



RADIOGRAPHIC TECHNIQUE-2

THORACIC SPINE

Sawa University

College of health and medical techniques

Department of Radiology Tech.

3rd Academic year

LEC.8

THEORETICAL

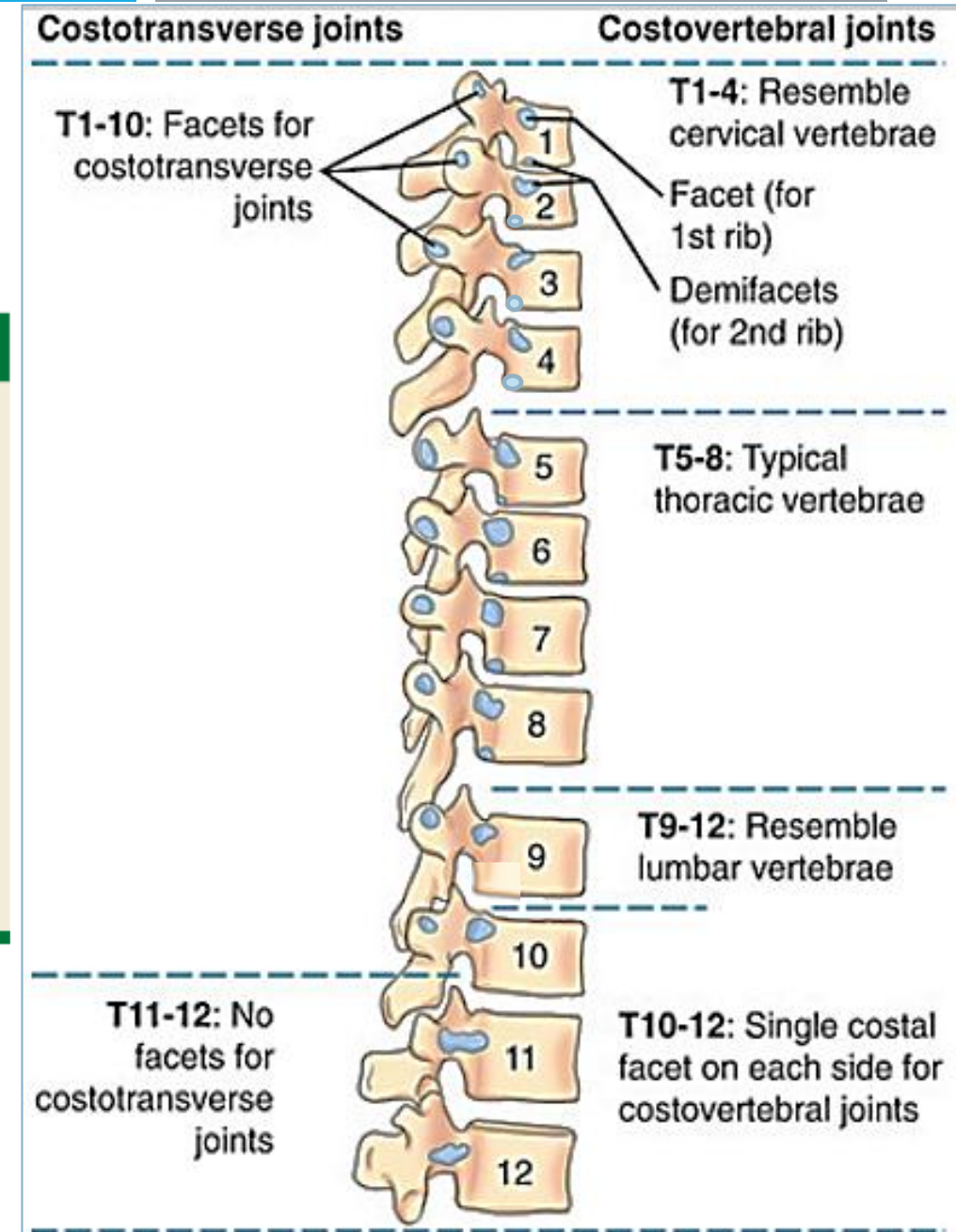
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M.Sc Radiology Technology**

THORACIC SPINE

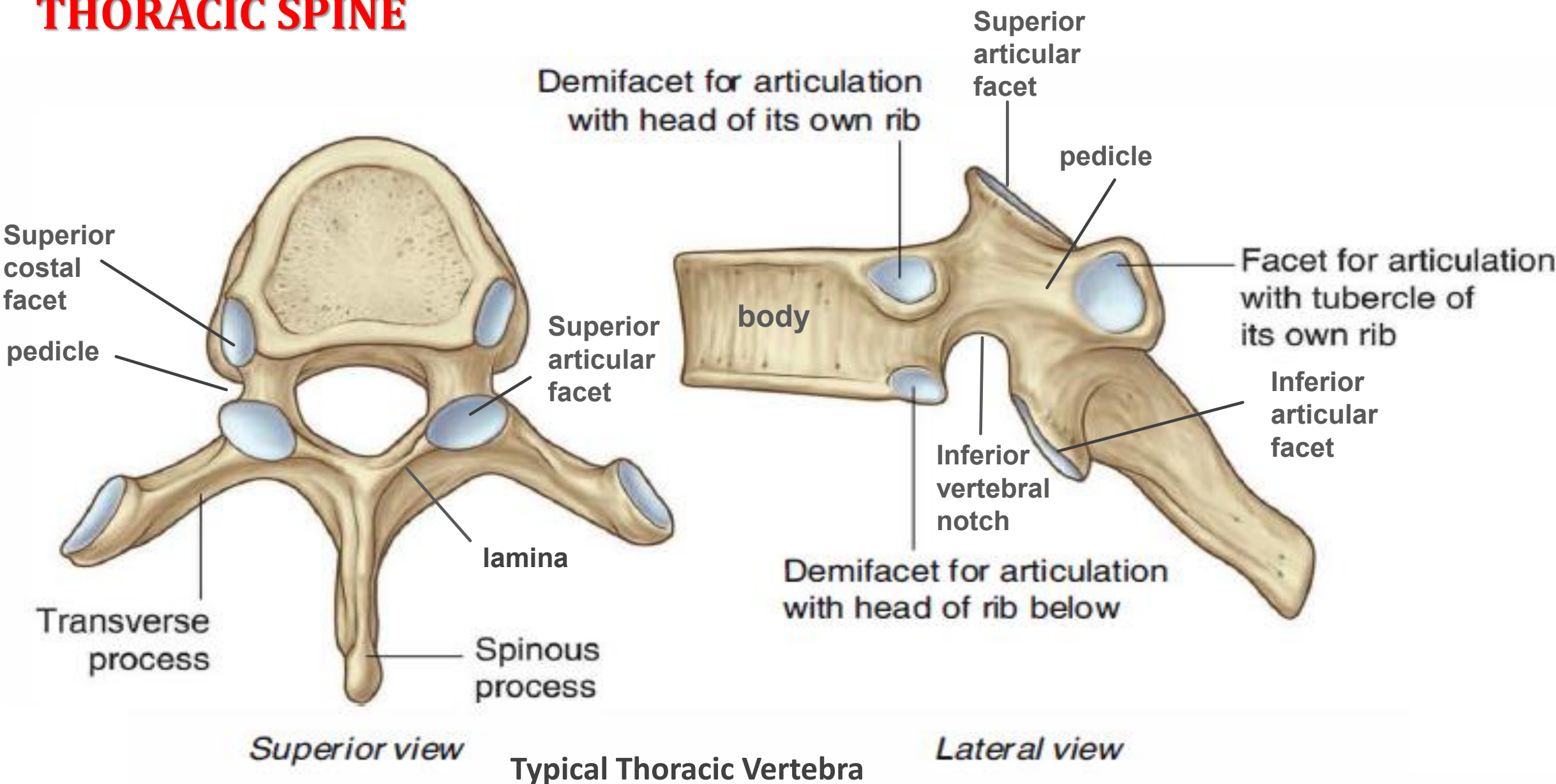
Costal facets and demifacets

Vertebrae	Vertebral Border	Facet/Demifacet
T1	Superior	Whole facet
	Inferior	Demifacet
T2-T8	Superior	Demifacet
	Inferior	Demifacet
T9	Superior	Demifacet
	Inferior	None
T10-T12	Superior	Whole facet
	Inferior	None

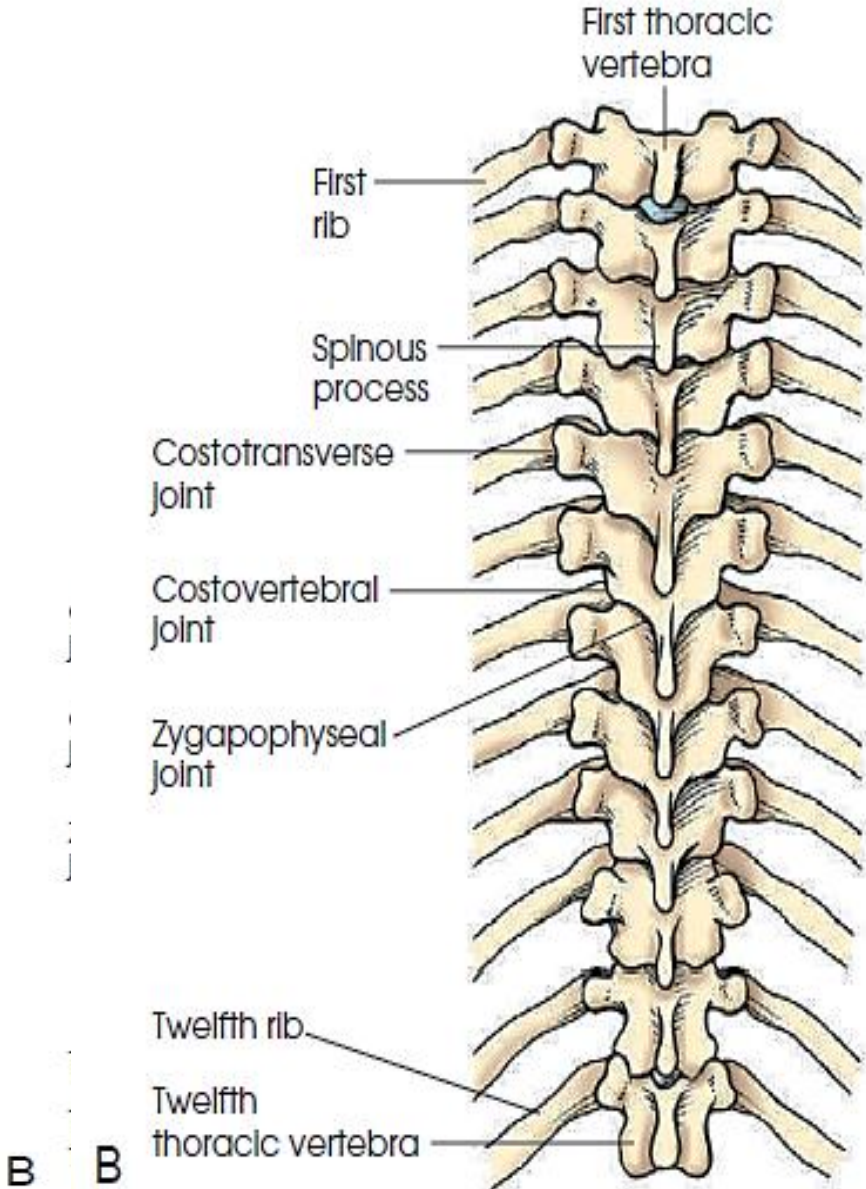
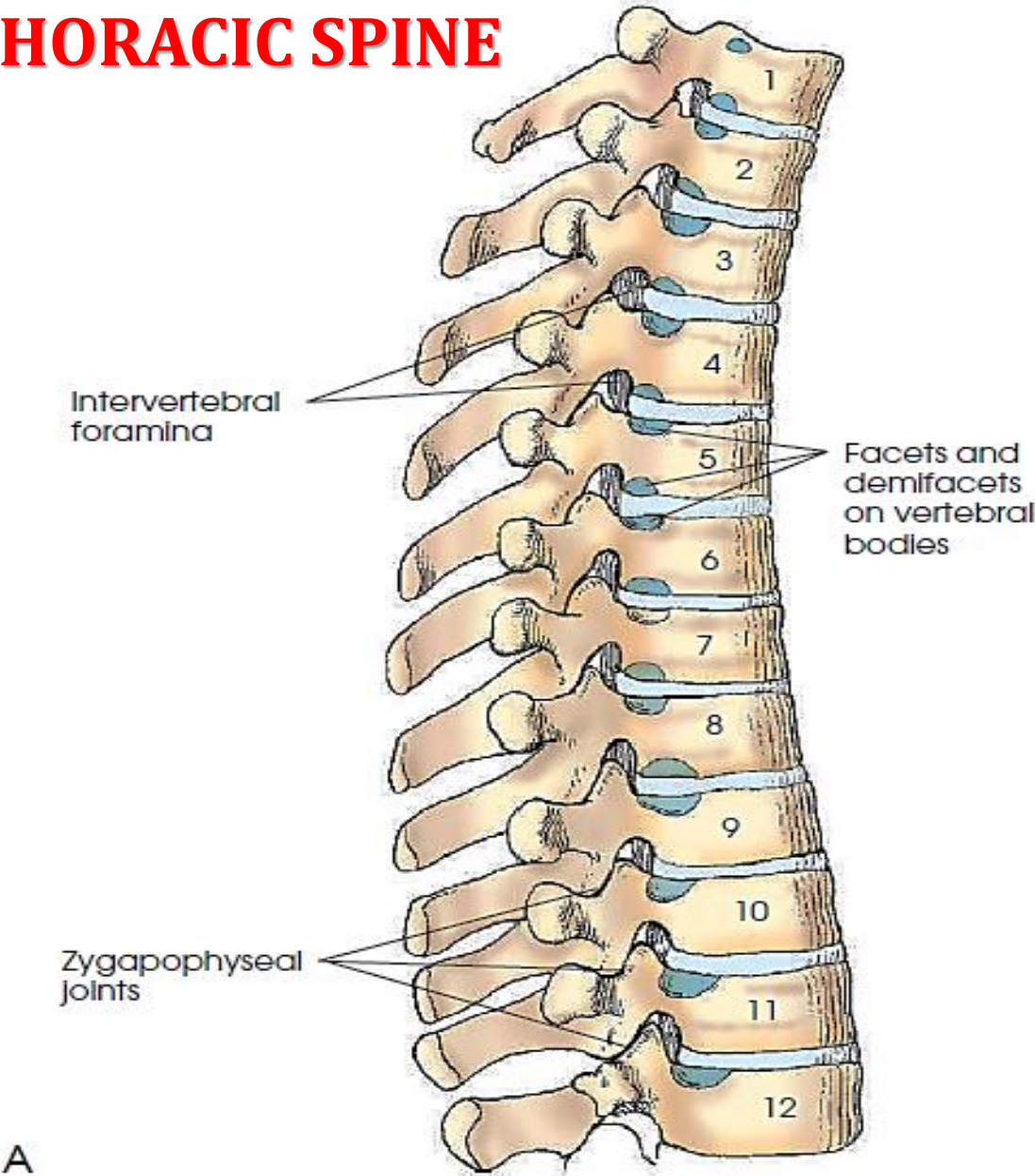
*On each side of a vertebral body.



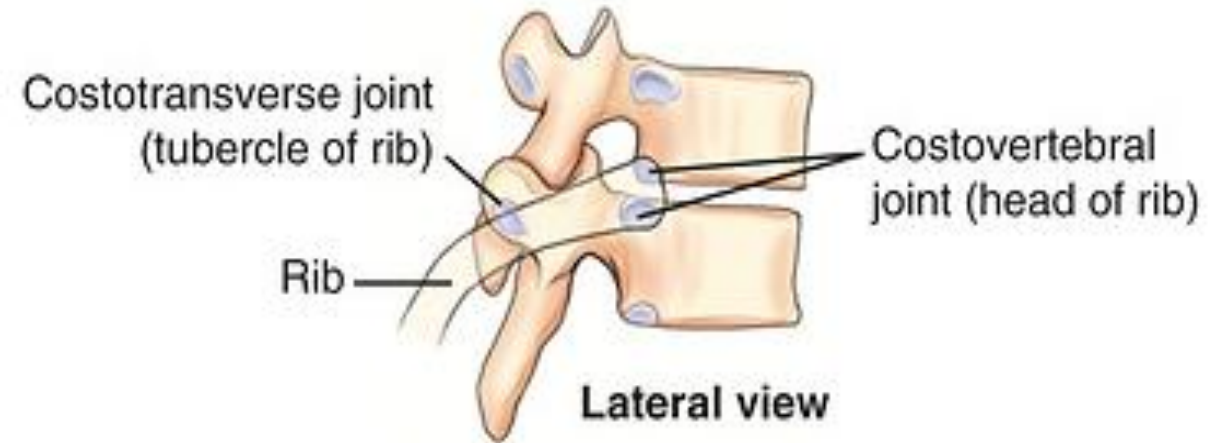
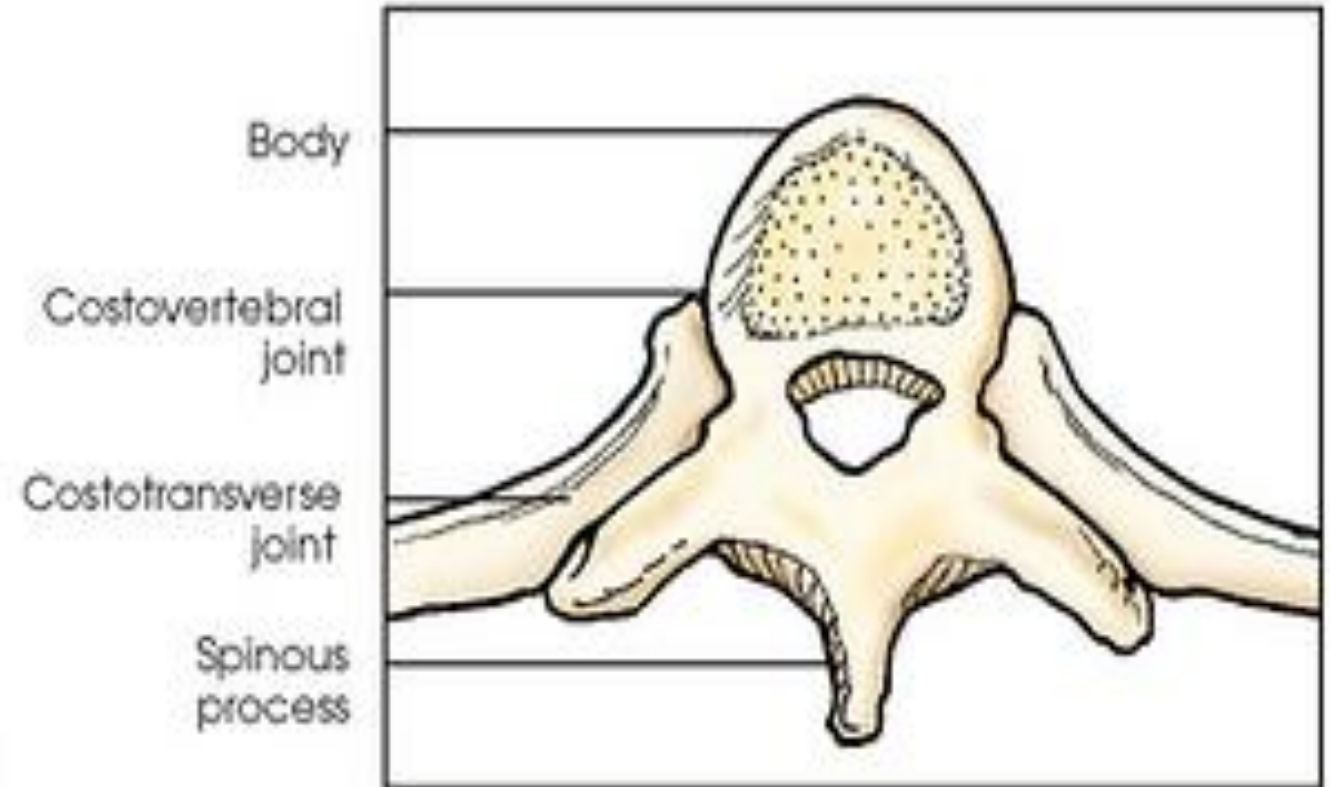
THORACIC SPINE



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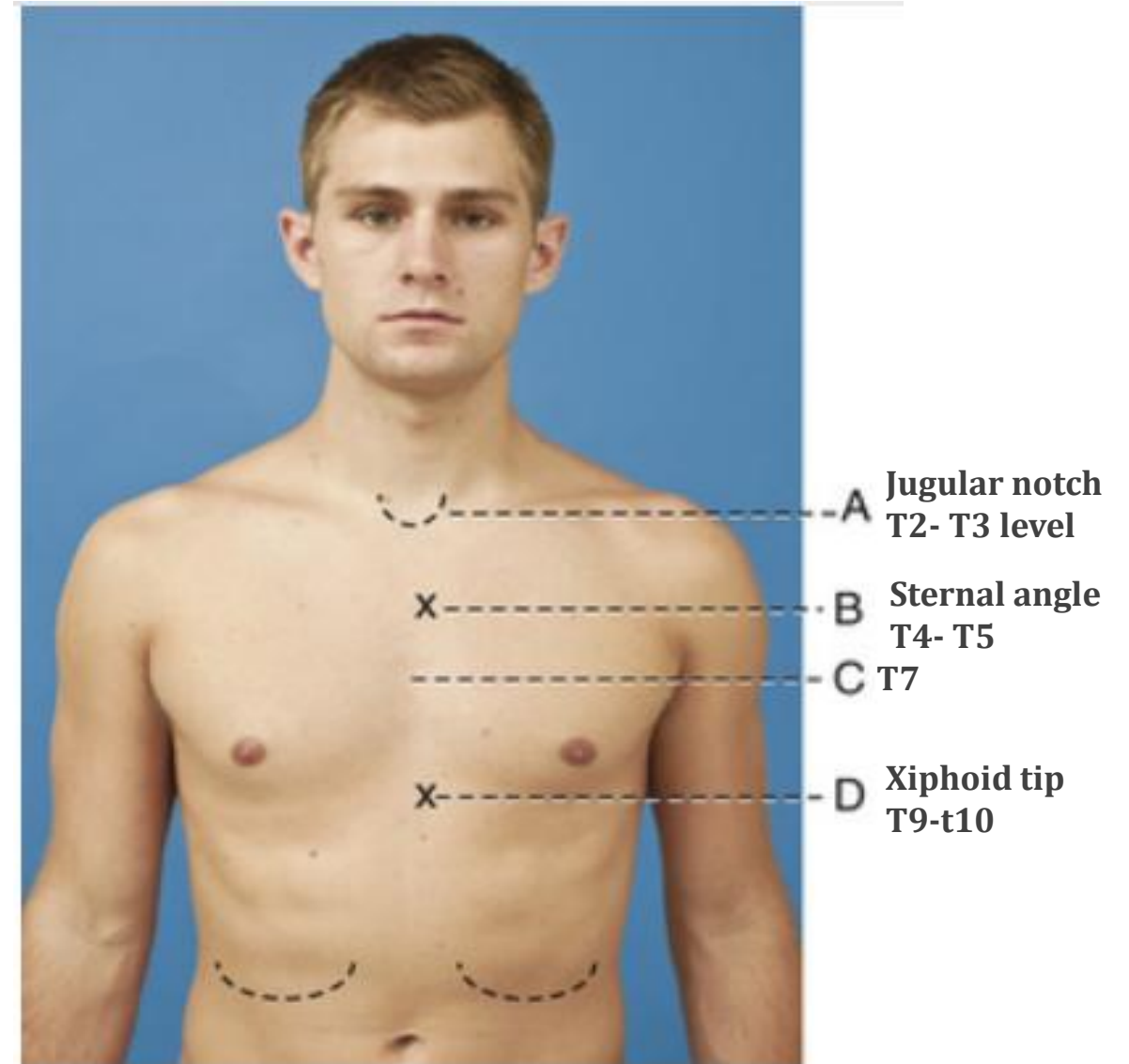
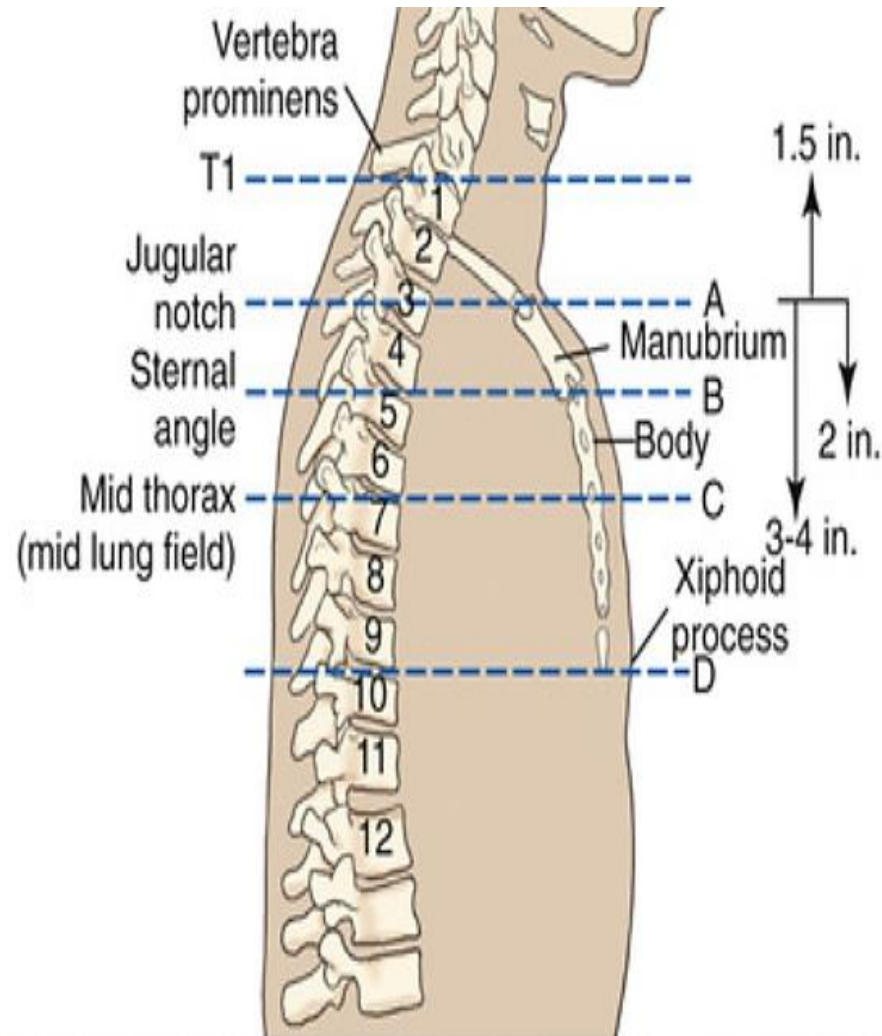


THORACIC SPINE

Sternum and Thoracic Spine Landmarks:

1. **T1** is about 4 cm superior to the level of the jugular notch or posteriorly at the prominent spinous process of C7, (vertebra prominens).
2. **T2- T3** levels are at the jugular notch
3. **T4- T5** junctions are at the sternal angle (5 cm inferior to the manubrial notch) and it's level of articulation of the second rib onto the sternum.
4. **T7** is located 8 to 10 cm inferior to the jugular notch or about 18 to 20 cm below the vertebra prominens.
5. **T9-T10** levels are at the xiphoid tip.

STERNUM AND THORACIC SPINE LANDMARKS:



THORACIC SPINE

Routine projections

1. AP
2. Lateral

Special

1. Oblique

1. AP projection

Clinical Indications: Pathology involving the thoracic spine such as compression fractures, subluxation, or kyphosis.

1. AP PROJECTION

Patient Position

- Supine (preferred) or erect position, spine aligned and centered to centerline.
- Flex hips and knees to reduce lordotic curvature.
- Top of IR (3 cm) above shoulder.
- Wedge compensation filter recommended.
- Note: Feet at cathode end (anode heel effect).

Central Ray: CR perpendicular to center of IR (at level of T7 as for an AP chest, **8-10 cm below jugular notch**).

Collimation: Long narrow collimation field to T spine region



1. AP PROJECTION

Technical Factors

SID: 102 cm

kV: 90

mAs: 20

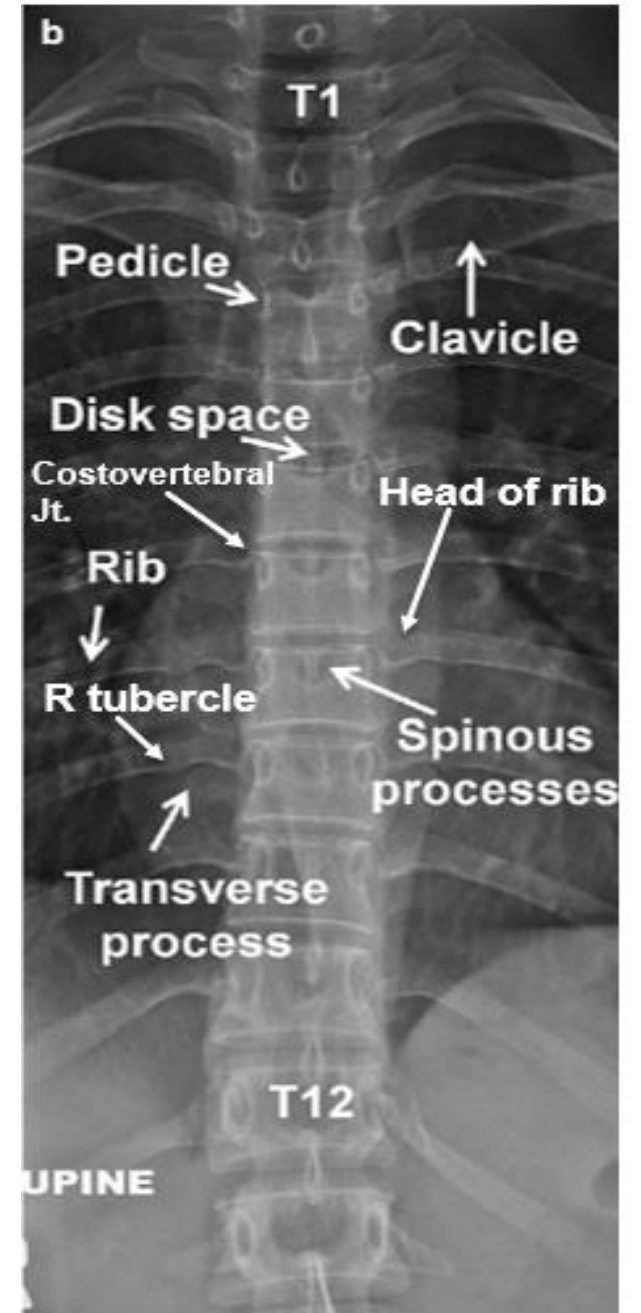
Grid: Yes

IR size: 17 × 14 inches L.W

Respiration: on expiration

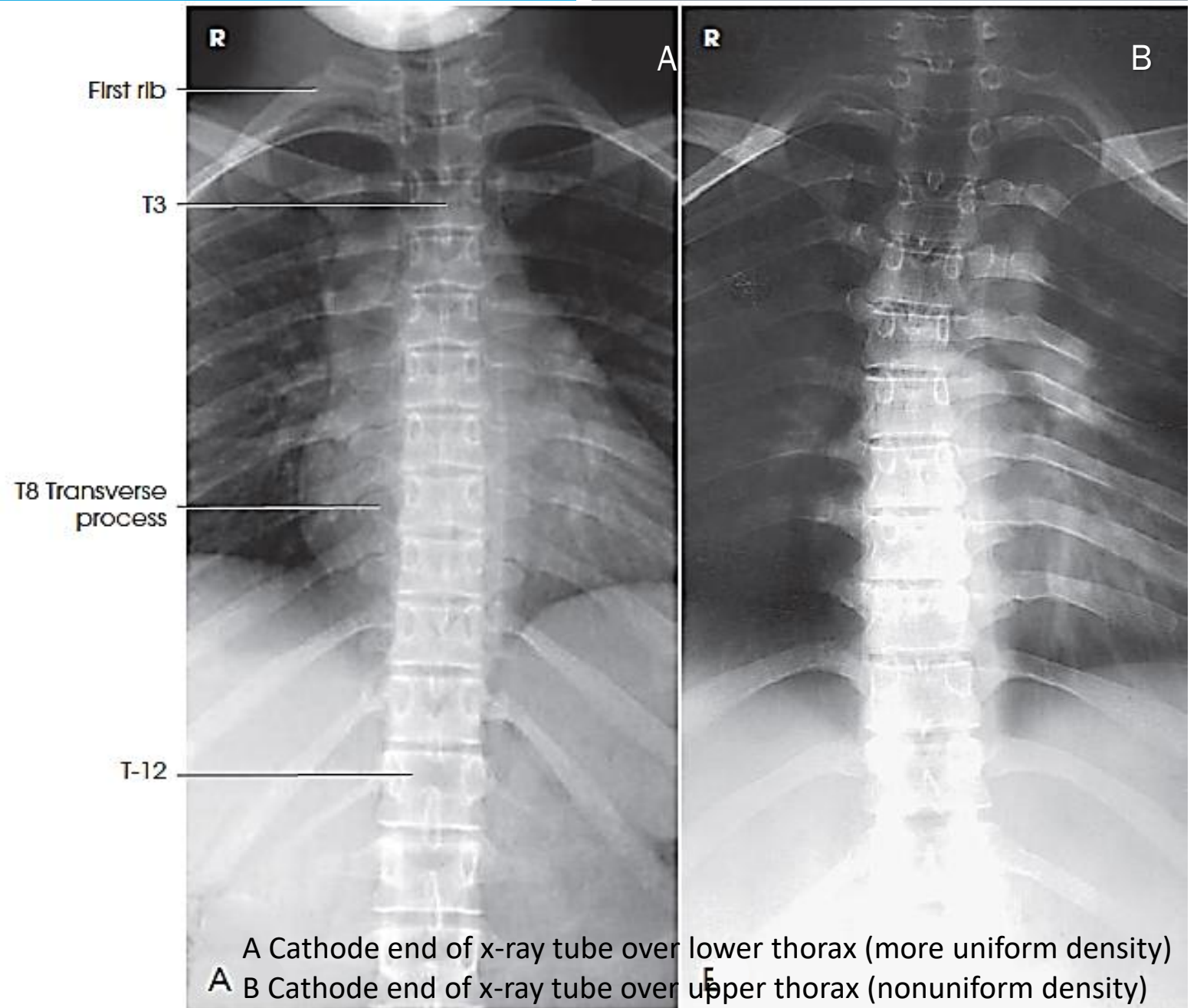
Evaluation Criteria

- Thoracic vertebral bodies, intervertebral joint spaces, spinous and transverse processes, posterior ribs, and costovertebral articulations
- No rotation, no motion.



ANODE HEEL EFFECT

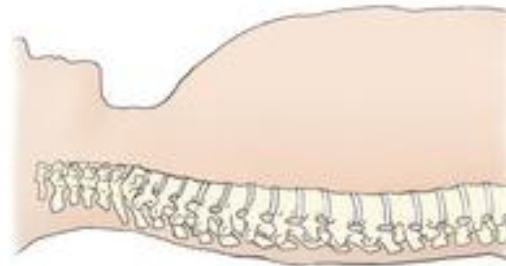
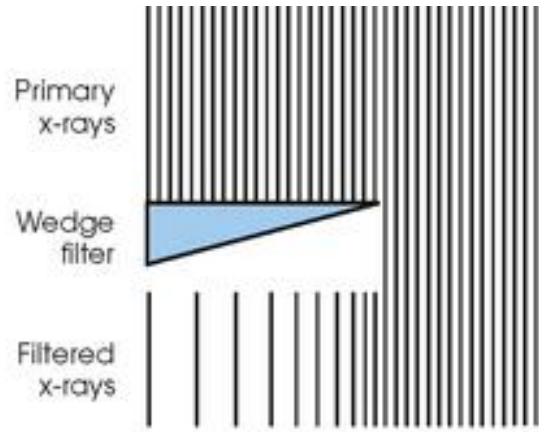
The anode heel effect will create more uniform density throughout the thoracic spine. With the tube positioned so that the cathode end is toward the feet, the greatest percentage of radiation goes through the thickest part of the thorax.



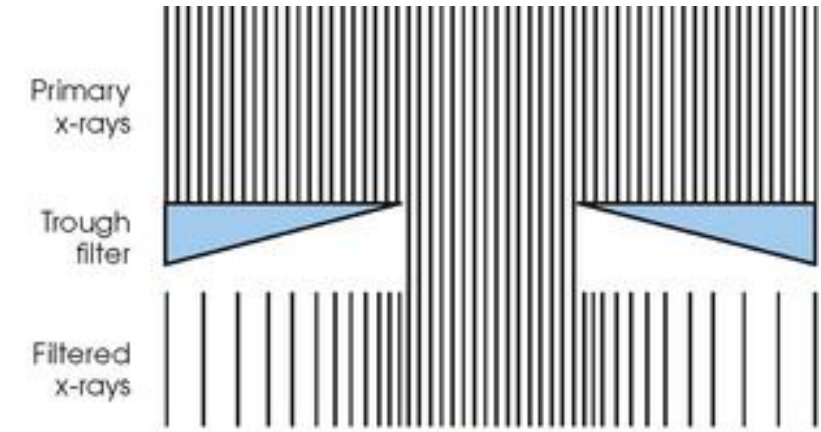
COMPENSATING FILTERS

A, Wedge filter in position for AP projection of thoracic spine: thick portion of wedge partially attenuates x-ray beam over upper thoracic area while nonfilter area receives full exposure to penetrate thick portion of spine. An even image density results.

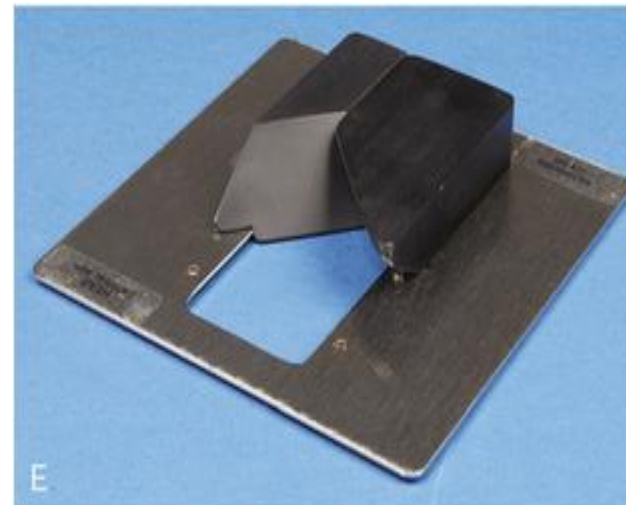
B, Trough filter in position for AP projection of chest: two side wedges partially attenuate x-ray beam over lung areas while mediastinum receives full exposure. **A better-quality image of chest and mediastinal structures results.**



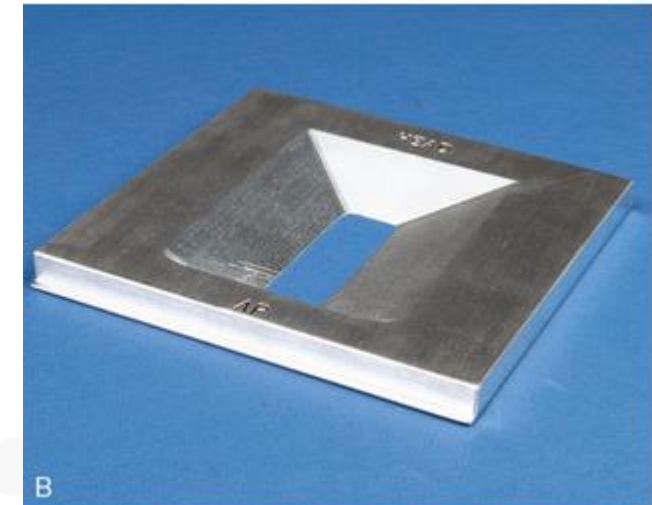
A



B



E



B

2. LATERAL PROJECTION

Clinical Indications: Pathology involving the thoracic spine, such as compression fractures, subluxation, or kyphosis.

Patient Position

- Recumbent, support under head, lateral (hips and knees flexed).
- Align and center midaxillary plane to centerline.
- Top of IR (3cm) above shoulders.
- Supports should be placed under lower back to straighten spine.
- If possible, use the **left lateral position** to place the heart closer to the IR.

Central Ray: CR perpendicular to IR and T7, → **8 to 10 cm below jugular notch, or 18 to 21 cm below the vertebra prominens).**



2. LATERAL PROJECTION

Collimation: Long, narrow collimation field to T spine region

Technical Factors

SID: 102 cm

IR size: 14 × 17 inches L.W

Respiration: on expiration

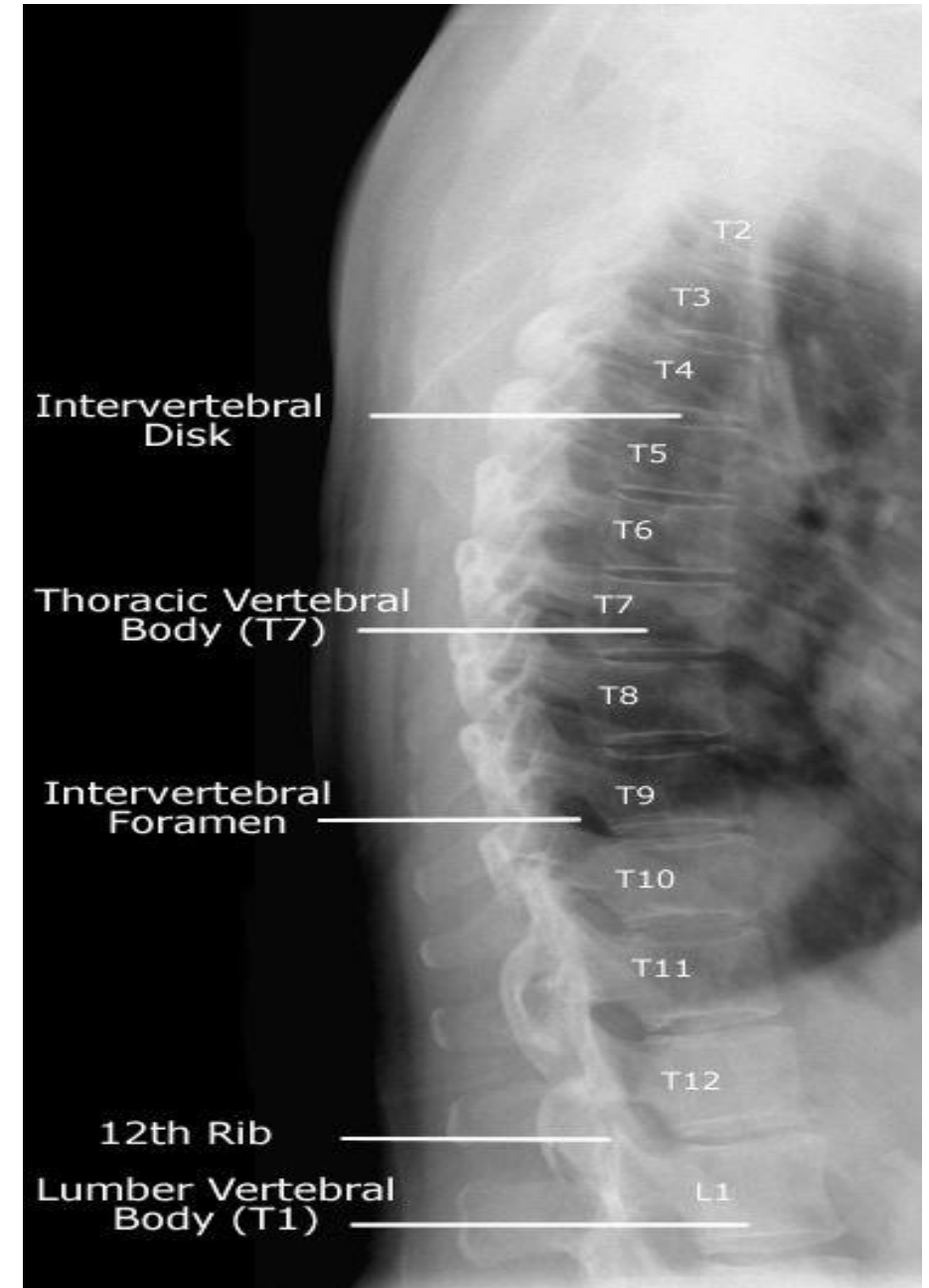
Grid: Yes

kV: 90

mAs: 56

Evaluation Criteria

- Thoracic vertebral bodies, intervertebral spaces, and intervertebral foramina.
- T1 to T3 will not be well visualized. Obtain a lateral image using a (swimmer's) lateral if the upper thoracic vertebrae are of special interest



3. OBLIQUE PROJECTION/ Anterior or Posterior Oblique Position

Clinical Indications

Pathology involving the zygapophyseal joints of the thoracic spine. Both right and left oblique projections are taken for comparison.

Patient Position (RPO -20° from lateral)

- Recumbent position (preferred) or erect, rotated posteriorly 20° from lateral
- Top of IR ≈(3 cm) above shoulders
- **Anterior Oblique Position (Recumbent) LAO or RAO:** Place arm nearest IR down and posterior; arm nearest tube up and forward ➡ *recommended because of significantly lower breast dose.*
- **Posterior Oblique Position (Recumbent) LPO or RPO:** Place arm nearest IR up and forward; arm nearest tube down and posterior

Note: Both RT. And LT. oblique projections have generally taken for comparison.

3. OBLIQUE PROJECTION/ Anterior or Posterior Oblique Position

Central Ray: CR to T7 to 10 cm below jugular notch or 5 cm below sternal angle.

Collimation: Long, narrow collimation field to T spine region

Technical Factors

SID: 102 cm

IR size: 14 × 17 inches L.W

Respiration: full expiration

kV: 90

mAs: 56

Grid: Yes



3. OBLIQUE PROJECTION/ Anterior or Posterior Oblique Position

Evaluation Criteria: Zygapophyseal joints

- Anterior oblique positions (RAO and LAO) demonstrate the downside zygapophyseal joints, and posterior oblique positions (RPO and LPO) demonstrate the upside joints.
- The zygapophyseal joints of the side of interest should be open. However, the amount of kyphosis will determine how many zygapophyseal joints will be clearly seen.



*Believe in your
dreams and have a
beautiful day*

