



RADIOGRAPHIC TECHNIQUE-1

TERMINOLOGY, BODY PLANES, LINES, BODY POSITION

Sawa University

College of health and medical techniques

Department of Radiology Tech.

2nd Academic year

LEC.1

THEORETICAL

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General Terms

- **Radiograph:** an image of a patient's anatomic part(s), as produced by the action of x-rays on an image receptor(IR).
- **Radiography:** the process and procedures of producing a radiograph.
- **X-ray film:** refers to the physical piece of material on which a latent (non-processed) radiographic image is stored.
- **Image receptor (IR):** the device that captures the radiographic image that exits the patient.
- **Central ray (CR):** refers to the centermost portion of the X-ray beam emitted from the X-ray tube.
- **Anatomic Position:** is a reference position that defines specific surfaces and planes of the body.

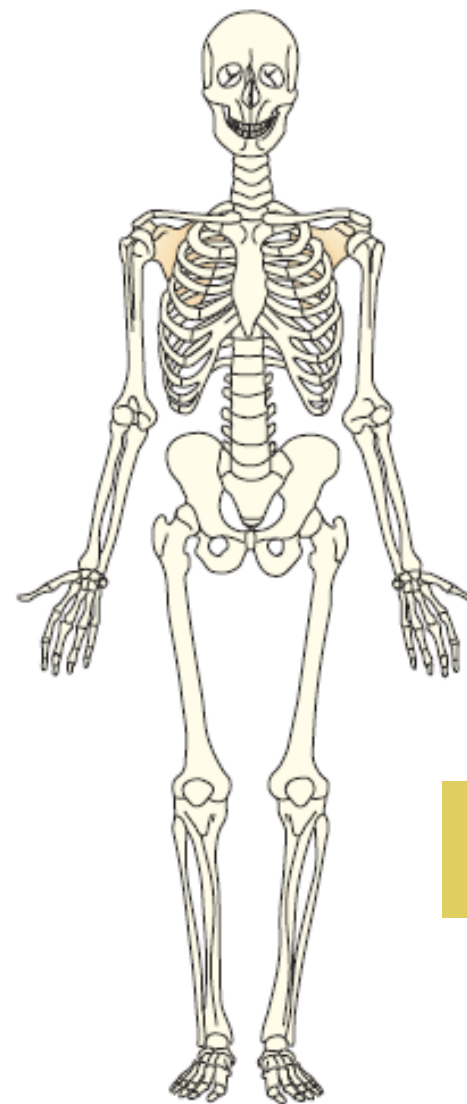




The Anatomic Position

The anatomic position of the body is:

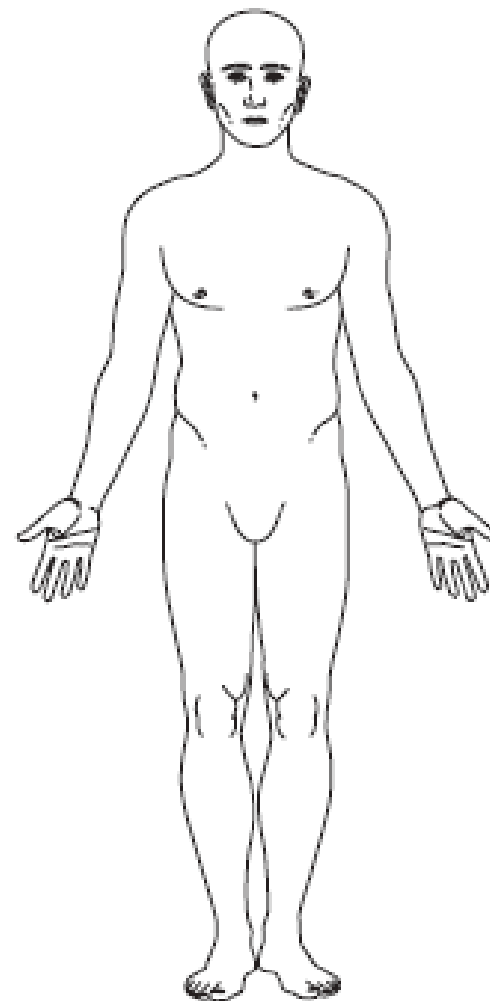
- An upright position with arms abducted slightly (down).
- Hands by side with palms forward.
- Head and feet together and directed straight ahead.



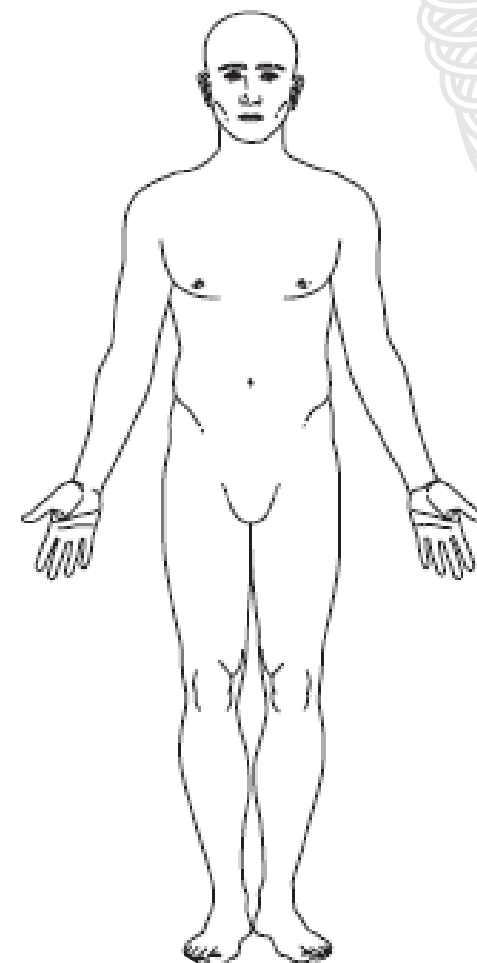


Anatomical Terminology/ Patient Aspect

1. **Anterior aspect:** that seen when viewing the patient from the front.
2. **Posterior (dorsal) aspect:** that seen when viewing the patient from the back.
3. **Lateral aspect:** refers to any view of the patient from the side.
4. **Medial aspect:** refers to the side of a body part closest to the midline.



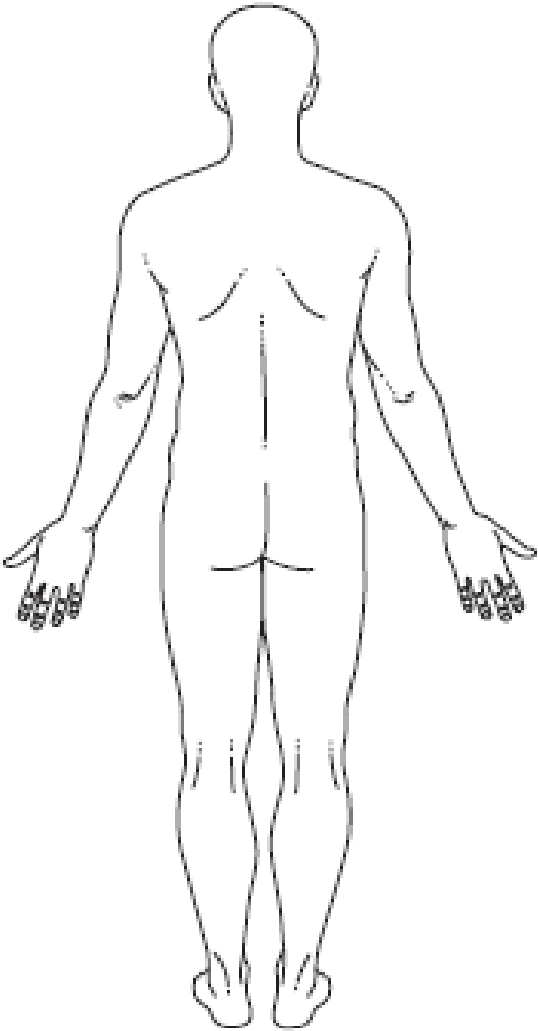
Anatomical position



Anterior aspect of body



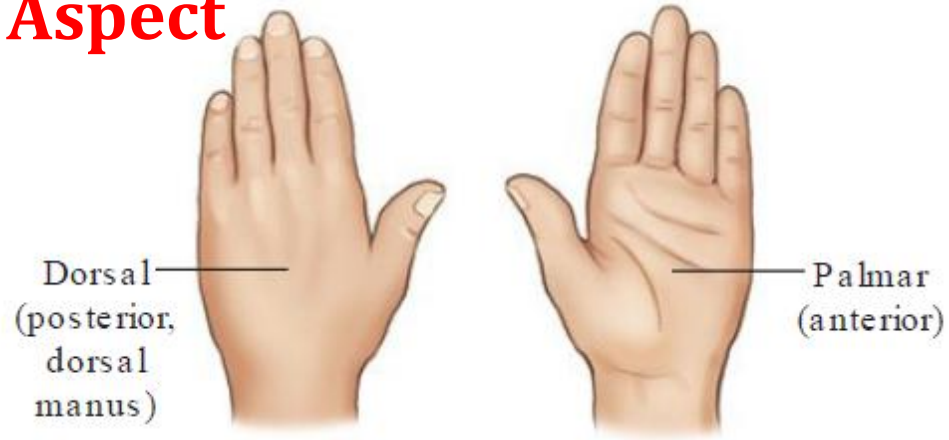
Anatomical Terminology/ Patient Aspect



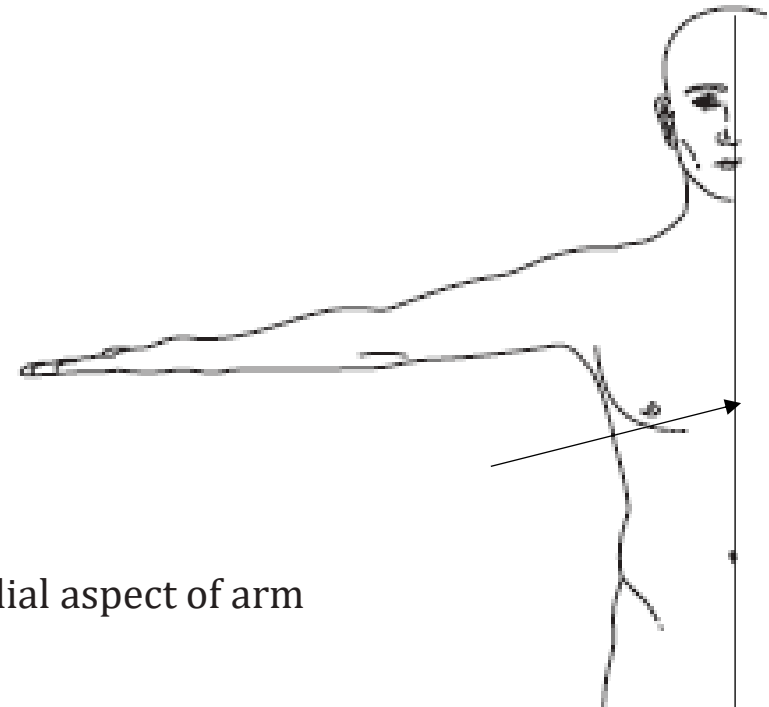
Posterior aspect of body



Lateral aspect of body



Dorsal and palmar surfaces of hand




Medial aspect of arm



Positioning Terminology/ Body Planes or Sections

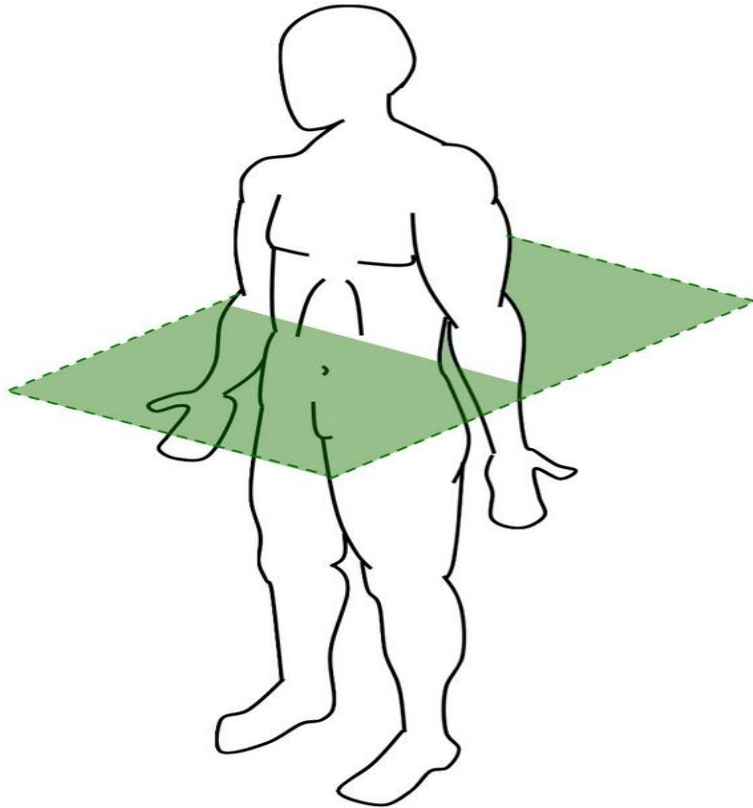
Positioning terms that describe CR angles or relationships between body parts often are related to imaginary planes that pass through the body in the anatomic position.

Four common planes used in medical imaging are:

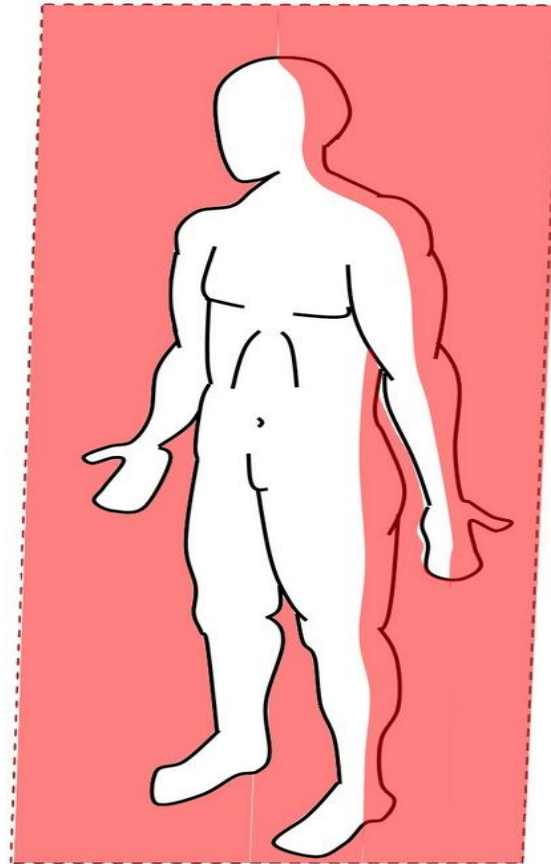
1. **Median sagittal plane:** divides the body into **right** and **left** halves. Any plane that is parallel to this but divides the body into unequal **right** and **left** portions is known as a sagittal plane or parasagittal plane.
 2. **Coronal plane:** divides the body into **anterior** and **posterior** parts.
 3. **Transverse or axial plane:** divides the body into an **inferior** and **superior** part.
 4. **Oblique Plane:** an oblique plane is a longitudinal or transverse plane at an angle or slant and not parallel to the sagittal, coronal, or horizontal plane.
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Positioning Terminology/ Body Planes or Sections

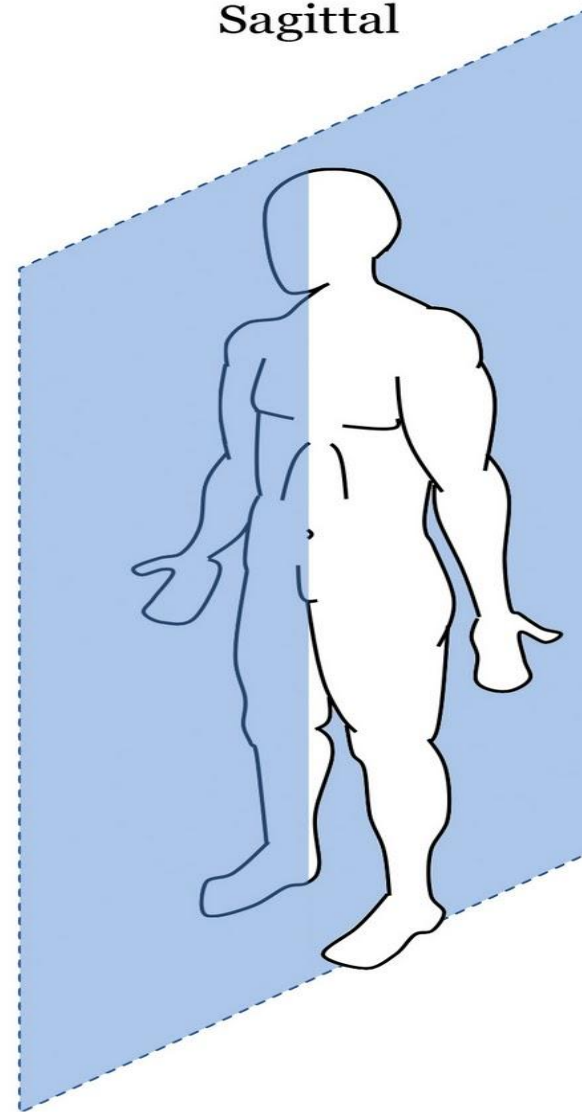
Transverse



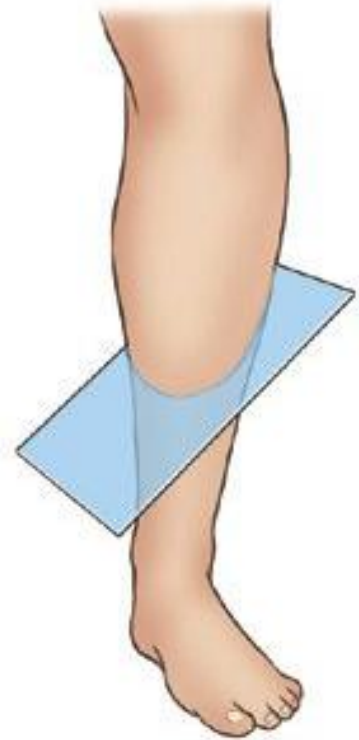
Frontal



Sagittal



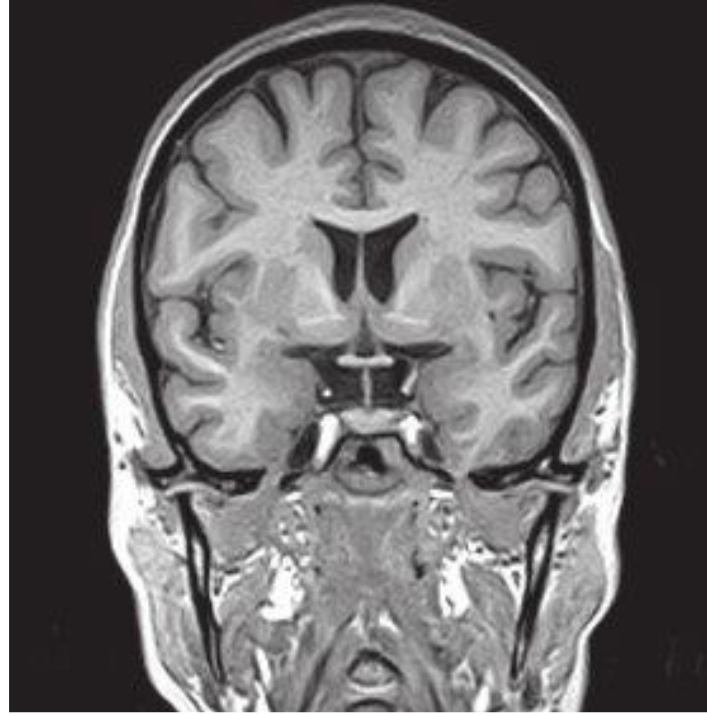
Oblique Plane



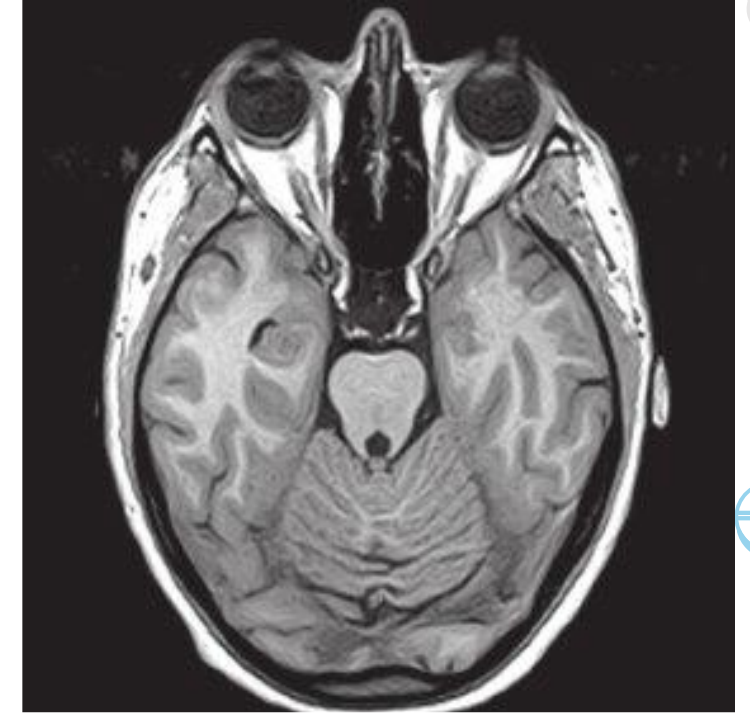
Positioning Terminology/ Body Planes or Sections



Sagittal image.
(axial) image.



Coronal image




Transverse



Positioning Terminology/ Body Position

The most used general body positions in medical imaging are:

1. **Erect (upright):** either standing or sitting.
 2. **Supine:** lying on back
 3. **Prone:** abdomen facing downward (head may be turned to one side).
 4. **Recumbent (reclining)** lying down in any position (prone, supine, or onside).
 5. **Decubitus:** lying down
 6. **Lateral:** side touches the cassette
 7. **Oblique Position:** refers to an angled position in which neither the sagittal nor the coronal body plane is perpendicular or at a right angle to the IR.
 8. **Left and Right Posterior Oblique (LPO and RPO) Positions:** describe the oblique positions in which the left or right posterior aspect of the body is closest to the IR.
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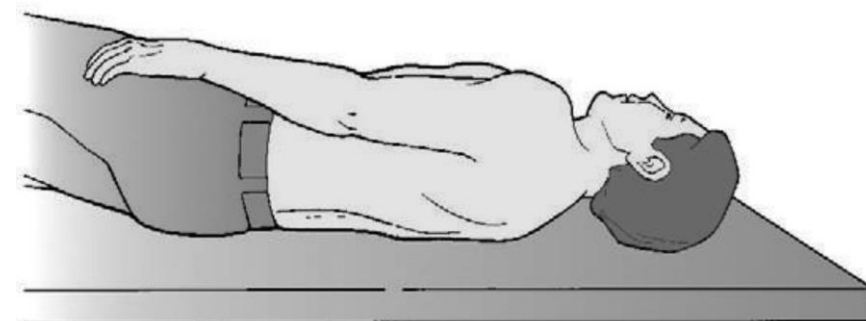
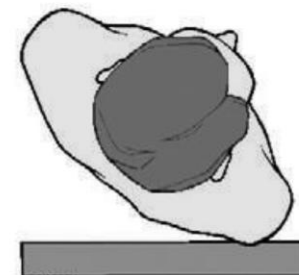
Body Position



Erect (upright)



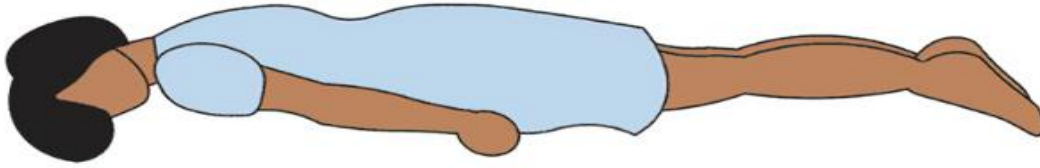
Erect(sitting)



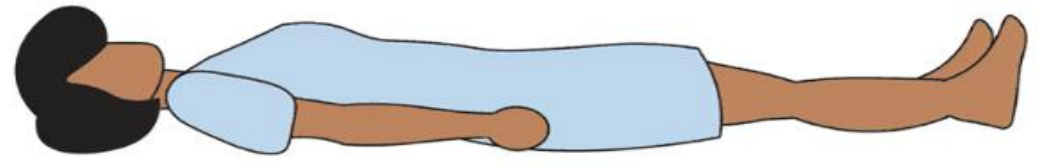
RPO radiographic position



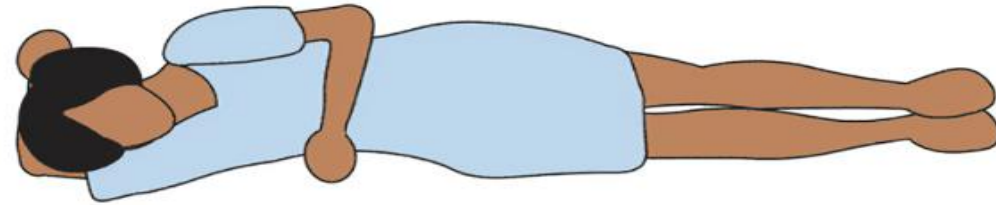
Body Position



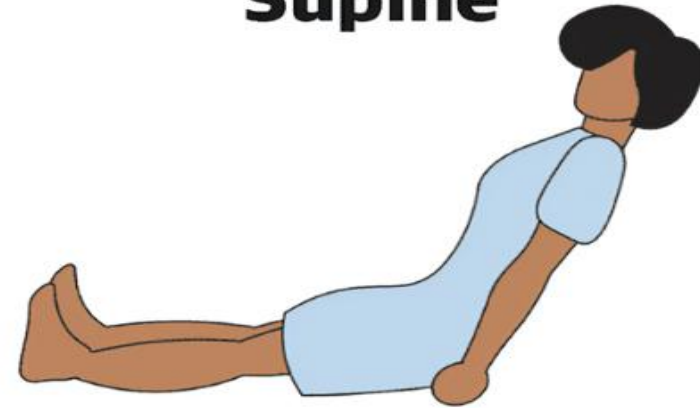
Prone



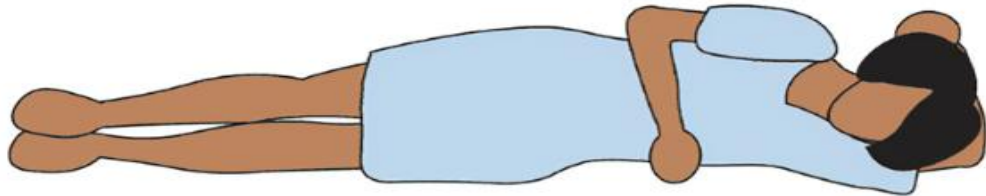
Supine



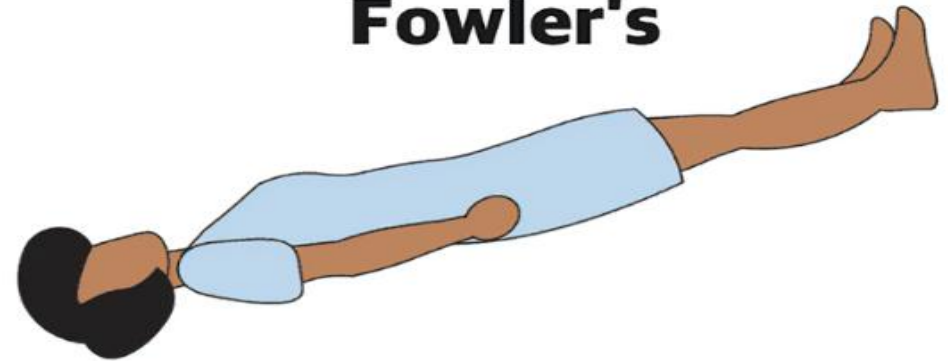
Right Lateral Recumbent



Fowler's



Left Lateral Recumbent



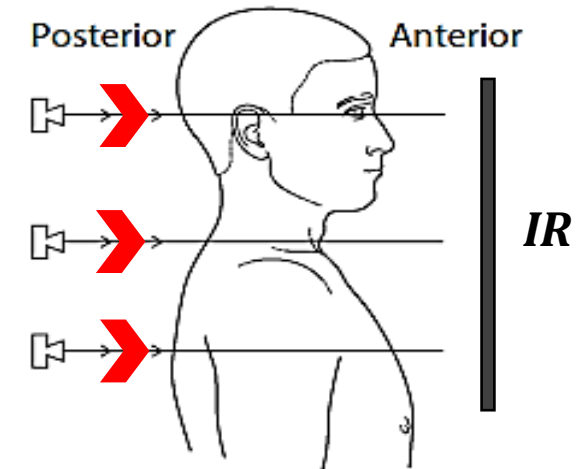
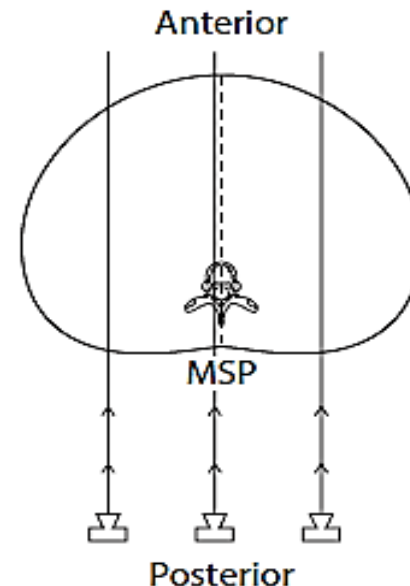
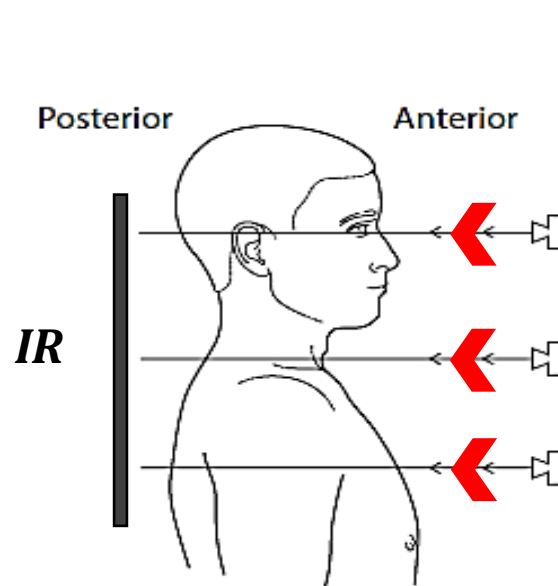
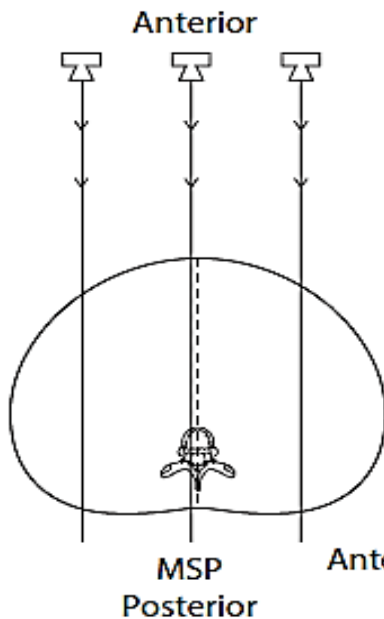
Trendelenburg



Projection Terminology

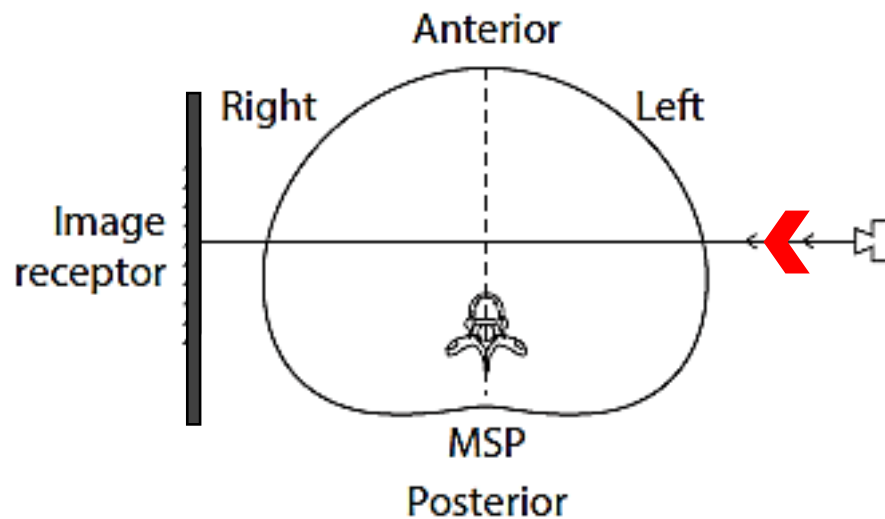
A projection is described by the direction and location of the collimated X-ray beam relative to aspects and planes of the body.

1. **Antero-posterior:** the collimated X-ray beam (CR) passes, perpendicular to the coronal plane, from anterior to posterior
2. **postero-anterior:** the collimated X-ray beam (CR) passes, perpendicular to the coronal plane, from posterior to anterior

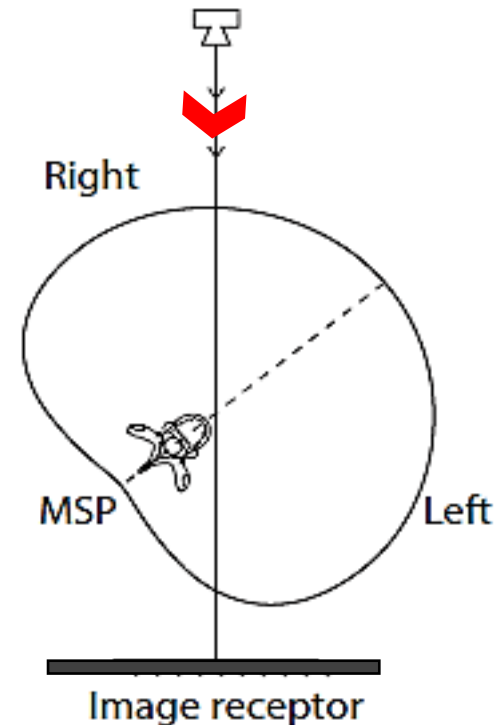


Projection Terminology

- 3. Lateral:** the collimated X-ray beam(CR) passes from one side of the body to the other along a coronal and transverse plane.
- 4. Oblique:** central ray passes through the body/body part through a plane that is at an angle to the transverse plane/coronal plane.
- 5. Axial:** central ray passes through (or parallel) to the long axis of the body.



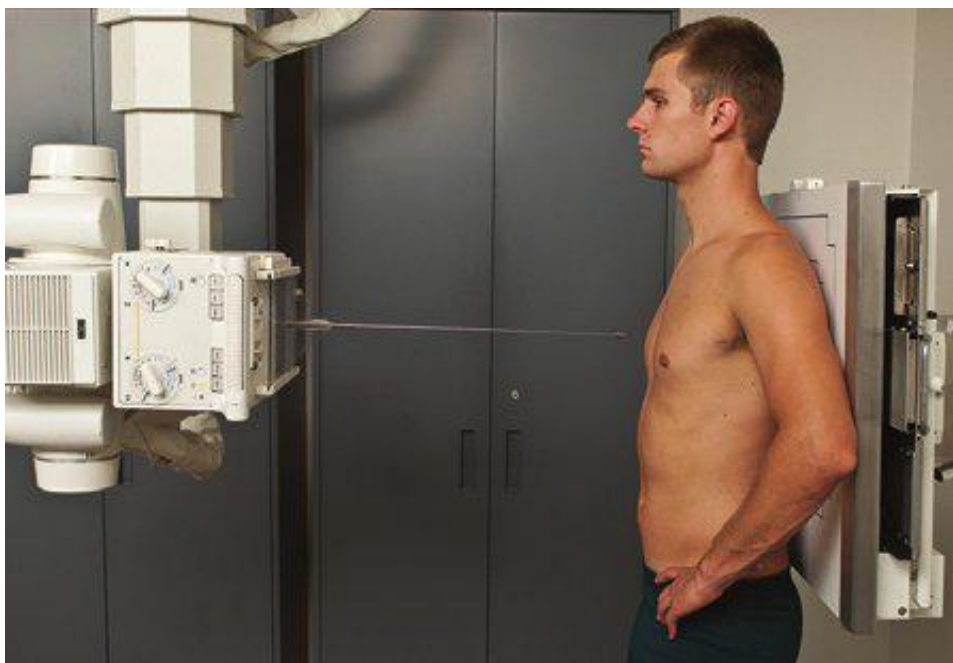
Right lateral projection



Left posterior oblique projection



Projection Terminology



AP projection
projection.



PA



Projection Terminology



Erect RAO position



Lateral position





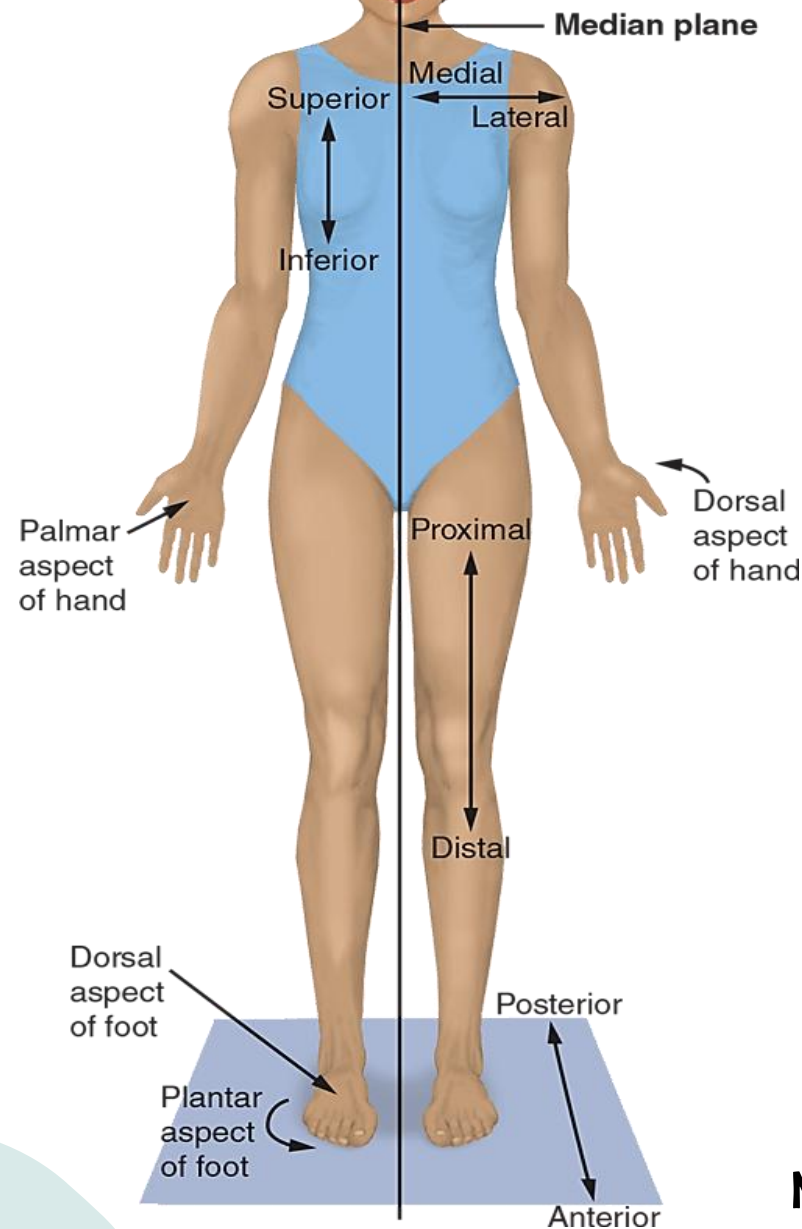
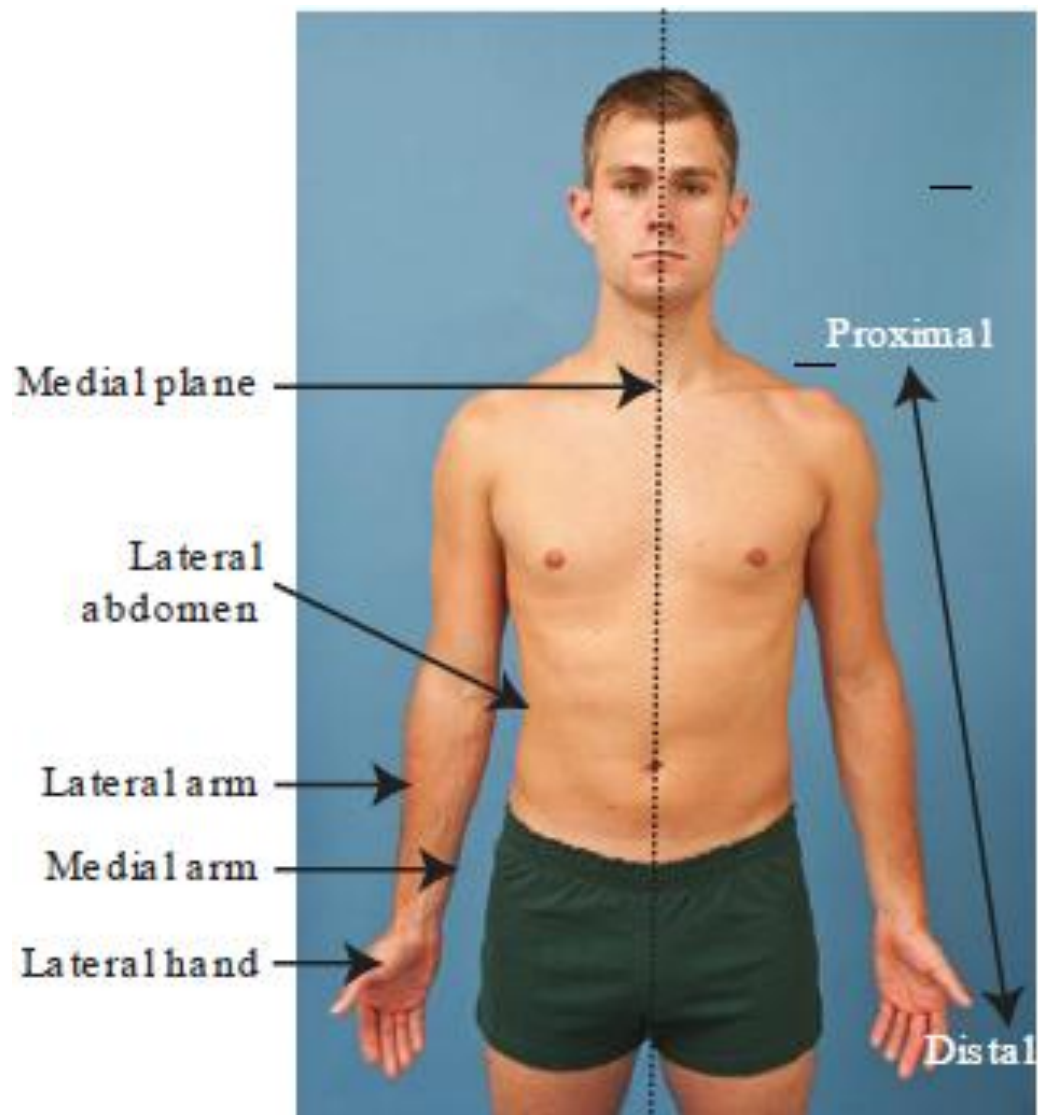
Anatomic Terms

- Medial:** body part is the part closest to the median plane.
- Lateral:** body part is away from the center.
- Proximal:** is near the beginning.
- Distal:** is away from the beginning.
- Cephalad:** superior (toward the head).
- Caudad:** inferior (toward the feet).
- Interior (Internal, Inside):** is inside of something, nearer to the center.
- Exterior (External, Outer):** is situated on the outside.
- Superficial:** is the skin surface.
- Deep** is farther away from the skin surface.





Anatomic Terms





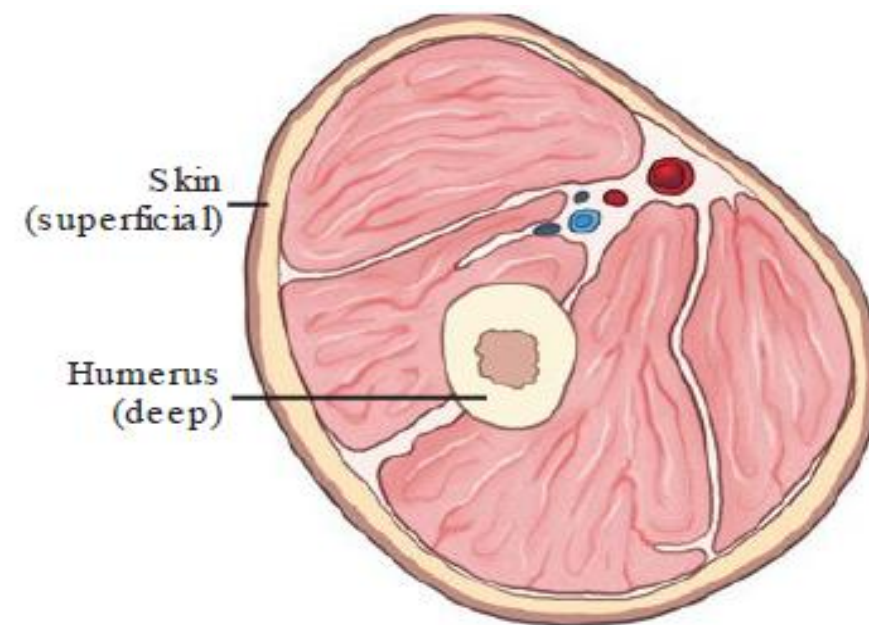
Anatomic Terms



Cephalad CR angle (toward head)

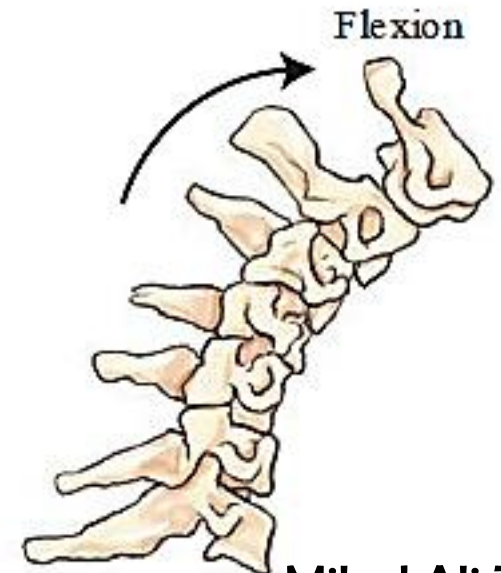
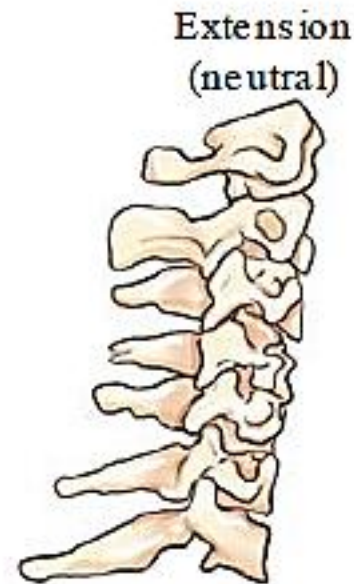
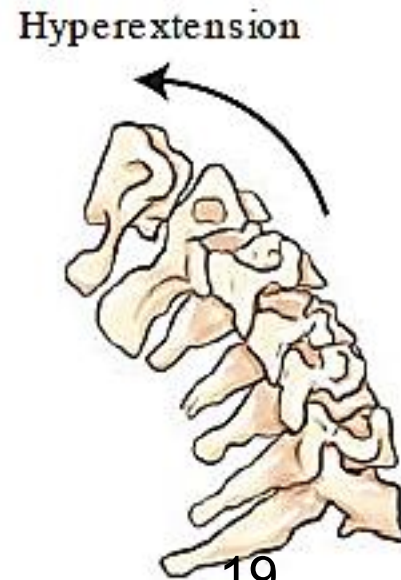


Caudad CR angle(away from head)



Terms Related to Movement

- Flexion:** increases the angle of the joint
- Extension, Hyperextension:** Extending a joint beyond the straight or neutral position.
- Flexion of Spine:** bending the spine forward.
- Extension:** returning the spine to the straight or neutral position.
- Hyperextension:** A backward bending of the spine beyond the neutral position.



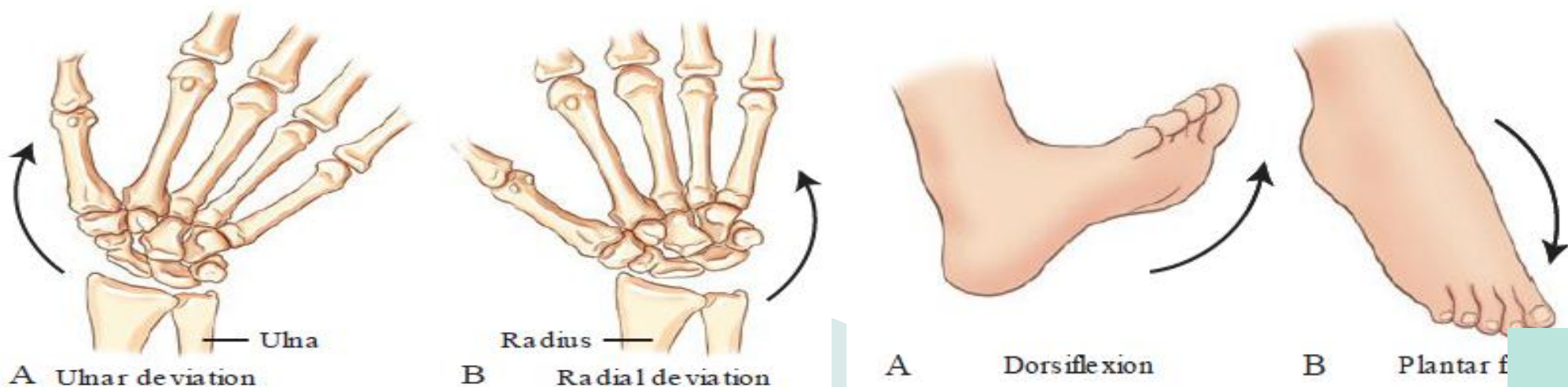
Terms Related to Movement

Ulnar Deviation of Wrist: is to turn or bend the hand and wrist from the natural position toward the ulnar side.

Radial deviation: is to turn the hand and wrist toward the radial side of the wrist.

Dorsiflexion of Foot and Ankle: decrease the angle between the dorsum(top of foot) and the lower leg, moving foot and toes upward.

Plantar Flexion of Foot: extending the ankle joint, moving foot and toes downward from the normal position; decreasing the angle toward the plantar (posterior) surface of the foot.





Terms Related to Movement

{ **Abduction:** is the lateral movement of the arm or leg away from the body.

{ **Adduction:** is a movement of the arm or leg toward the body.

{ **Supination:** is a rotational movement of the hand into the anatomic position.

{ **Pronation:** is a rotation of the hand into the opposite of the anatomic position.





Important Notes

Position: is a term that is used to indicate the patient's general **physical position**, such as supine, prone, recumbent, or erect.

Position also is used to describe specific body positions by the **body part closest to the IR.**

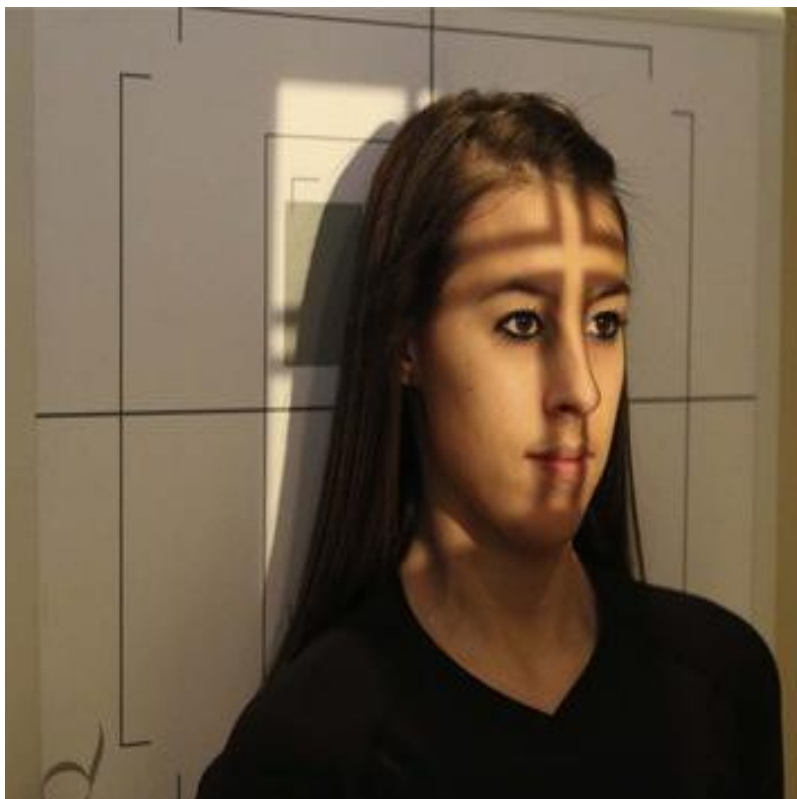
Projection: is a correct positioning term that describes or refers to the path or direction of the central ray (CR), projecting an image onto an image receptor (IR).

View: describes the body part as seen by the IR.





Important Notes





REFERENCES

- Whitley, A. S., Jefferson, G., Holmes, K., Sloane, C., Anderson, C., & Hoadley, G. (2015). Clark's Positioning in Radiography 13E. crc Press.
- Bontrager, K. L., & Lampignano, J. (2013). Bontrager's handbook of radiographic positioning and techniques. Elsevier Health Sciences.

*Thank
You*

