.

- The C-arm is positioned for lateral and AP views.
- Surgeon adjusts screws while referring to live X-ray images.
- Radiographer ensures proper alignment before final fixation.

Radiation Protection in OT Radiography

. • Follow ALARA principles: minimize exposure time, maximize distance, and use shielding.

• Maintain at least 2m distance from the X-ray tube.

• Use lead aprons (0.25mm Pb equivalent) and lead gloves.

• Stand at a right angle to the radiation source to reduce exposure.

• High-speed screens should be used to reduce exposure time.

• Pregnant women and minors should not be in the OT during exposure.