

Introduction to Radiographic Positioning

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Fundamental concepts for producing accurate, diagnostic-quality X-ray images

1. Why Positioning Matters

- **Image Quality** – Proper positioning reduces distortion, superimposition, and motion blur.
 - **Diagnostic Value** – Correct anatomy is displayed in the intended projection, allowing reliable interpretation.
 - **Radiation Safety** – Accurate placement minimizes repeat exposures and keeps dose “as low as reasonably achievable” (ALARA).
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2. Basic Terminology

Term	Definition
Projection	The direction of the X-ray beam relative to the patient (e.g., AP, PA, lateral).
Central Ray (CR)	The imaginary line that passes through the central point of the X-ray field and the X-ray tube focal spot.
Anatomical Landmarks	Bony or soft-tissue structures used to align the patient (e.g., sternal notch, iliac crest).
Beam Center	The point on the image receptor where the CR intersects the receptor.
Source-to-Image Distance (SID)	Distance from the X-ray tube focal spot to the image receptor (commonly 40-100 cm).
Collimation	Restricting the X-ray beam to the area of interest to reduce scatter and dose.

3. General Positioning Principles

1. **Identify the Target Anatomy** – Know the clinical question and the structure to be visualized.

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2. **Select the Appropriate Projection** – Choose AP, PA, lateral, oblique, etc., based on anatomy and pathology.
 3. **Align Patient Using Landmarks** – Position the patient so that the central ray passes through the predefined anatomical point.
 4. **Center the Beam** – Ensure the CR strikes the image receptor at the intended location.
 5. **Verify SID and Collimation** – Set the correct distance and limit the field to the region of interest.
 6. **Check Patient Comfort & Stability** – Use supports, cushions, and clear instructions to reduce motion.
 7. **Confirm Exposure Settings** – Adjust kVp, mA, and time according to body part thickness and SID.
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4. Common Projections & Positioning Steps

4.1 Chest – PA (Posterior?Anterior)

Step	Action
1	Patient stands upright, back against the detector, shoulders rolled forward 10?15°.
2	Feet shoulder?width apart; chin raised, looking upward.
3	Central ray: 10?cm behind the mid?sternum (approximately at the level of the 4th intercostal space).
4	SID: 180?cm (standard for chest PA).
5	Collimate from lung apices to costophrenic angles.

4.2 Abdomen – AP Supine

Step	Action
1	Patient lies supine on the table, arms at sides, knees slightly flexed.
2	Center the detector under the abdomen; align mid?line with the umbilicus.
3	Central ray: 1?cm below the umbilicus (mid?line).
4	SID: 100?cm (or 40?cm if using a portable unit).
5	Collimate to include diaphragm superiorly and pubic symphysis inferiorly.

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4.3 Cervical Spine – Lateral

| Step