

By  
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**radiographic techniques for upper limbs**



# Basic Principles of Radiography and Digital Technology

At the end of this lecture the student should learn

Anatomical position

Patient aspect

Planes of the body

Positioning terminology

# TERMINOLOGY



The human body is a complicated structure, and errors in radiographic positioning or diagnosis can easily occur unless practitioners have a common set of rules that are used to describe the body and its movement.

# TERMINOLOGY



- Anatomical terminology
- Positioning terminology
- Projection terminology

# Anatomical terminology

Patient aspect □

**Anterior aspect:** that seen when viewing the patient from the front.

- **Posterior (dorsal) aspect:** that seen when viewing the patient from the back.

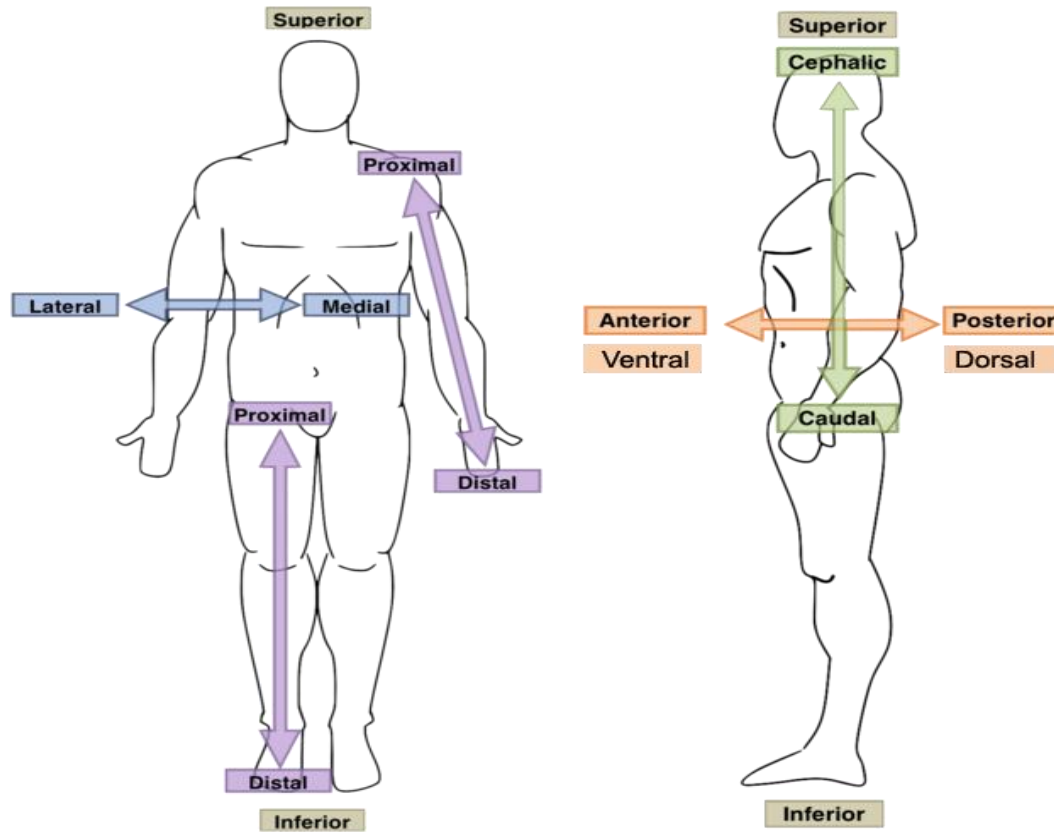
- **Lateral aspect:** refers to any view of the patient from the side. The side of the head would therefore be the lateral aspect of the cranium.

- **Medial aspect:** refers to the side of a body part closest to the midline, e.g. the inner side of a limb is the medial aspect of that limb.

# Anterior and posterior aspect of the body



# Lateral aspect of body and medial



# Planes of the body

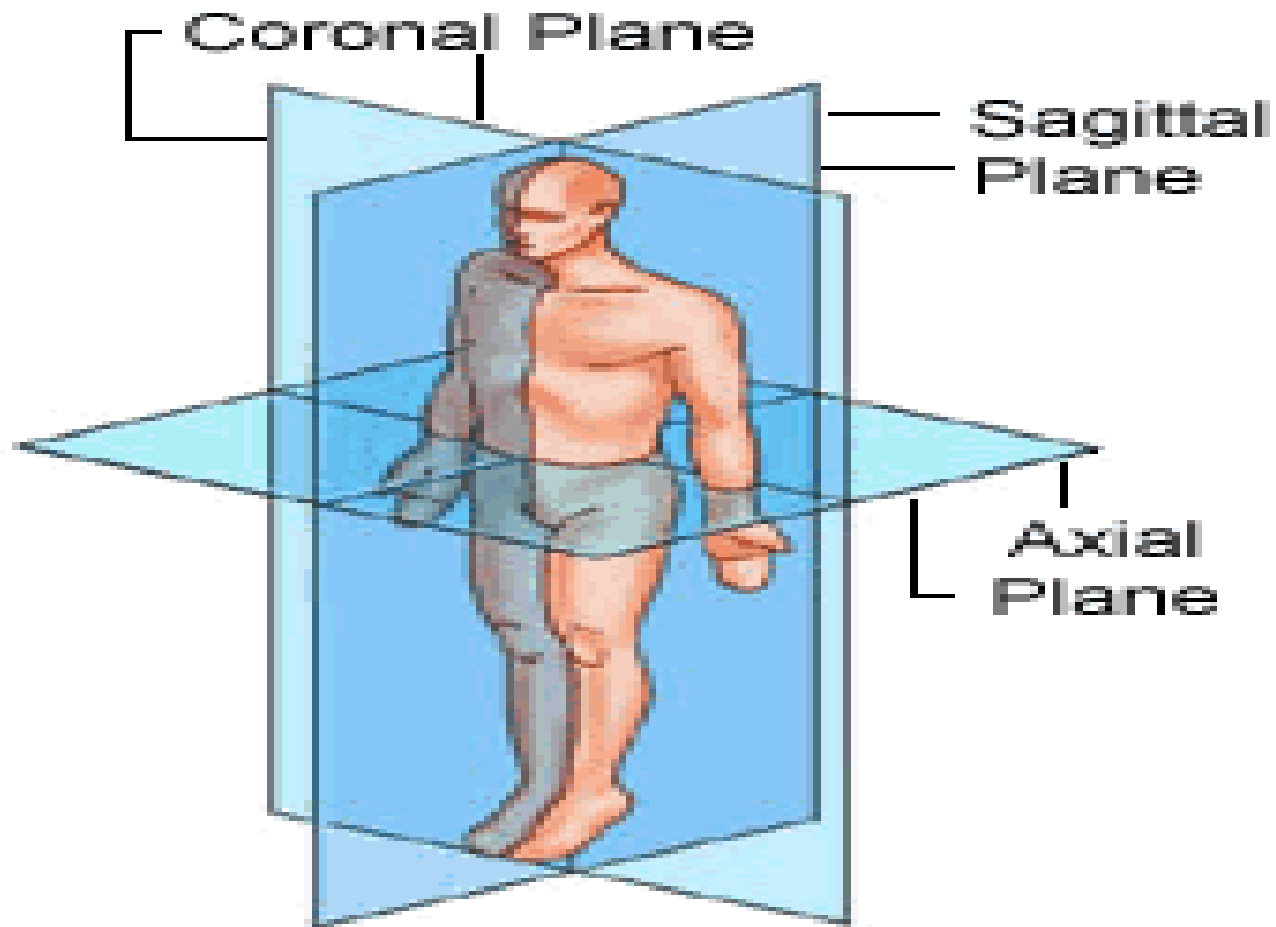
**Median sagittal plane:** divides the body into right and left

halves. Any plane that is parallel to this but divides the body

into unequal right and left portions is known simply as a sagittal plane or parasagittal plane.

- **Coronal plane:** divides the body into an anterior part and a posterior part.
- **Transverse or axial plane:** divides the body into a superior part and an inferior part.

# Planes of the body



# Positioning terminology

**Supine (dorsal decubitus):** lying on the back.

- **Prone (ventral decubitus):** lying face-down.

- **Lateral decubitus:** lying on the side. Right lateral decubitus –

lying on the right side. Left lateral decubitus – lying on the

left side.

- **Semi-recumbent:** reclining, part way between supine and sitting

erect, with the posterior aspect of the trunk against the cassette.

# Positioning terminology



**(a) Supine**



**(b) Prone**



**(c) Right lateral decubitus**



**(d) Left lateral decubitus**

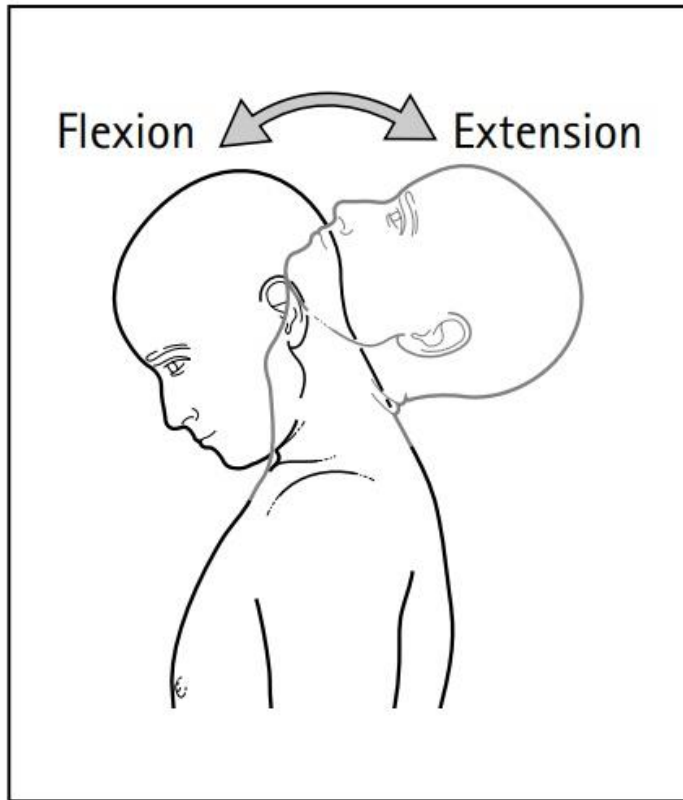
# Positioning terminology (contd)

## Terminology used to describe the limb position

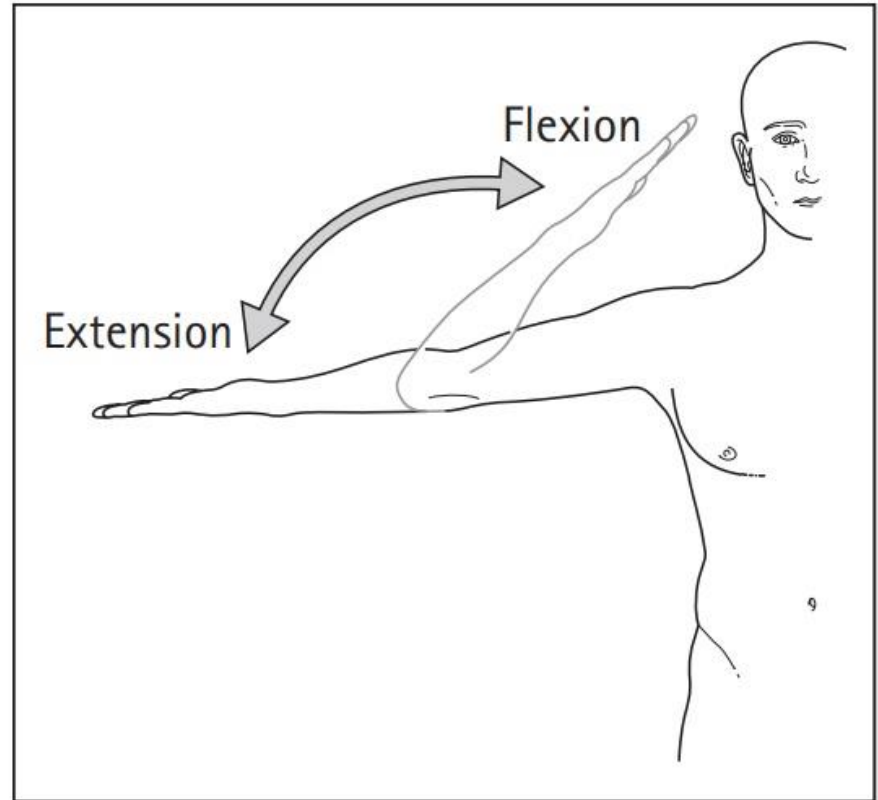
**Extension:** when the angle of the joint increases.

- **Flexion:** when the angle of the joint decreases.
- **Abduction:** refers to a movement away from the midline.
- **Adduction:** refers to a movement towards the midline.
- **Rotation:** movement of the body part around its own axis, e.g. medial (internal) rotation towards the midline, or lateral (external) rotation away from the midline.
- **Pronation:** movement of the hand and forearm in which the palm is moved from facing anteriorly (as per anatomical position) to posteriorly. **Supination** is the reverse of this. Other movement terms applied to specific body parts are described in the diagrams.

# Positioning terminology



Flexion and extension of neck



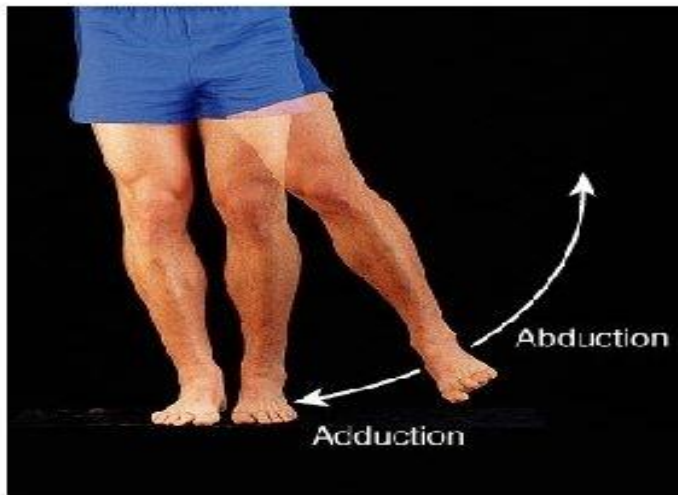
Flexion and extension of elbow

# Positioning terminology

## Types of joint movement at synovial joints-angular

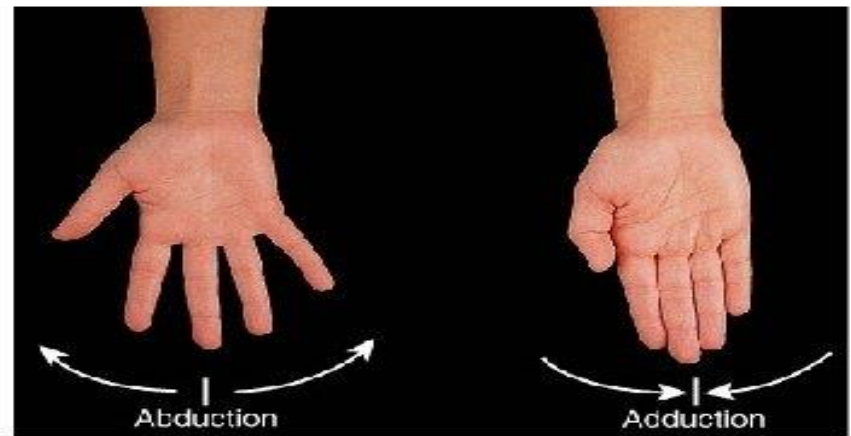
**Abduction**-movement away from the midline

**Adduction**-movement toward the midline



(c) Hip joint

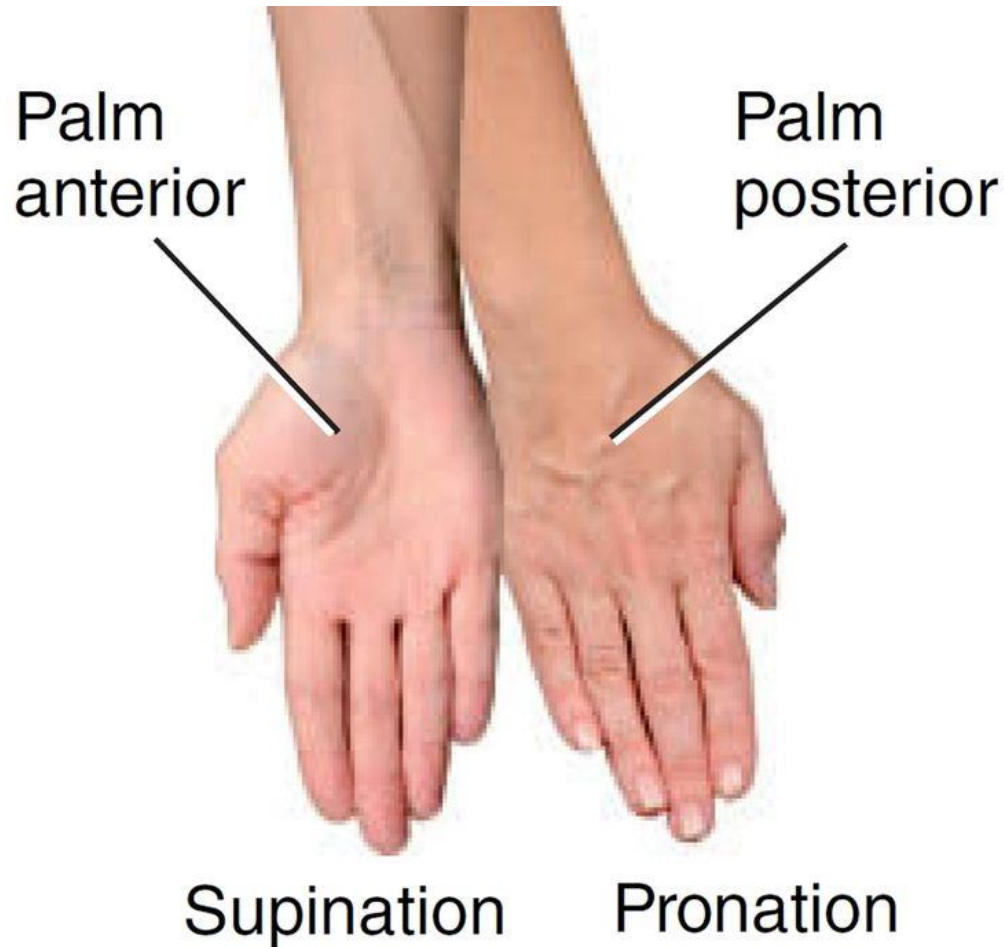
John Wilson White



(d) Metacarpophalangeal joints of the fingers (not the thumb)

John Wilson White

# Pronation and supination of hand/forearm



# Projection terminology

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**projection** is described by the direction of the central ray relative to aspects and planes of the body.

Antero-posterior

Postero-anterior

Lateral

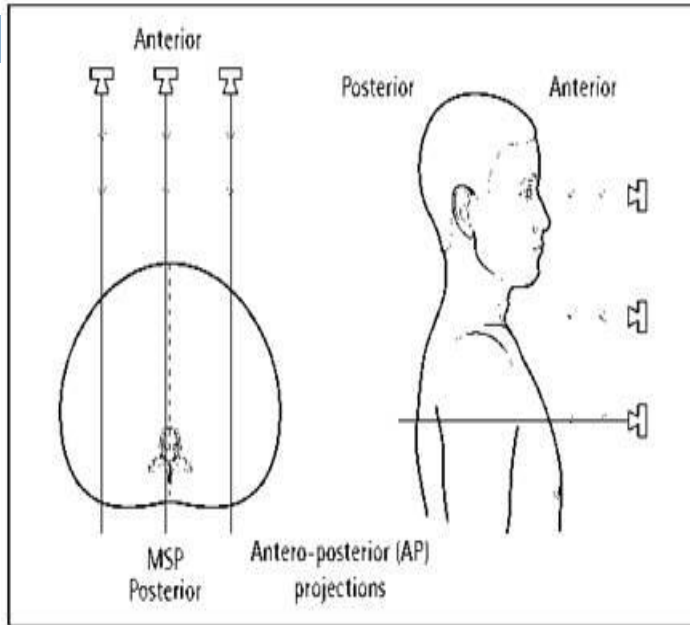
oblique

# Antero-posterior & Postero-anterior

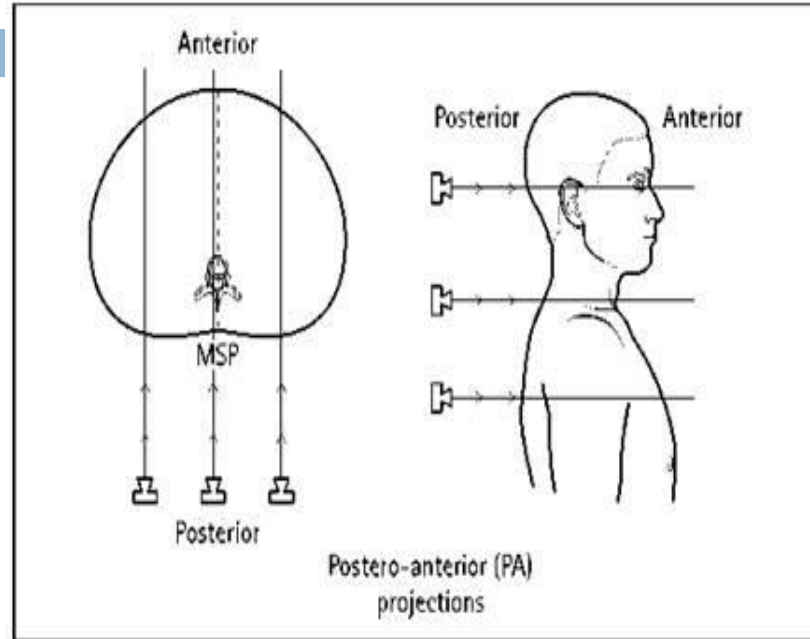
**Antero-posterior** : The central ray is incident on the anterior aspect, passes along or parallel to the median sagittal plane, and emerges from the posterior aspect of the body.

**Postero-anterior**: The central ray is incident on the posterior aspect, passes along or parallel to the median sagittal plane, and emerges from the anterior aspect of the body.

# AP



# PA



## AP Projection



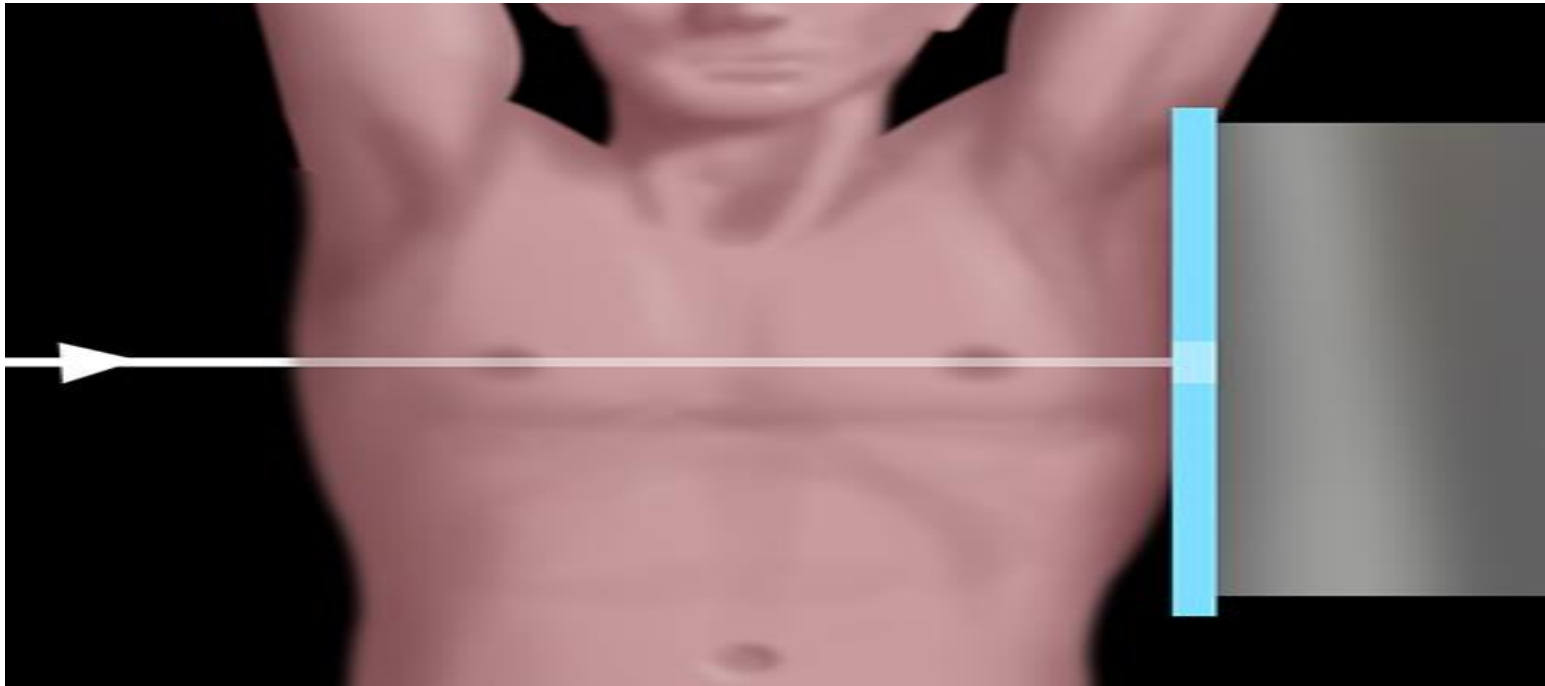
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# Lateral

## Lateral:

The central ray passes from one side of the body to the other along a coronal and transverse plane.



# Posterior oblique

## Posterior oblique

The central ray enters the anterior aspect, passes along a transverse

plane at some angle to the median sagittal plane, and emerges from the posterior aspect. Again, the projection is

described by the side of the torso closest to the cassette. The

diagram below shows a left posterior oblique.

# Oblique

The central ray passes through the body along a transverse plane at some angle between the median sagittal and coronal planes. For this projection, the patient is usually positioned with the median sagittal plane at some angle between zero and 90 degrees to the cassette, with the central ray at right-angles to the cassette. If the patient is positioned with the median sagittal plane at right-angles to or parallel to the cassette, then the projection is obtained by directing the central ray at some angle to the median sagittal plane

# Oblique

## Anterior oblique

The central ray enters the posterior aspect, passes along a transverse

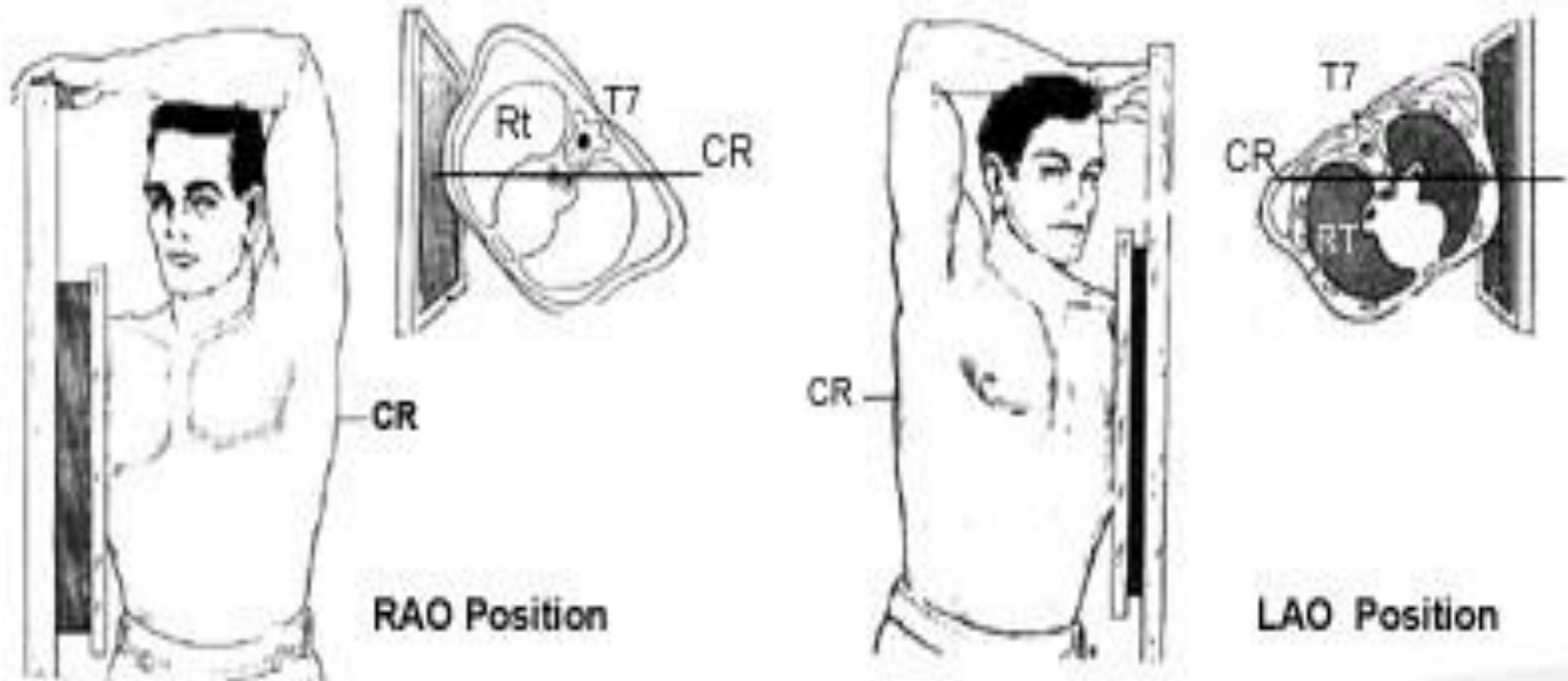
plane at some angle to the median sagittal plane, and emerges from the anterior aspect. The projection is also described

by the side of the torso closest to the cassette. In the diagram

below, the left side is closest to the cassette, and therefore the

projection is described as a left anterior oblique

# Anterior oblique



*Anterior (PA) oblique projections -- the side of interest is the side furthest from the cassette. Image courtesy of Dr. Naveed Ahmad.*

# Posterior oblique

Posterior oblique:

The central ray enters the anterior aspect, passes along a transverse

plane at some angle to the median sagittal plane, and emerges from the posterior aspect. Again, the projection is

described by the side of the torso closest to the cassette. The

diagram below shows a left posterior oblique.