Al- Mustaqbal College University
Department Of Medical Instrumentation
Techniques Engineering
Anatomy and Physiology

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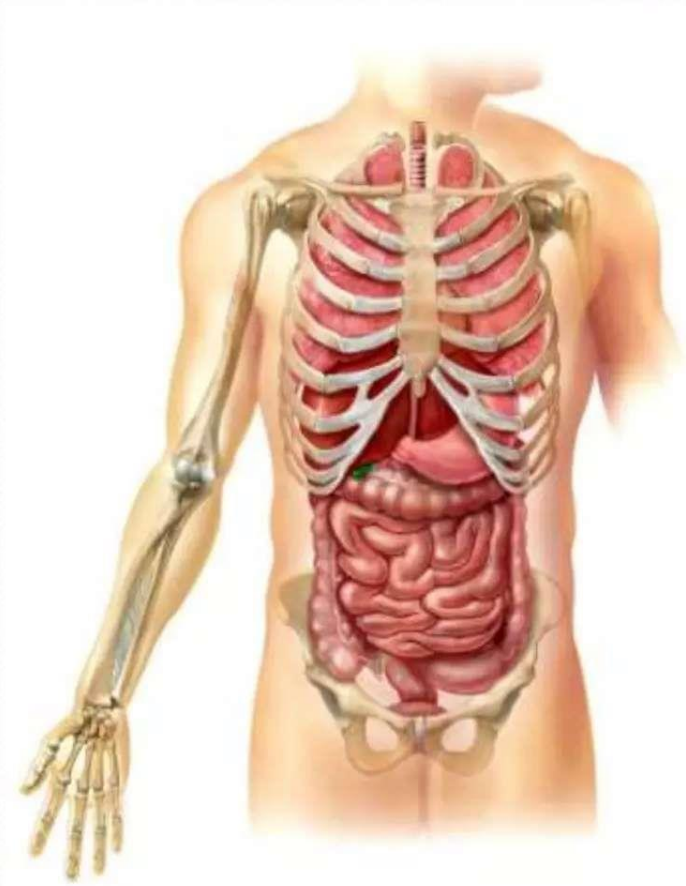
Introduction to anatomy and physiology

Anatomy and Physiology

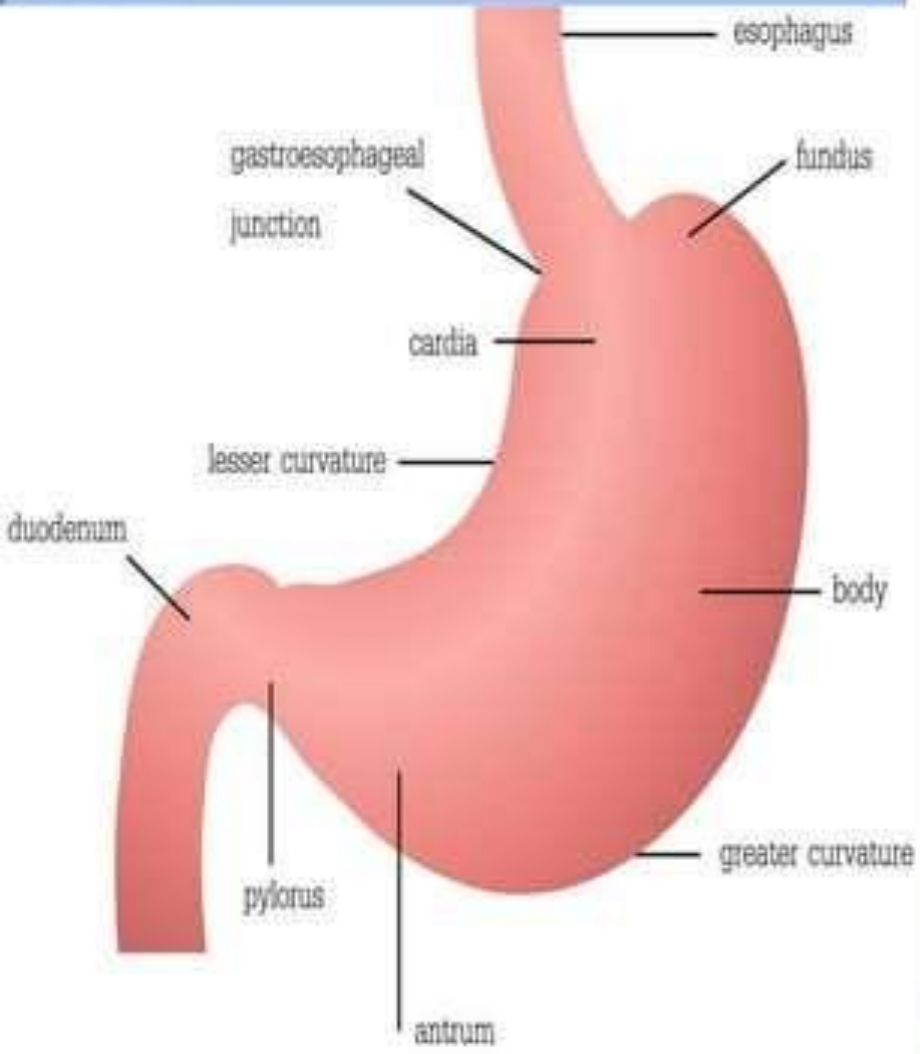
- Anatomy is the study of body structure.
  - science of structure

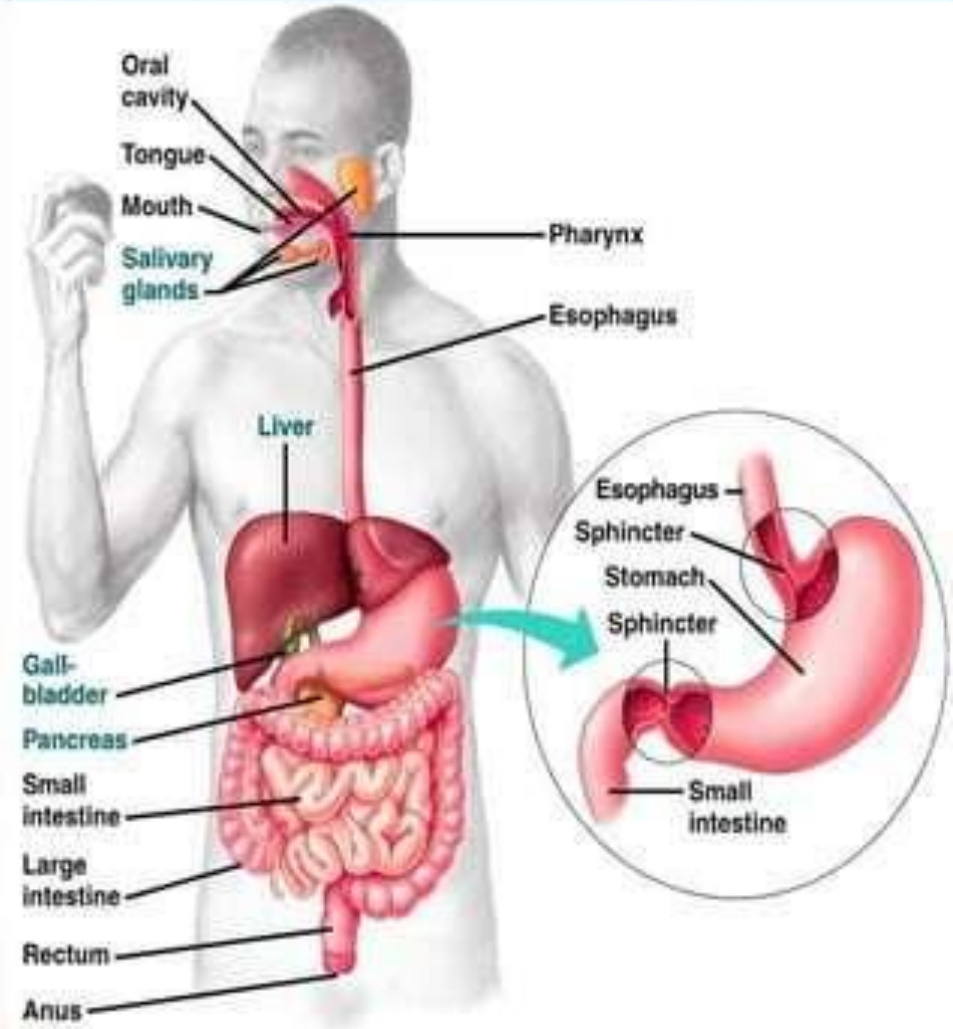
- Physiology is the science of body functions.
  - science of body functions

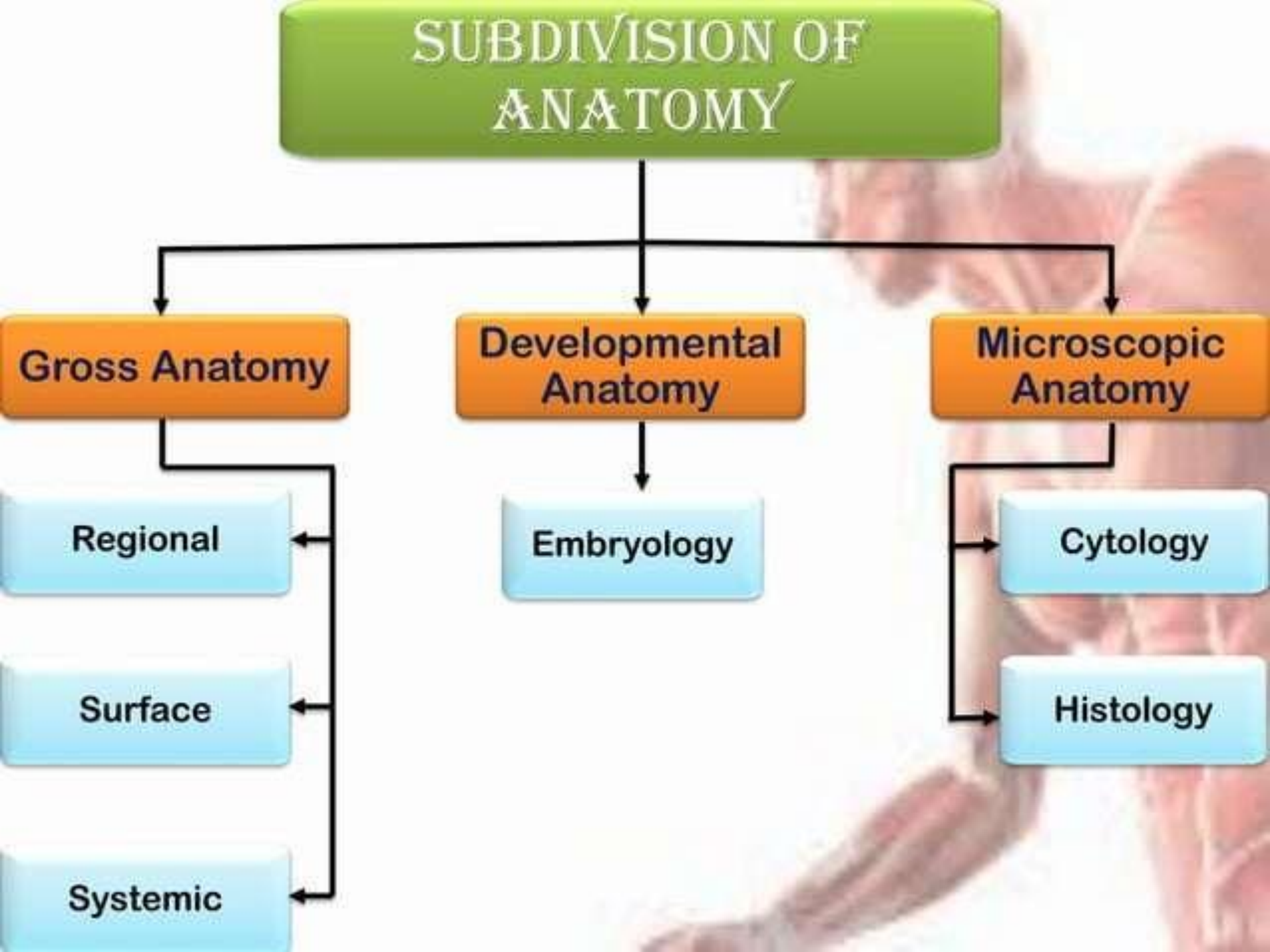


Anatomy: The study of the structure(Stomach) and identity of the parts of the stomach

Physiology: The study of how these parts of stomach is carrying out it's function and relate to one another






SUBDIVISION OF ANATOMY
Gross Anatomy
Developmental Anatomy
Microscopic Anatomy
Regional
Surface
Systemic
Embryology
Cytology
Histology

Subdivisions of Anatomy

- **Surface Anatomy** is the study of form and markings of the body surface, often explored through visualization or palpation (without any "cutting").
- **Gross Anatomy** is the study of anatomical structures visible to unaided eye. After making the appropriate surface marking in the prior picture, the gross dissection proceeds through "cutting."

Subdivisions of Anatomy

- **Gross Anatomy can be studied by two general approaches:**
  - **Systemic** approach (Systemic Anatomy):
  - **Regional** approach (Regional Anatomy)

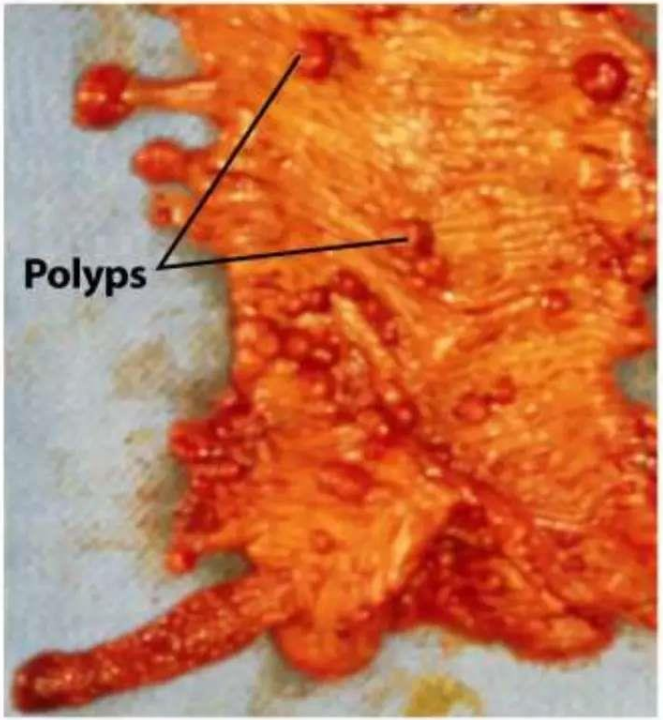
Subdivisions of Anatomy

- **Developmental anatomy**

  is the study of the fertilized egg developing into its adult form.(For e.g., Embryology)

Subdivisions of Anatomy

- **Histology** is the study of **tissues**.
- **Cytology**, like histology, uses a microscope, but restricts the study to individual **cellular structures** .
- **Pathology** is the study of anatomical changes due to **disease** .



Courtesy of Randall W. Burt

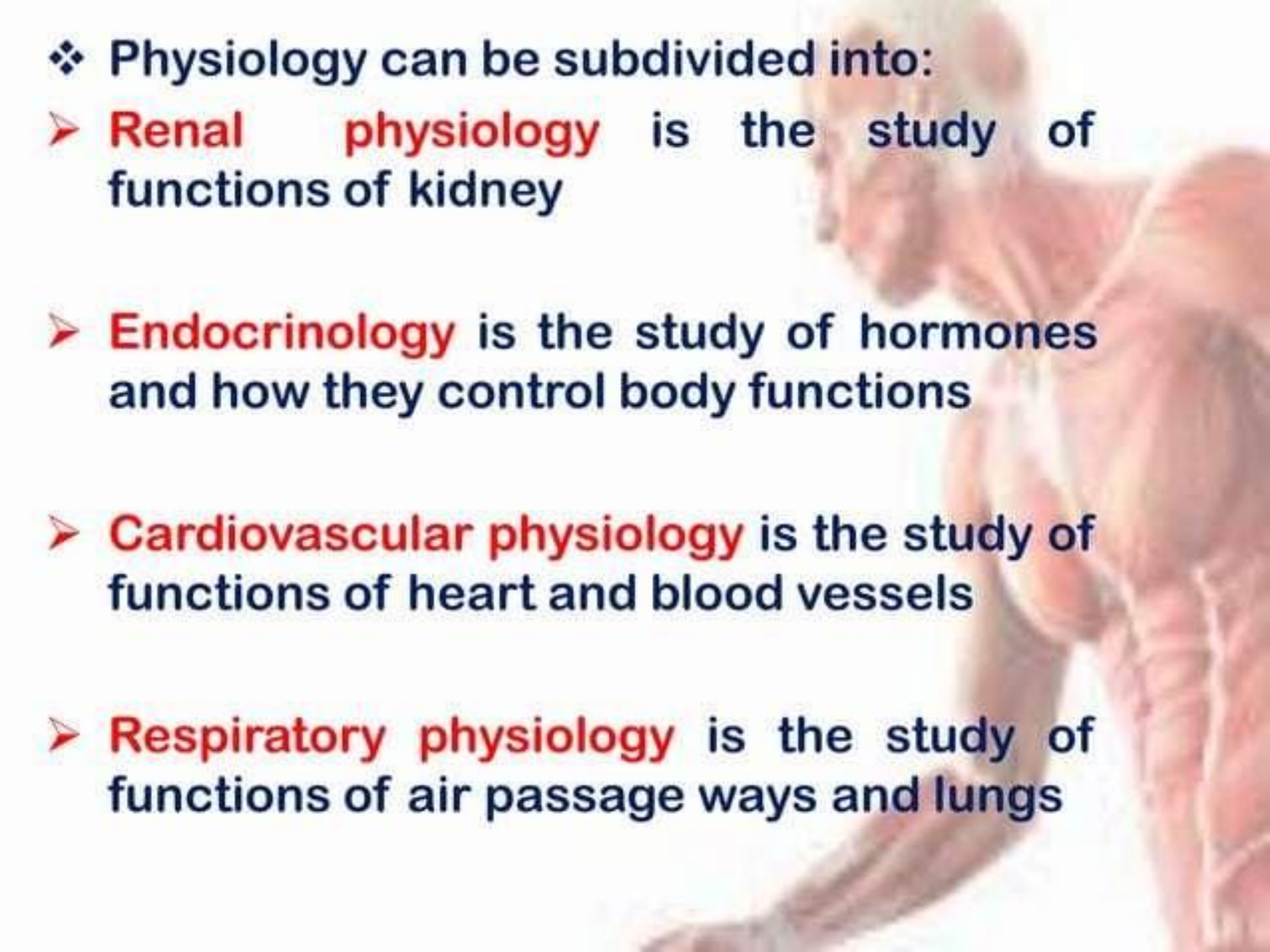
❖ Physiology can be subdivided into:

- **Renal physiology** is the study of functions of kidney

- **Endocrinology** is the study of hormones and how they control body functions

- **Cardiovascular physiology** is the study of functions of heart and blood vessels

- **Respiratory physiology** is the study of functions of air passage ways and lungs



- **Neurophysiology** is the study of functional properties of nerve cells

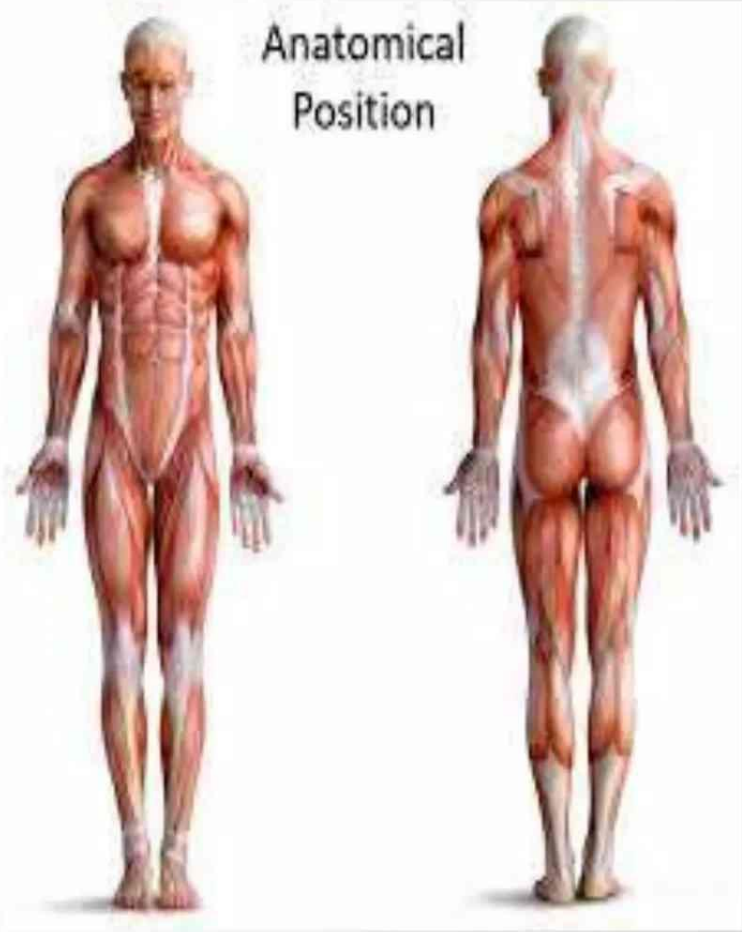
- **Cell physiology** is the study of functions of cell

- **Pathophysiology** is the study of functional changes associated with disease and aging

- **Exercise physiology** is the study of changes in the cells and organ function during muscular activity

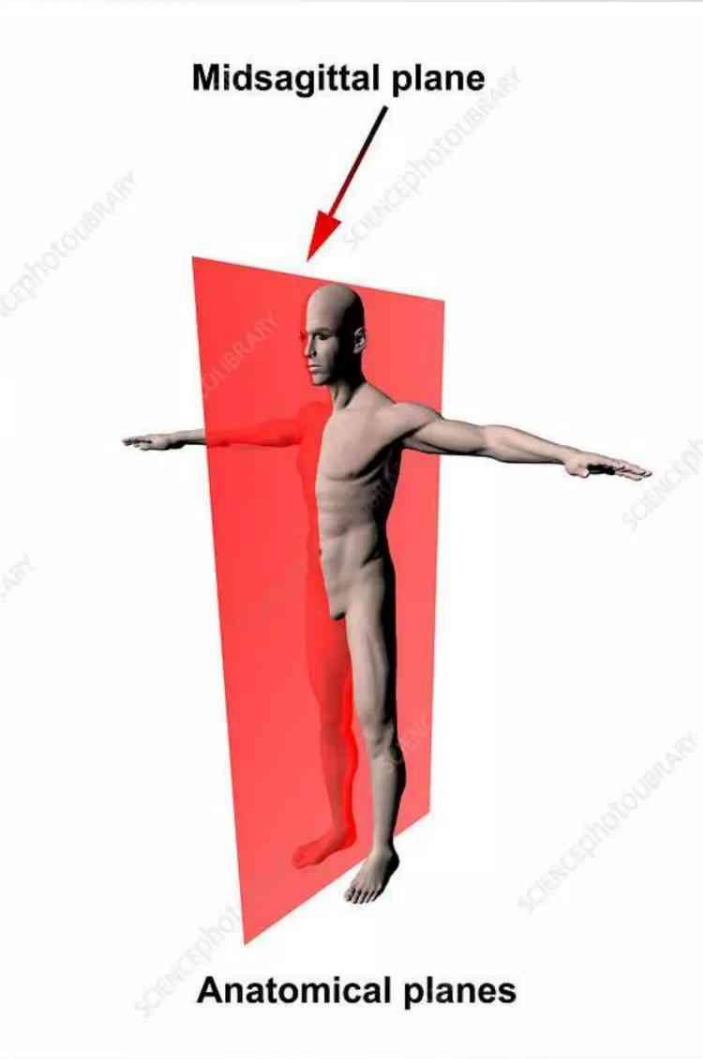
ANATOMICAL POSITION

- Standing up right
- Looking straight towards horizon
- Upper limbs hanging by the side of body
- Palms facing forwards
- Lower limbs are parallel with toes pointing forwards



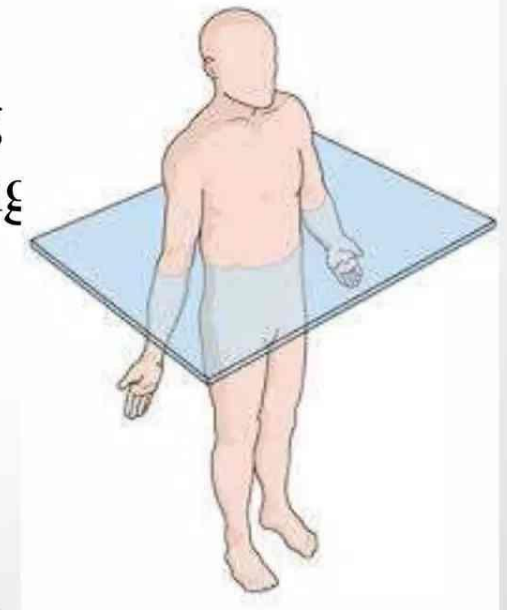
BODY PLANES

- A plane is an imaginary surface that slices the body into specific sections.
- **MID SAGITTAL (Median Plane)**
  A vertical plane dividing the body into right and left equal halves.
- **SAGITTAL:**
  A vertical plane which is parallel to the sagittal plane.



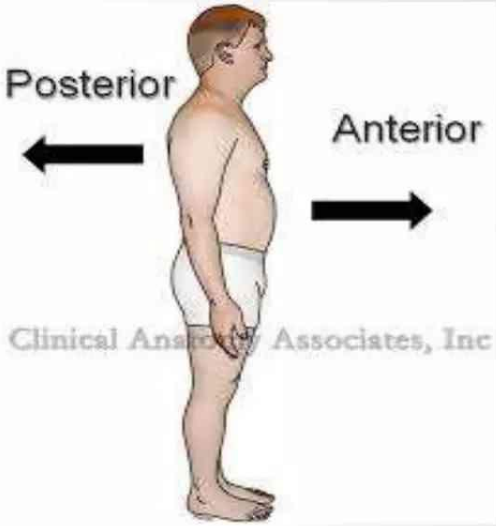
- **CORONAL PLANE**
  coronal / frontal / vertical
  plane that divides the body into anterior (front) and posterior (back) parts.

- **TRANSVERSE PLANE:**
  cross-sectional/ horizontal plane , cuts perpendicularly along the long axis of the body or organ separating it into both superior (upper) and inferior (lower) parts



ANATOMICAL TERMS OF DIRECTION

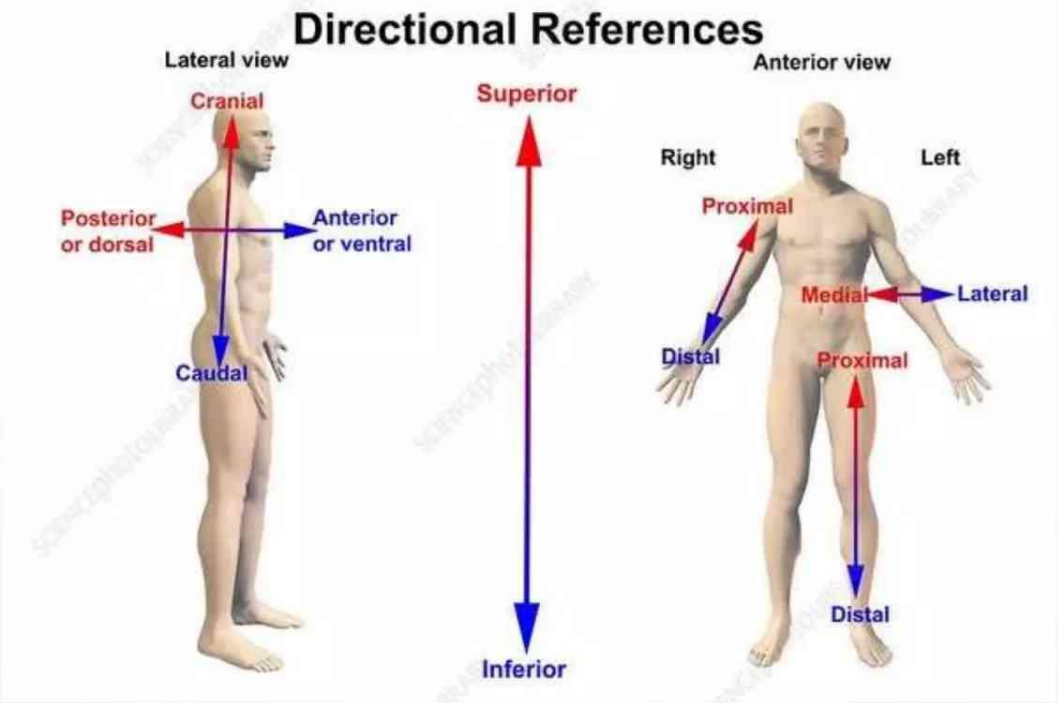
- **Anterior** = Ventral
- **Intermediate** = Middle
- **Posterior** = Dorsal



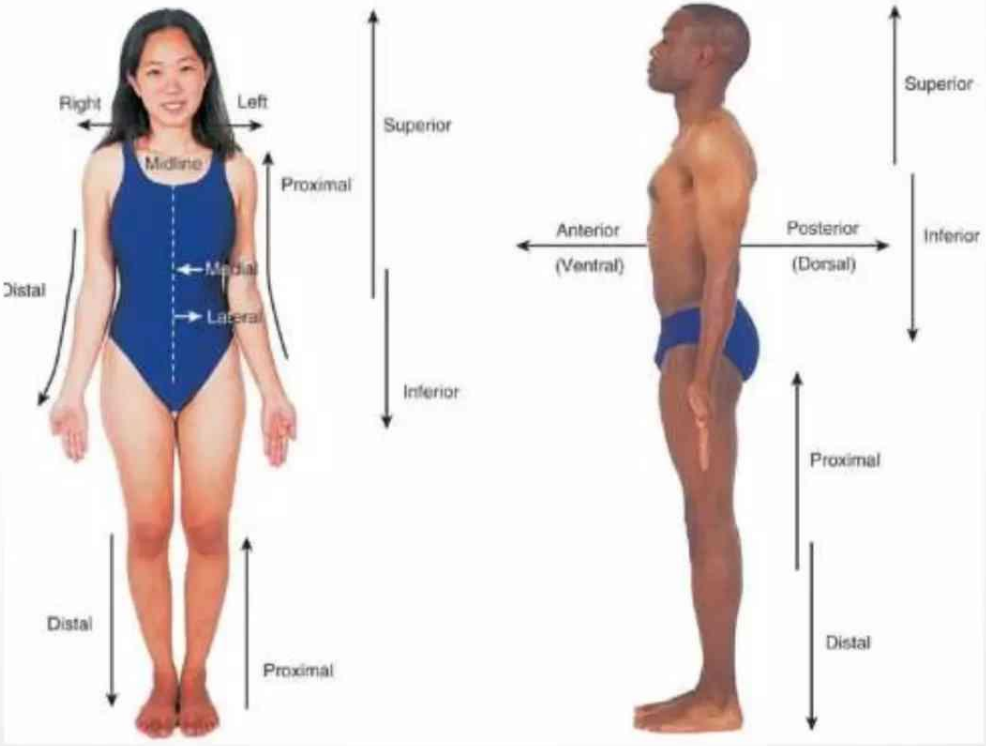
ANATOMICAL TERMS OF DIRECTION

- **Anterior** = **In front of**; toward the front surface
- **Posterior** = **In back of**; toward the back surface
- **Dorsal** = At the back side of the human body
- **Ventral** = At the belly side of the human body

- **Superior / Cranial / Cephalic** = Toward the head or above the head end
- **Inferior / Caudal** = Toward feet OR tail end.



- **Proximal** = **Closest** to point of attachment to trunk
- **Distal** = **Furthest** from point of attachment to trunk



- **Anterior**- At or **near the front** of the body (front view)
- **Posterior** -At or **near the back** of the body (back view)
- **Midline**- An imaginary vertical line that **divides the body equally** (right down the middle)
- **Lateral**- **Farther from midline** (side view)
- **Medial** -**Nearer to midline** (side view)

For solid organs:

- - Superficial -Deep

For hollow organs:

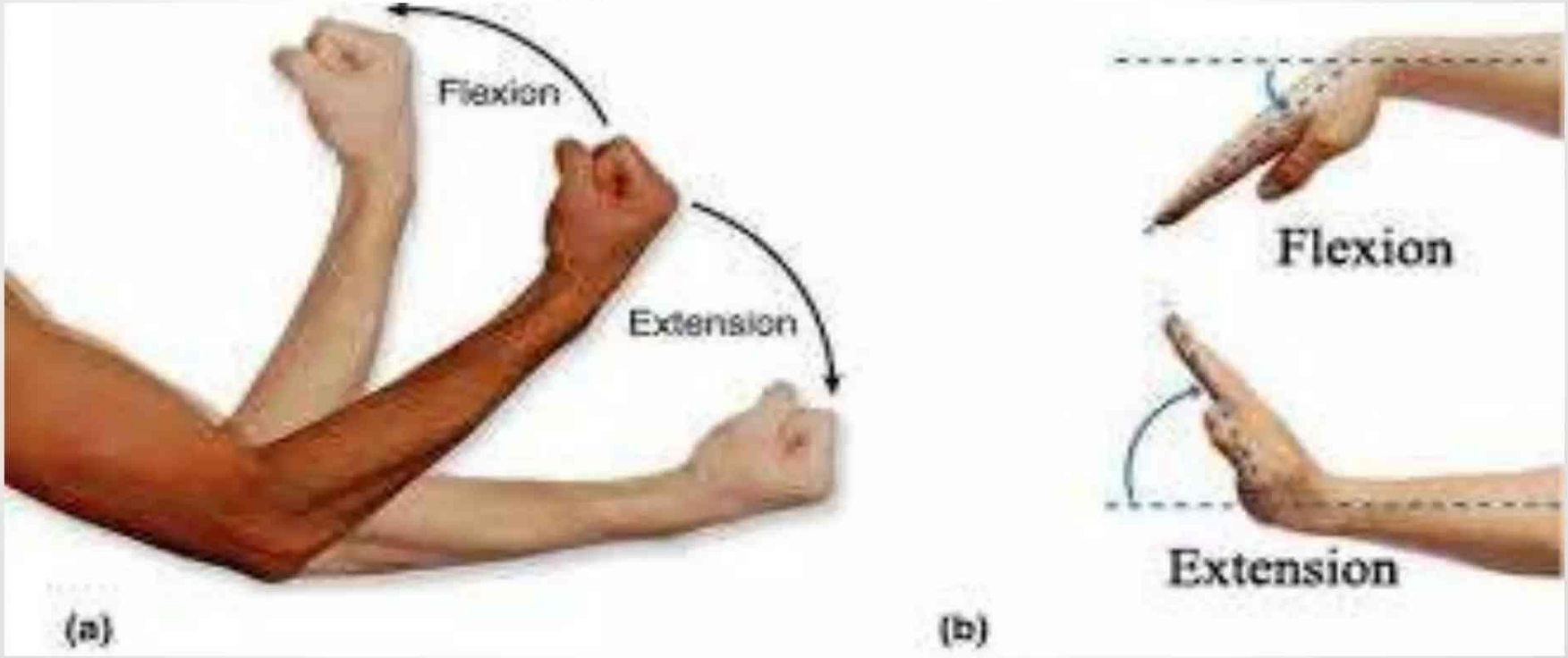
- -Interior -Exterior

For indicating the side:

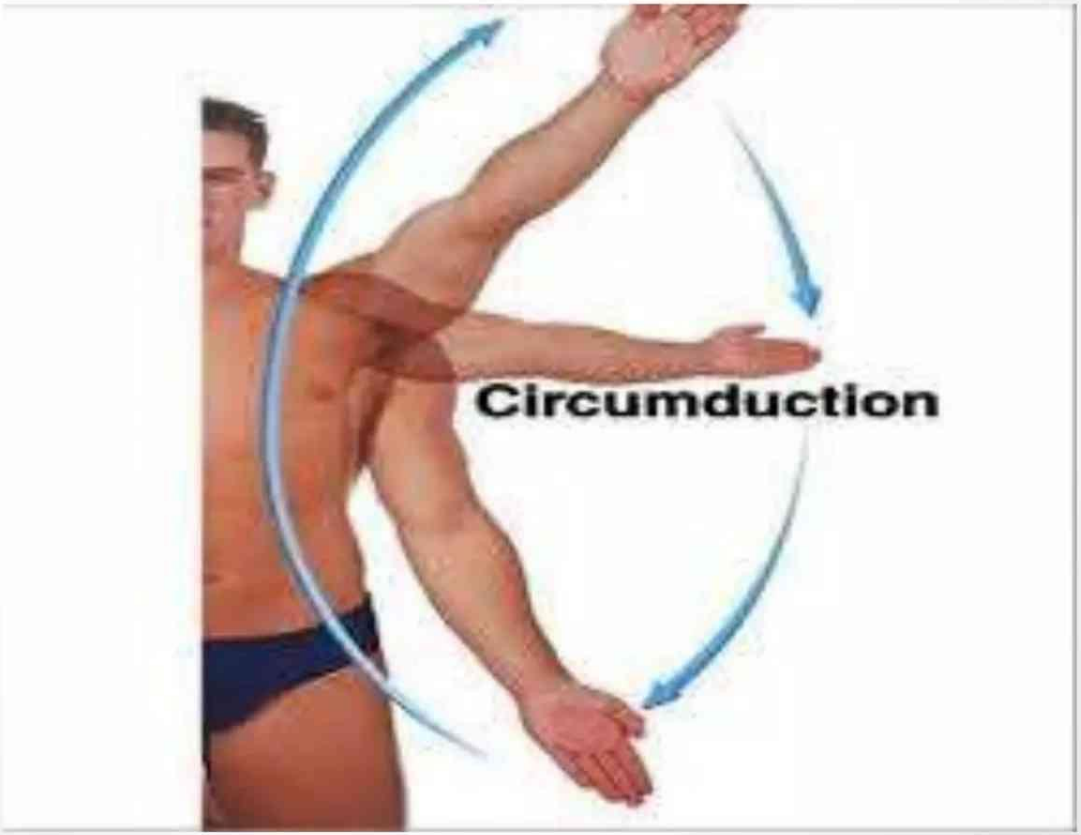
- -Ipsilateral -Contralateral

TERMS OF MOVEMENT

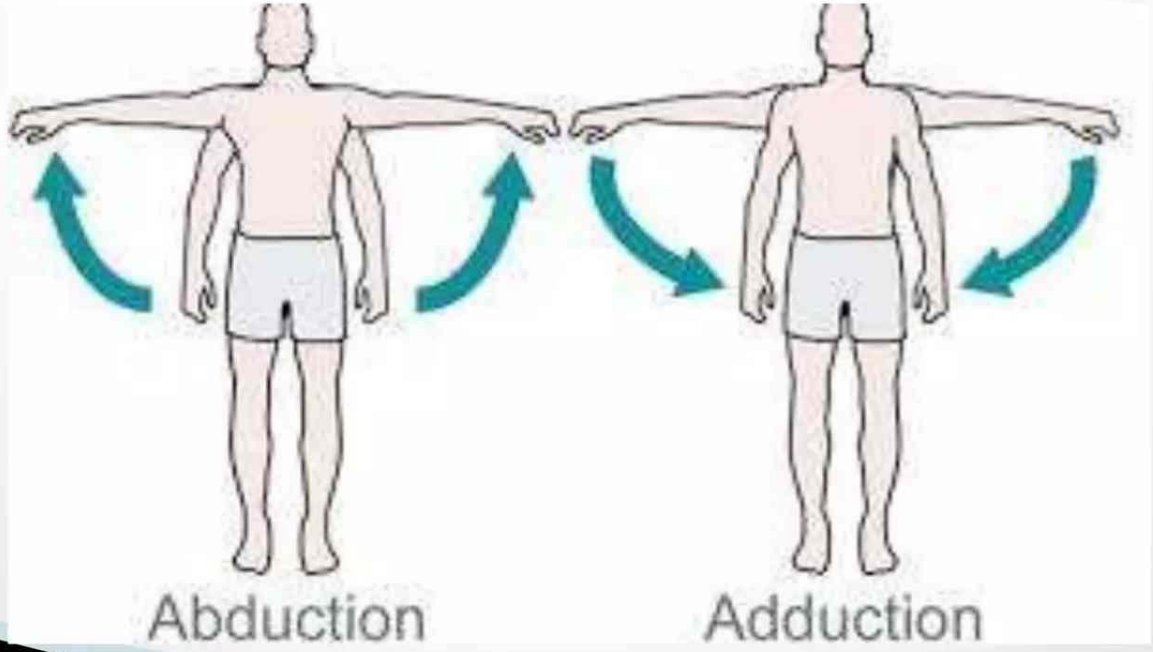
- **Flexion**: - Moving part is carried **forwards** -
- **Extension**- Moving part is carried **backwards**.



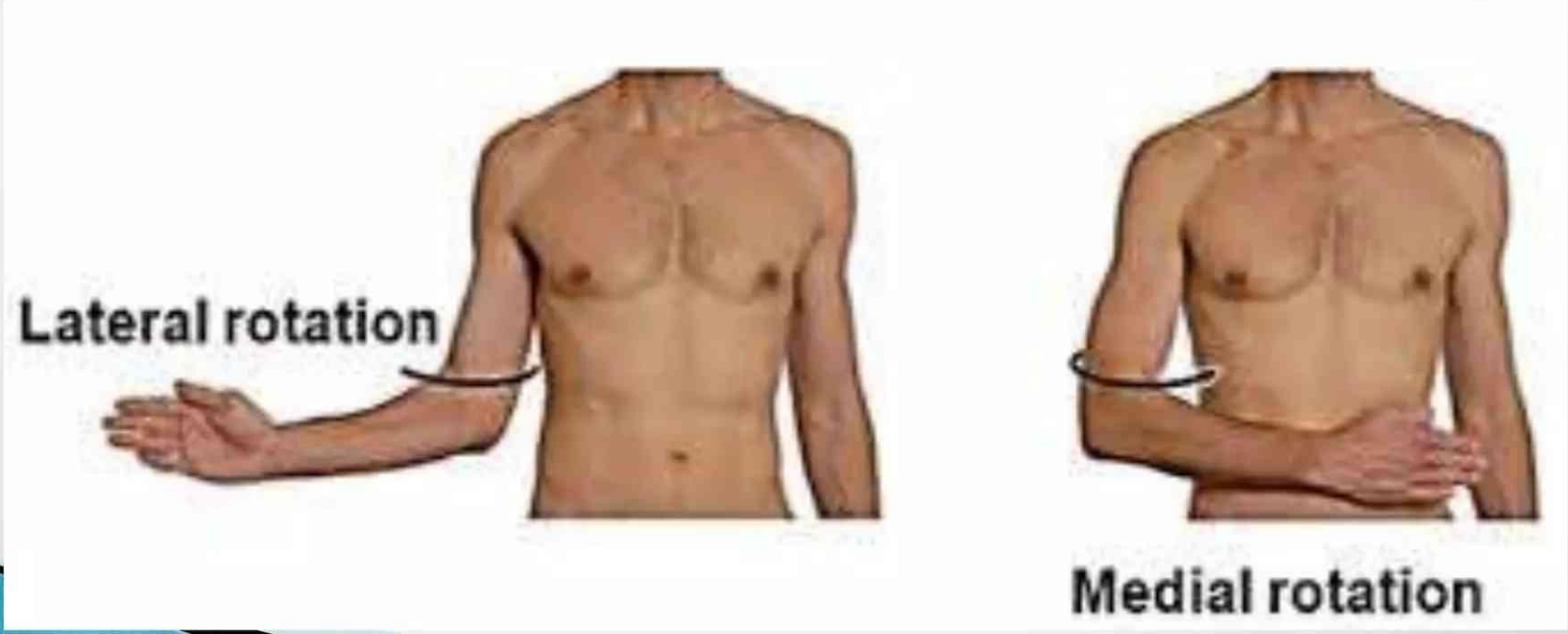
- **Circumduction:** Moving part forms the base.



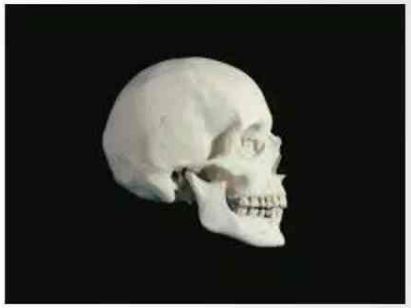
- **Abduction**: - Moving part is carried **away from the body/ reference line**.
- **Adduction:** - Moving part is carried t**owards the body / reference line.**



- **Medial Rotation** – -Moving part is **rotated towards the mid line.**
- **Lateral Rotation** – - Moving part is **rotated away from the mid line.**



TERMS OF POSITION

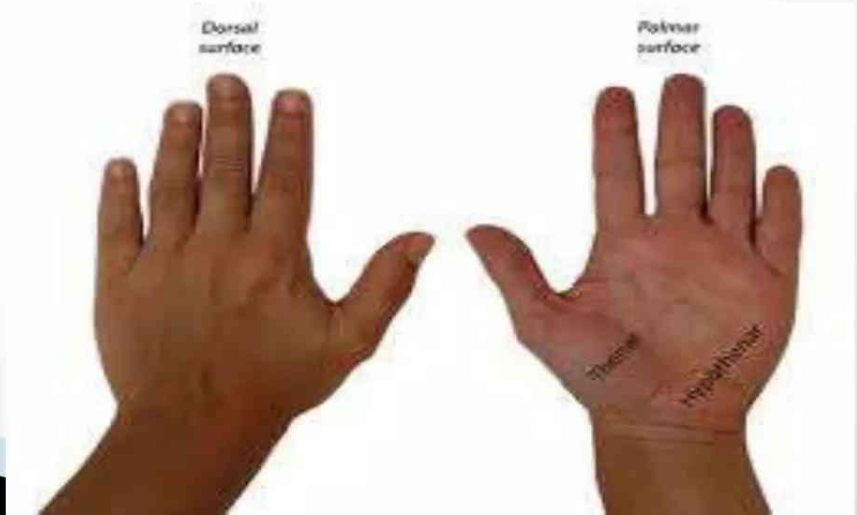


Skull

- Inferior surface is called as Base

Hand

- - Posterior surface - Dorsum of Hand
- Anterior surface - Palmar surface



Foot

- - Superior surface - Dorsum of Foot
- - Inferior Surface - Plantar Surface

TERMS OF MOVEMENT

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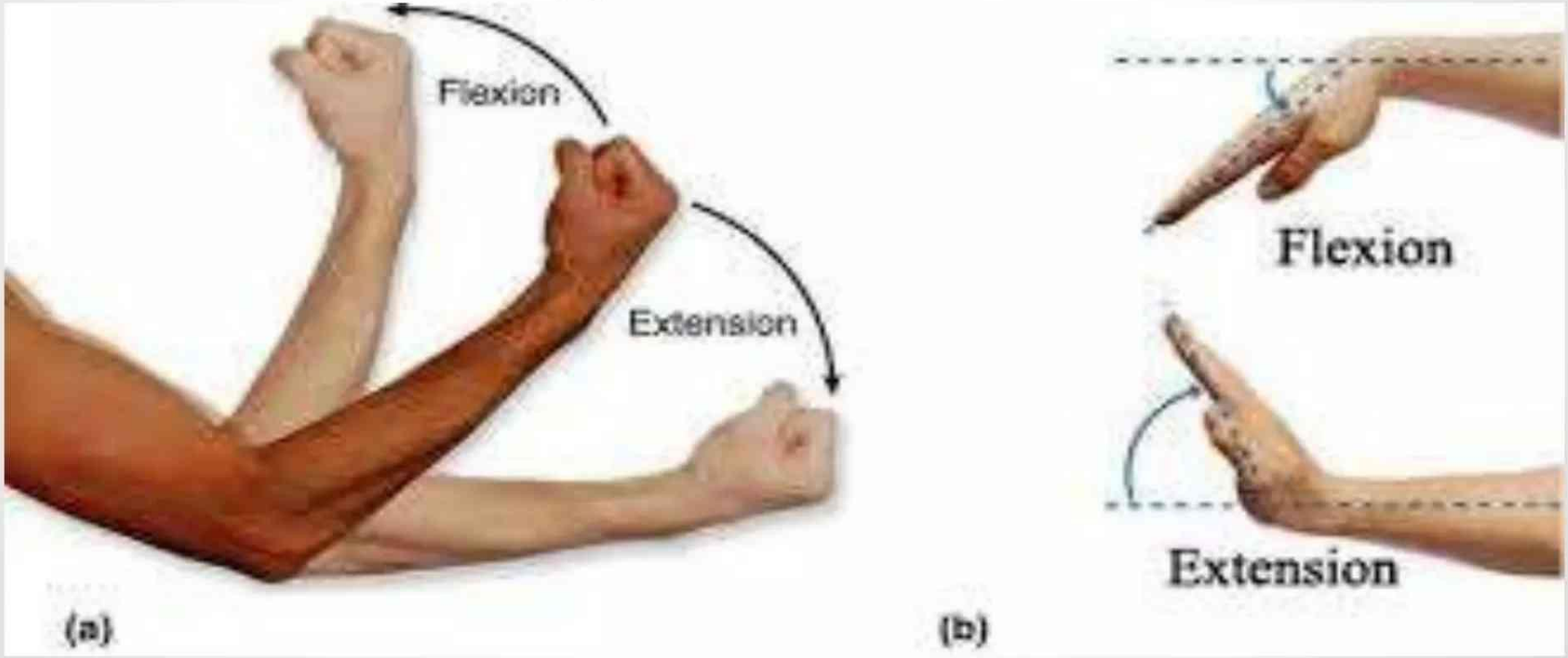
- **Extension**- Moving part is carried **backwards**.



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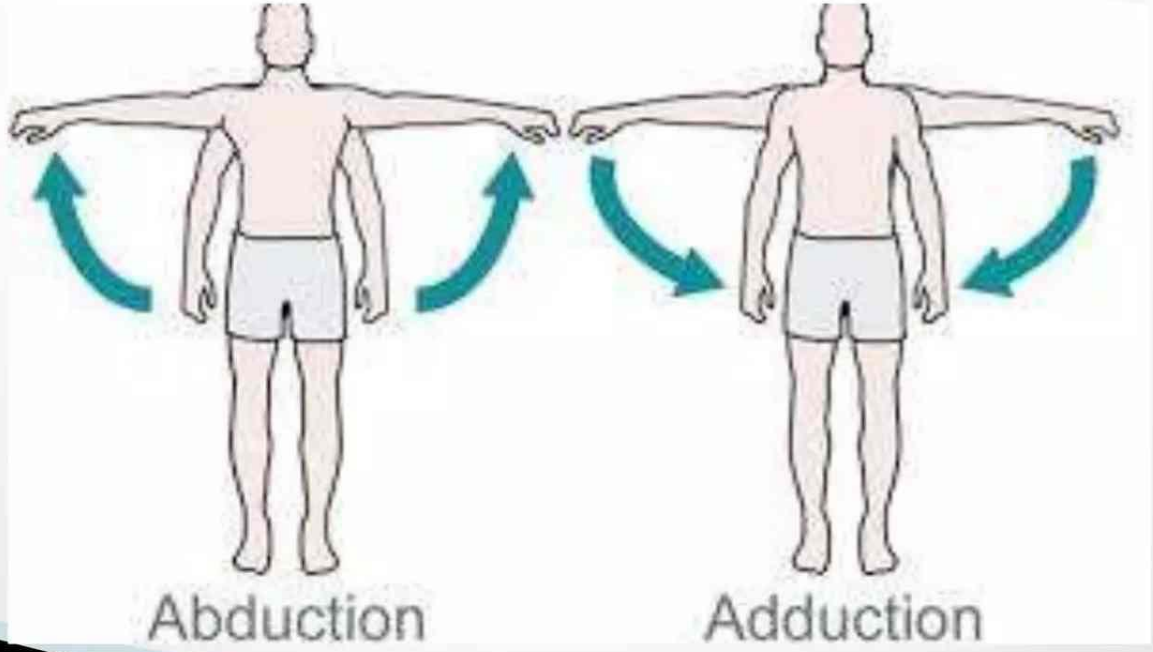
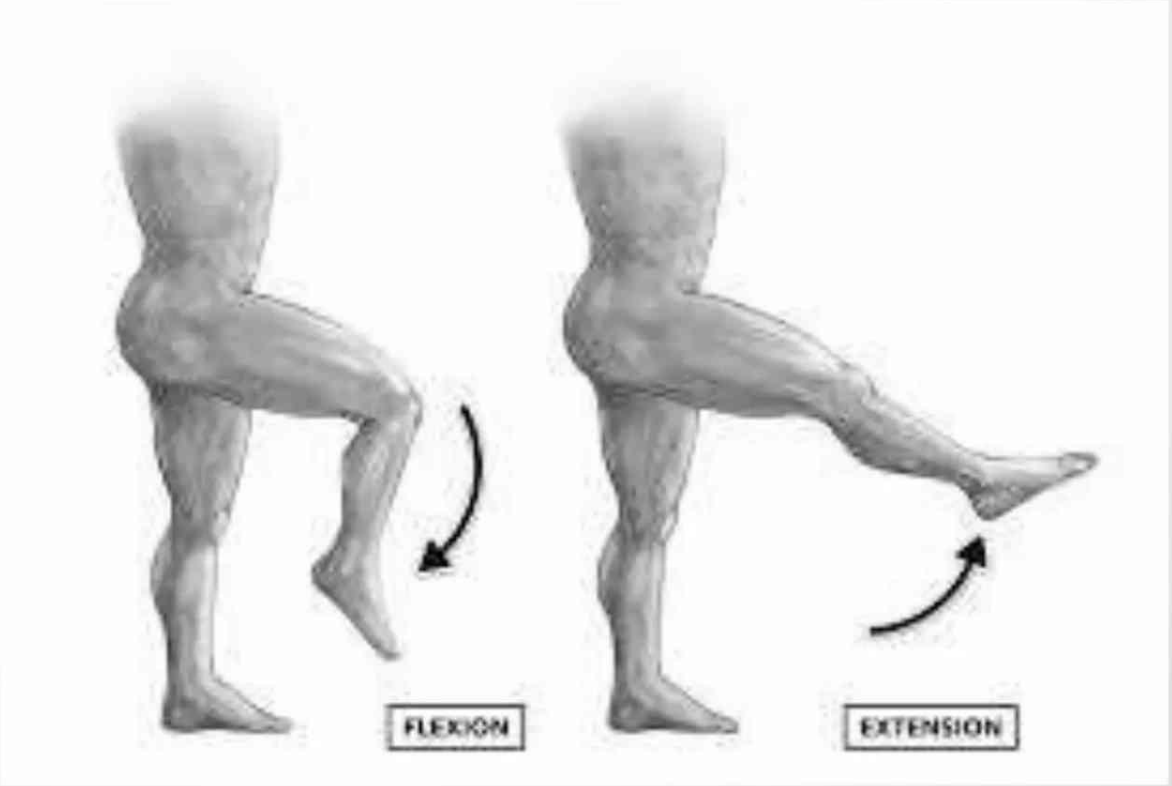


LEG:

- **Flexion** – A movement on knee joint in which **leg is carried backwards.**
- **Extension** – A movement on knee joint in which **leg is carried forwards.**



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