

Most Important Past Paper Questions!

How to expose cervical vertebrae? Give detail.

Techniques and Positioning for Exposing Cervical Vertebrae

1. Patient Preparation

- **Gowning:** Ensure the patient wears a gown, removing any jewelry, glasses, or metal objects around the neck and upper chest area to prevent artifacts in the X-ray image.
- **Explanation:** Explain the procedure to the patient to ensure cooperation, as maintaining the correct posture and stillness is crucial for a successful exposure.

2. Cassette Size and SID

- **Cassette Size:** Use an 18 x 24 cm or 24 x 30 cm cassette, depending on patient size.
- **SID (Source-to-Image Distance):** 150-180 cm for lateral views to reduce magnification; 100 cm for AP and oblique views.

3. Projections and Positioning

- **Anteroposterior (AP) View:**

- **Patient Position:** (Upright or supine, facing the X-ray tube with chin slightly elevated)

Position the patient upright or supine with their back against the image receptor (IR). Align the mid-sagittal plane (MSP) of the head and neck with the IR to prevent rotation. Elevate the chin slightly so the mandible doesn't obscure the upper cervical vertebrae.

- **Centering:** At C4 (Adam's apple level).
- **kVp/mAs:** 70-75 kVp, 8-10 mAs.
- **Breathing:** Ask the patient to hold their breath.

- **Lateral View:**

- **Patient Position:** (Upright, with the side of the neck against the IR, shoulders relaxed)

Place the patient in an upright position with one shoulder touching the IR. The head should face forward, ensuring the MSP is parallel to the IR. Ask the patient to relax their shoulders, and if necessary, provide light weights for each hand to further depress the shoulders and prevent them from obscuring the lower cervical vertebrae.

- **Centering:** At C4.
- **kVp/mAs:** 75-80 kVp, 12-16 mAs.
- **SID:** 150-180 cm.
- **Breathing:** Suspend after full exhalation to depress shoulders.

- **Oblique View (AP or PA):**

- **Patient Position:** (Rotate the patient 45° with head turned towards the IR for AP oblique.)

Rotate the patient 45° from the IR to achieve an oblique view. For AP oblique, the back should be toward the IR; for PA oblique, the chest should be toward the IR. Adjust the head so it is turned slightly towards the IR to align the cervical spine with the angle of the body.

- **Central Ray:** 15-20° cephalad for AP oblique, caudad for PA oblique.
- **Centering:** At C4.
- **kVp/mAs:** 70-75 kVp, 10-12 mAs.
- **SID:** 100 cm.
- **Breathing:** Hold breath.

- **Odontoid (Open Mouth) View:**

- **Patient Position:** (Patient's mouth open, chin slightly elevated.)

Position the patient upright or supine with the mouth open as wide as possible. Align the head so that the lower edge of the upper incisors is parallel to the mastoid tip to avoid superimposition over C1-C2.

- **Centering:** Through open mouth, aiming at C1-C2.
- **kVp/mAs:** 70 kVp, 8-10 mAs.

3. Radiation Protection

- **Lead Shielding:** Use thyroid and gonadal shields.

Write down the procedure to take X-ray of ribs?

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To take an X-ray of the ribs, specific positioning, projections, centering, and technical parameters like SID, cassette size, kVp, and mAs are essential to obtain clear diagnostic images. Here's a detailed answer that includes these elements.

Rib X-ray Procedure

1. Patient Preparation

- **Gowning:** Have the patient wear a gown and remove any jewelry, clothing with buttons, or metallic objects around the chest area to avoid artifacts.
- **Explanation:** Explain the procedure to help the patient stay still and relaxed during the exposure, as movement may blur the image.

2. Cassette Size and SID

- **Cassette Size:** Use a **35 x 43 cm** cassette for full rib exposure, covering the entire chest area.
- **SID (Source-to-Image Distance):** Typically, an SID of **72 cm** is used for rib imaging, which is standard to maintain image quality.

3. Projections and Positioning

- Ribs require **AP (Anterior-Posterior) or PA (Posterior-Anterior) projections, Oblique projections**, and adjustments based on whether the focus is on the upper or lower ribs.

Upper Ribs (Above Diaphragm) - AP or PA Projection

- **Positioning:** For AP projection, position the patient upright (standing or sitting) with their back against the image receptor (IR). For PA projection, position the patient facing the IR. Elevate the chin to keep it out of the field of view.
- **Arm Position:** Have the patient rest their arms at their sides or place hands on hips to rotate the scapulae out of the way.
- **Centering:** Align the central ray perpendicular to T7 (3-4 inches below the jugular notch).
- **SID:** 100 cm.
- **Breathing:** Instruct the patient to take a deep breath and hold it, expanding the chest to raise the ribs.
- **kVp/mAs:** Use **65-75 kVp** and **10-12 mAs** for optimal contrast in visualizing bone detail.

Lower Ribs (Below Diaphragm) - AP Projection

- **Positioning:** Position the patient supine to allow the diaphragm to move upward, providing a better view of the lower ribs.
- **Centering:** Center the ray perpendicular to the IR at the level of T10 (lower costal margin).
- **SID:** 100 cm.
- **Breathing:** Have the patient exhale fully and hold their breath to elevate the diaphragm.
- **kVp/mAs:** Use **75-85 kVp** and **20-25 mAs** to penetrate the thicker abdominal area.

Oblique Projection (45° Oblique)

- **Purpose:** To visualize the axillary portion of the ribs.
- **Positioning:** Rotate the patient 45° toward the affected side for an AP oblique (posterior ribs) or away from the affected side for a PA oblique (anterior ribs).
- **Arm Position:** Raise the arm on the affected side and rest it on the head; place the opposite hand on the hip.

- **Centering:** For upper ribs, center the ray to T7; for lower ribs, center to T10.
- **SID:** 100 cm.
- **Breathing:** Instruct the patient to take a deep breath and hold it for upper ribs or exhale for lower ribs.
- **kVp/mAs:** Use **70-80 kVp** and **12-15 mAs**.

4. Radiation Protection

- **Lead Shielding:** Use lead shielding over the patient's lower abdomen or gonadal area to protect from radiation.

5. Image Quality Check

- Ensure that images cover the entire area of interest (upper or lower ribs) with clear bone detail and contrast.
 - Review that there is no patient rotation and that both AP/PA and oblique views provide comprehensive visualization of the ribcage.
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