

Body Planes & Positions

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Learning Objectives

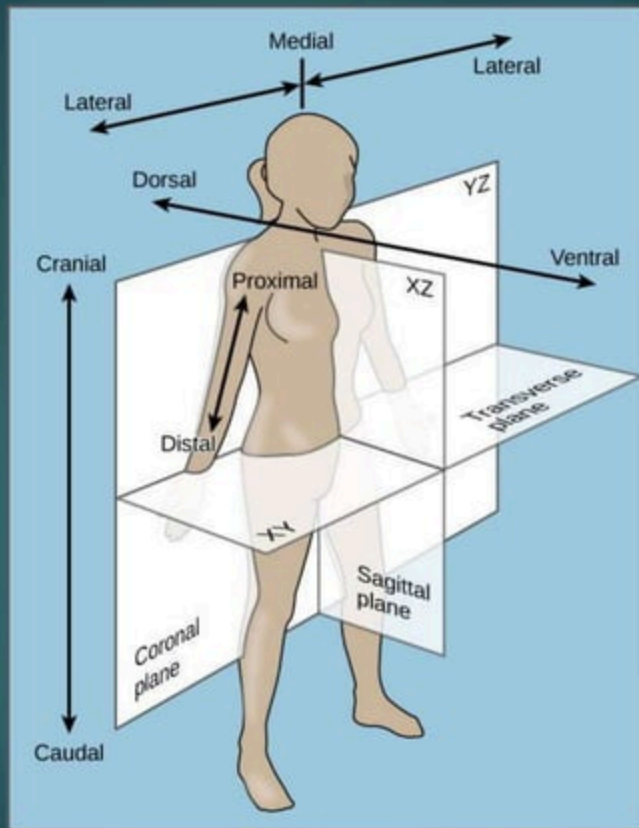
- ▶ **Objective 1:** Identify and utilize anatomical positions, planes, and directional terms.
 - Demonstrate what anatomical position is and how it is used to reference the body.
 - Distinguish between the commonly used anatomical planes and recognize their individual views.
 - Apply directional terms to their location on the human body.

- ▶ **Objective 2:** Demonstrate body movements.
 - Compare and contrast the various movements of the body and their counter-movements.
 - Compare and contrast the various movements of the foot /ankle and their counter-movements.
 - Compare and contrast the lateral movements of the wrist/hand and their counter-movements.

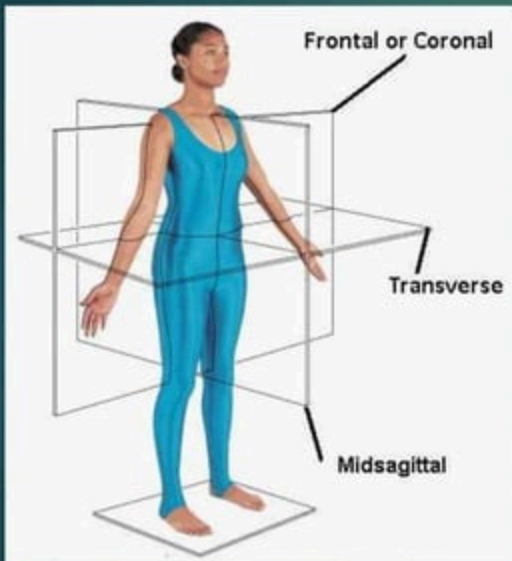
Anatomical Position

- ▶ Standing erect, with palms and feet facing forward
- ▶ Is the standard reference point in which all positions, movements, and planes are described





Anatomical Planes



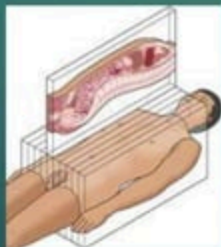
- ▶ Fixed lines of reference along which the body is often divided or sectioned to facilitate viewing of its structures
- ▶ Allow one to obtain a three-dimensional perspective by studying the body from different views

Anatomical Planes

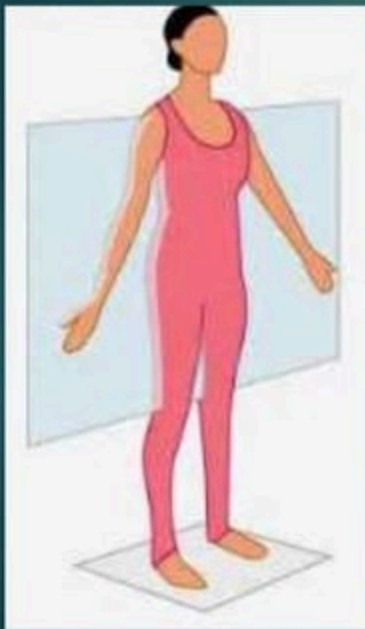


Sagittal plane

- ▶ The plane dividing the body into right and left portions
- ▶ Midsagittal or median are names for the plane dividing the body into **equal** right and left halves

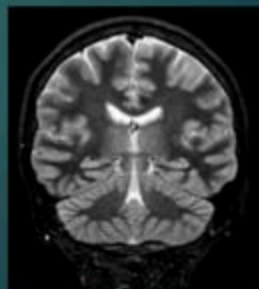
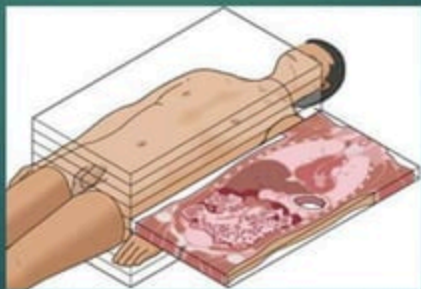


Anatomical Planes



Frontal/Coronal plane

- ▶ The plane dividing the body into **front and back** portions



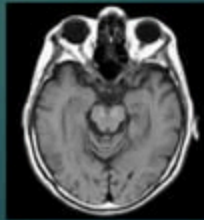
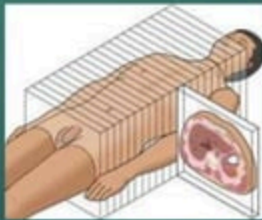
Anatomical Planes

Transverse plane



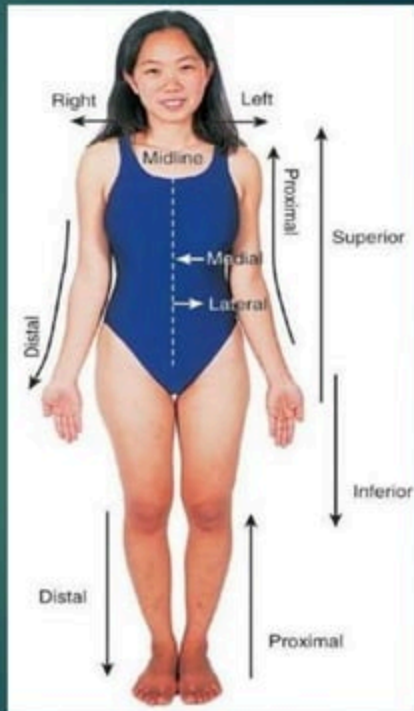
Transverse plane

- ▶ The horizontal plane dividing the body into upper and lower portions
- ▶ Also called the Horizontal plane.



Positions and Directions

Terms of position and direction describe the position of one body part relative to another, usually along one of the three major body planes



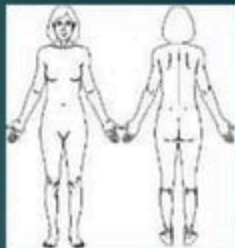
Positions and Directions

Anterior

- ▶ Refers to a structure being more in front than another structure in the body

Posterior

- ▶ Refers to a structure being more in back than another structure in the body



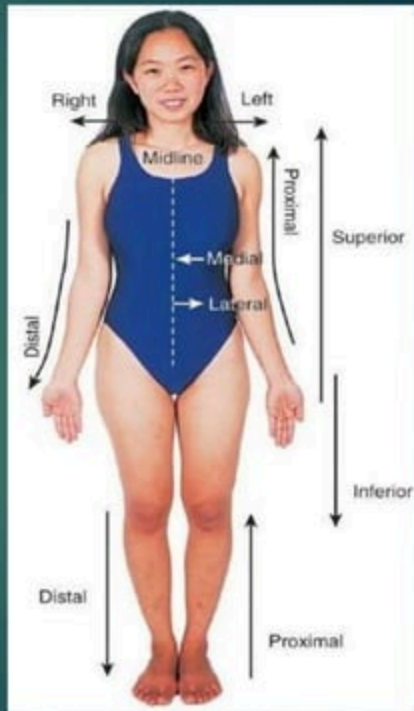
Positions and Directions

Superior

- ▶ Refers to a structure being closer to the head or higher than another structure in the body

Inferior

- ▶ Refers to a structure being closer to the feet or lower than another structure in the body



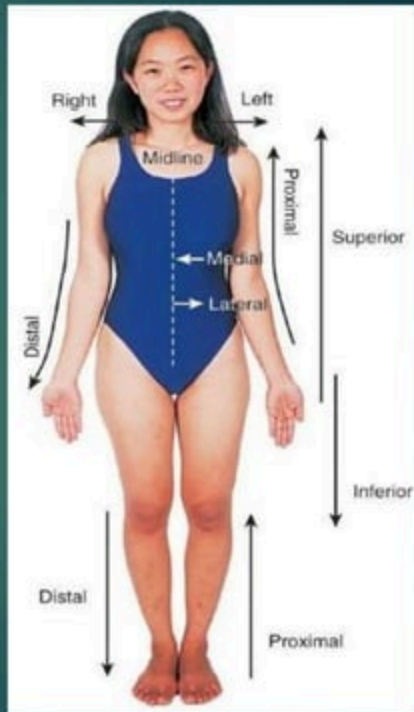
Positions and Directions

Medial

- ▶ Refers to a structure being closer to the midline or median plane of the body than another structure of the body

Lateral

- ▶ Refers to a structure being farther away from the midline than another structure of the body



Positions and Directions

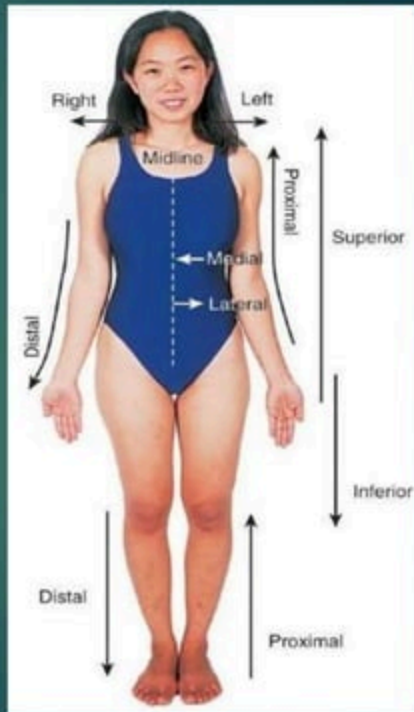
(Reference to the **extremities only**)

Distal

- ▶ Refers to a structure being further away from the **root** of the limb than another structure in the limb

Proximal

- ▶ Refers to a structure being closer to the **root** of the limb than another structure in that limb



Distal / Proximal

- ▶ When you divide the skeleton into **Axial** (Blue) and **Appendicular** (Yellow) you can better understand the extremities and their **roots**.



Positions and Directions

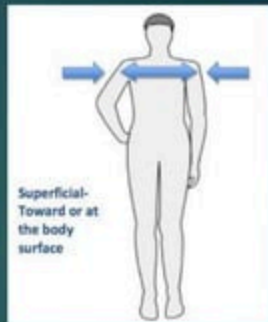
- ▶ **Cranial/Cephalic:** towards the head
- ▶ **Caudal:** towards the tail



Positions and Directions

Superficial

- ▶ Refers to a structure being closer to the surface of the body than another structure



Deep

- ▶ Refers to a structure being closer to the core of the body than another structure



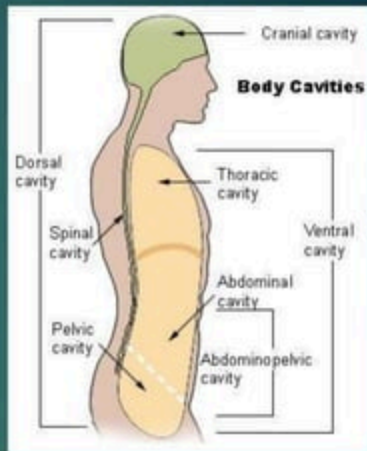
Positions and Directions

Ventral

- ▶ Towards the front or belly

Dorsal

- ▶ Towards the back



Positions and Directions

Prone

- ▶ Lying face down



Supine

- ▶ Lying face up



Unilateral

- ▶ Pertaining to one side of the body

Bilateral

- ▶ Pertaining to both sides of the body

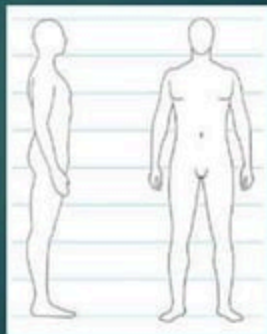
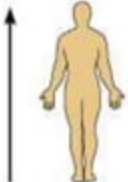
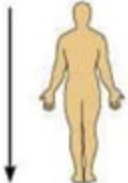


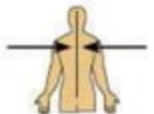


TABLE 1.1

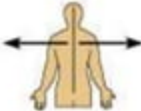





Orientation and Directional Terms

Term	Definition	Example
Superior (cranial)	Toward the head end or upper part of a structure or the body; above	 <p>The head is superior to the abdomen</p>
Inferior (caudal)	Away from the head end or toward the lower part of a structure or the body; below	 <p>The navel is inferior to the chin</p>
Anterior (ventral)*	Toward or at the front of the body; in front of	 <p>The breastbone is anterior to the spine</p>
Posterior (dorsal)*	Toward or at the back of the body; behind	 <p>The heart is posterior to the breastbone</p>
Medial	Toward or at the midline of the body; on the inner side of	 <p>The heart is medial to the arm</p>

*Whereas the terms ventral and anterior are synonymous in humans, this is not the case in four-legged animals. Ventral specifically refers to the "belly" of a vertebrate animal and thus is the inferior surface of four-legged animals. Likewise, although the dorsal and posterior surfaces are the same in humans, the term dorsal specifically refers to an animal's back. Thus, the dorsal surface of four-legged animals is their superior surface.

TABLE 1.1

Orientation and Directional Terms

Term	Definition	Example	
Lateral	Away from the midline of the body; on the outer side of		The arms are lateral to the chest
Intermediate	Between a more medial and a more lateral structure		The collarbone is intermediate between the breastbone and shoulder
Proximal	Closer to the origin of the body part or the point of attachment of a limb to the body trunk		The elbow is proximal to the wrist
Distal	Farther from the origin of a body part or the point of attachment of a limb to the body trunk		The knee is distal to the thigh
Superficial (external)	Toward or at the body surface		The skin is superficial to the skeletal muscles
Deep (internal)	Away from the body surface; more internal		The lungs are deep to the skin



Flexion

Extension

Lateral flexion

Rotation

Forward rotation

Backward rotation

Elevation

Depression



Flexion



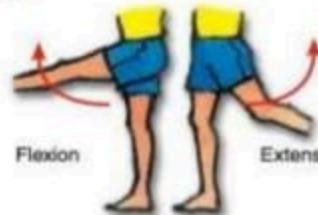
Extension



Abduction

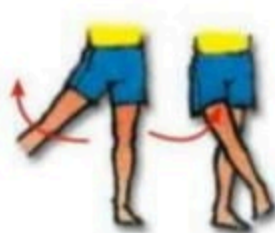


Adduction



Flexion

Extension



Abduction



Adduction



External rotation



Internal rotation



Flexion



Extension

Dorsi flexion



Inversion

Plantar flexion

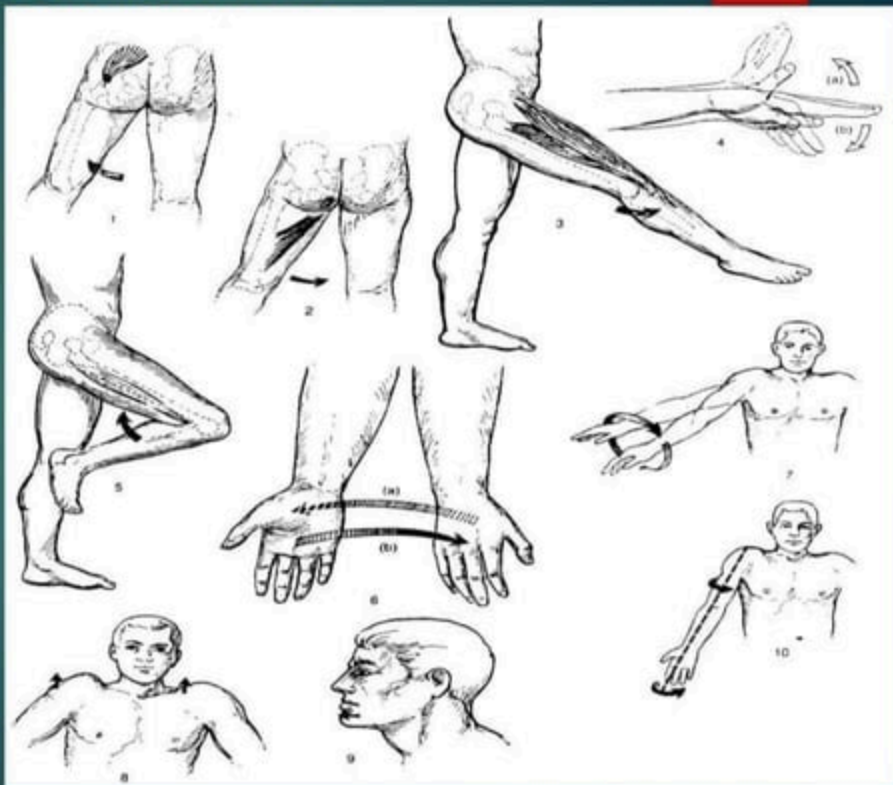


Eversion

Body Movements

Body Movements

- ▶ Flexion
- ▶ Extension
- ▶ Hyperextension
- ▶ Adduction
- ▶ Abduction
- ▶ Pronation
- ▶ Supination
- ▶ Retraction
- ▶ Protraction
- ▶ Elevation
- ▶ Depression
- ▶ Rotation
- ▶ Circumduction
- ▶ External Rotation
- ▶ Internal Rotation
- ▶ Inversion
- ▶ Eversion
- ▶ Dorsiflexion
- ▶ Plantarflexion
- ▶ Radial Deviation
- ▶ Ulnar Deviation
- ▶ Opposition



Movements

Flexion

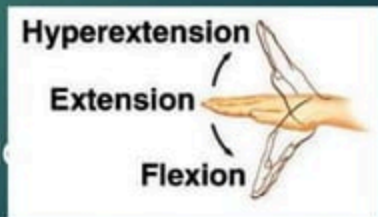
- ▶ Bending a joint or decreasing the angle between two bones

Extension

- ▶ Straightening a joint or increasing the angle between two bones

Hyperextension

- ▶ Excessive extension of the joint at a joint beyond its normal anatomic range



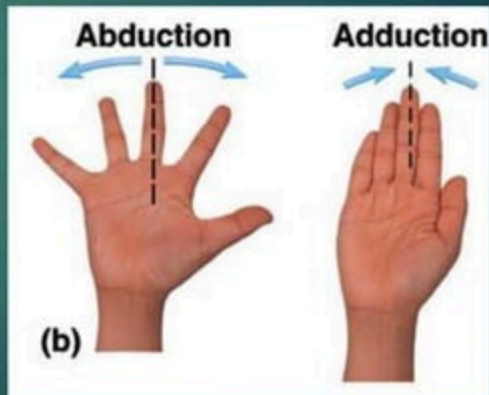
Movements

Adduction

- ▶ Moving a body part towards the midline of the body

Abduction

- ▶ Moving a body part from the midline of the body



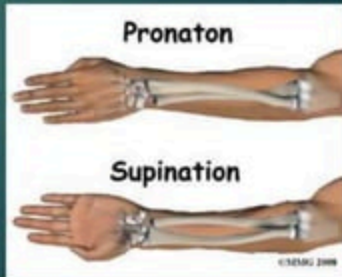
Movements

Pronation

- ▶ Turning the arm or foot downward; (palm or sole of the foot - down)

Supination

- ▶ Turning the arm or foot upward; (palm or sole of the foot - up)



Movements

Retraction

- ▶ Moving a part backward

Protraction

- ▶ Moving a part forward

Elevation

- ▶ Raising a part

Depression

- ▶ Lowering a part



Movements

Rotation

- ▶ Turning on a single axis

Circumduction

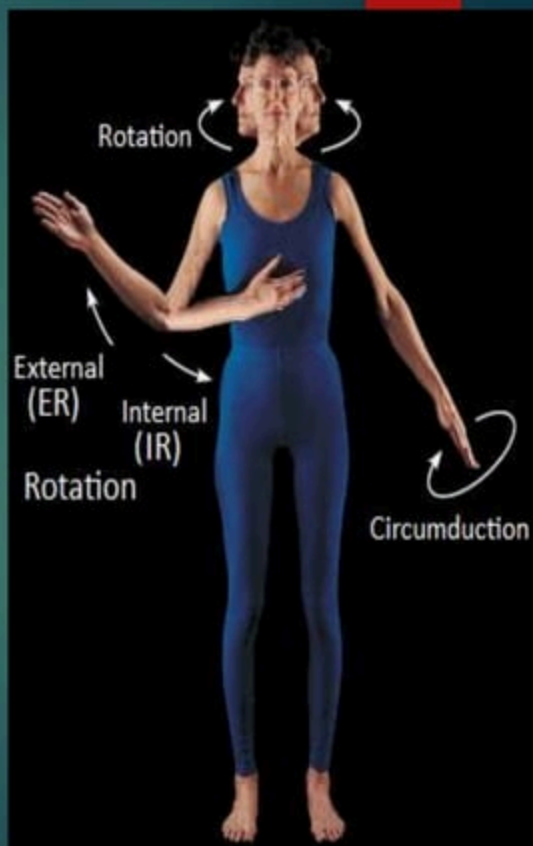
- ▶ Tri-planar, circular motion at the hip or shoulder

External rotation

- ▶ Rotation of the hip or shoulder away from the midline

Internal rotation

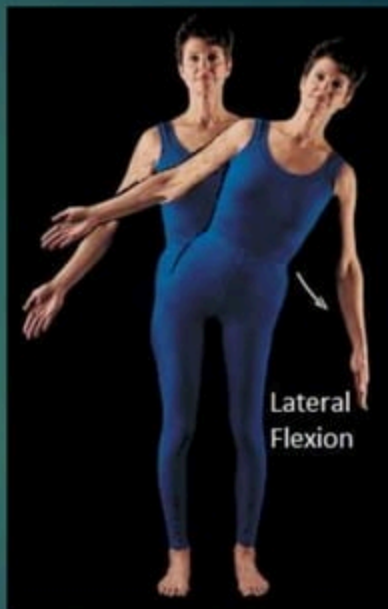
- ▶ Rotation of the hip or shoulder toward the midline



Movements

Lateral Flexion

- ▶ Side-bending left or right



Movements of the Foot

Inversion

- ▶ Turning the sole of the foot inward

Eversion

- ▶ Turning the sole of the foot outward

Dorsiflexion

- ▶ Ankle movement bringing the foot towards the shin

Plantarflexion

- ▶ Ankle movement pointing the foot downward



Movements of the Wrist & Thumb

Radial Deviation

- ▶ Movement of the wrist towards the radius or lateral side.

Ulnar Deviation

- ▶ Movement of the wrist towards the ulna or medial side.

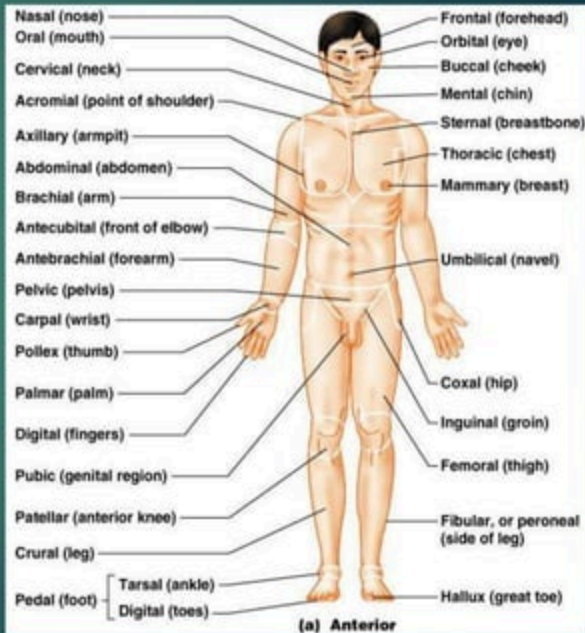
Opposition

- ▶ Movement of the thumb across the palm of the hand.

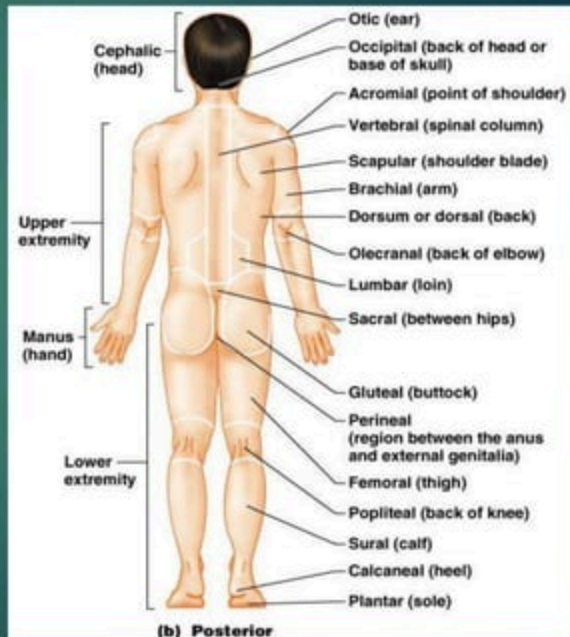


Regional Terms: Anterior View

- ▶ **Axial** – head, neck, and trunk
- ▶ **Appendicular** – appendages or limbs
- ▶ **Specific regional terminology**



Regional Terms: Posterior View





▶ **THANK YOU**