

# *Anatomical Terminology*

**Assoc Prof Dr Mohamad Aris Mohd Moklas (PhD)**  
**Department of Human Anatomy**  
**FMHS, UPM**  
[aris@upm.edu.my](mailto:aris@upm.edu.my)

❖ *What is anatomy?*

**Typically, when used by itself, the term ‘anatomy’ tends to mean gross or macroscopic anatomy;**

**- the study of structure of the body that can be seen without using a microscope.**

**Anatomy forms the basis for the practice of medicine.**

**Gross anatomy can be studied following either a regional or a systemic approach.**

# Subdisciplines of Anatomy

- **Gross anatomy = macroscopic anatomy**
- **Histology = microscopic anatomy**
- **Embryology = developmental anatomy**
- **Neuroanatomy**

***Regional approach:***

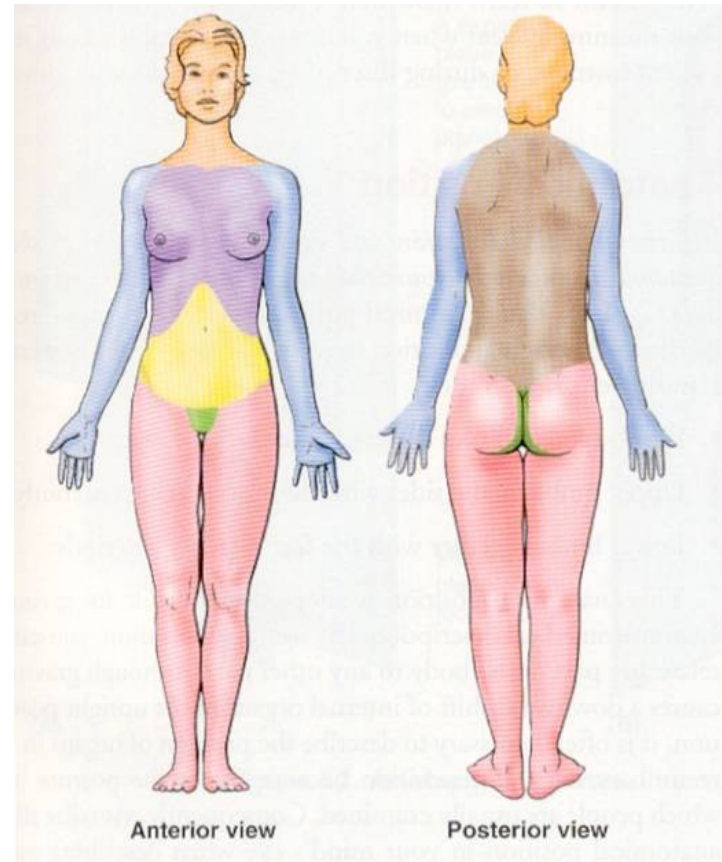
**– Each region of the body is studied separately and all aspects of that region are studied at the same time.**

***Systemic approach:***

**– Each system of the body is studied and followed throughout the entire body.**

# *Regional Anatomy*

- **Head & Neck**
- **Limbs**
  - **Upper Limbs**
  - **Lower Limbs**
- **Trunk**
  - **Thorax & Back**
  - **Abdomen**
  - **Perineum & Pelvis**



# *Systemic Anatomy*

- **Skeletal System (Osteology)**
- **Articular System (Arthrology / Syndesmology)**
- **Muscular System ( Myology)**
- **Nervous System ( Neurology )**
- **Circulatory System ( Angiology )**
- **Gastrointestinal System ( Gastroenterology )**
- **Respiratory System ( Pulmonology )**
- **Urinary System ( Urology )**
- **Reproductive System ( Gynecology + Andrology )**
- **Endocrine System ( Endocrinology )**
- **Integumentary System ( Dermatology)**

# *Clinical anatomy*

**Clinical anatomy is the study of the macroscopic structure and function of the body as it relates to the practice of medicine and other health sciences.**

# *Surface Anatomy*

- **Surface projection of deeper structure is studied**
- **Is a method of studying living anatomy or anatomy in action**
- **A mental picture of the important structure of the body forms the basis of physical examination**
- **Palpation an important technique of physical exam. Is based on the knowledge of surface anatomy**



## *Anatomical terminology;*

- Anatomy and medicine have an international vocabulary.
- To describe the body clearly and to indicate the position of it's parts and organs relative to each other, anatomists around the world have agreed to use the same descriptive terms of position and direction.
- All anatomical descriptions are expressed in relation to the anatomical position to ensure that descriptions are not ambiguous.

## *Anatomical position:*

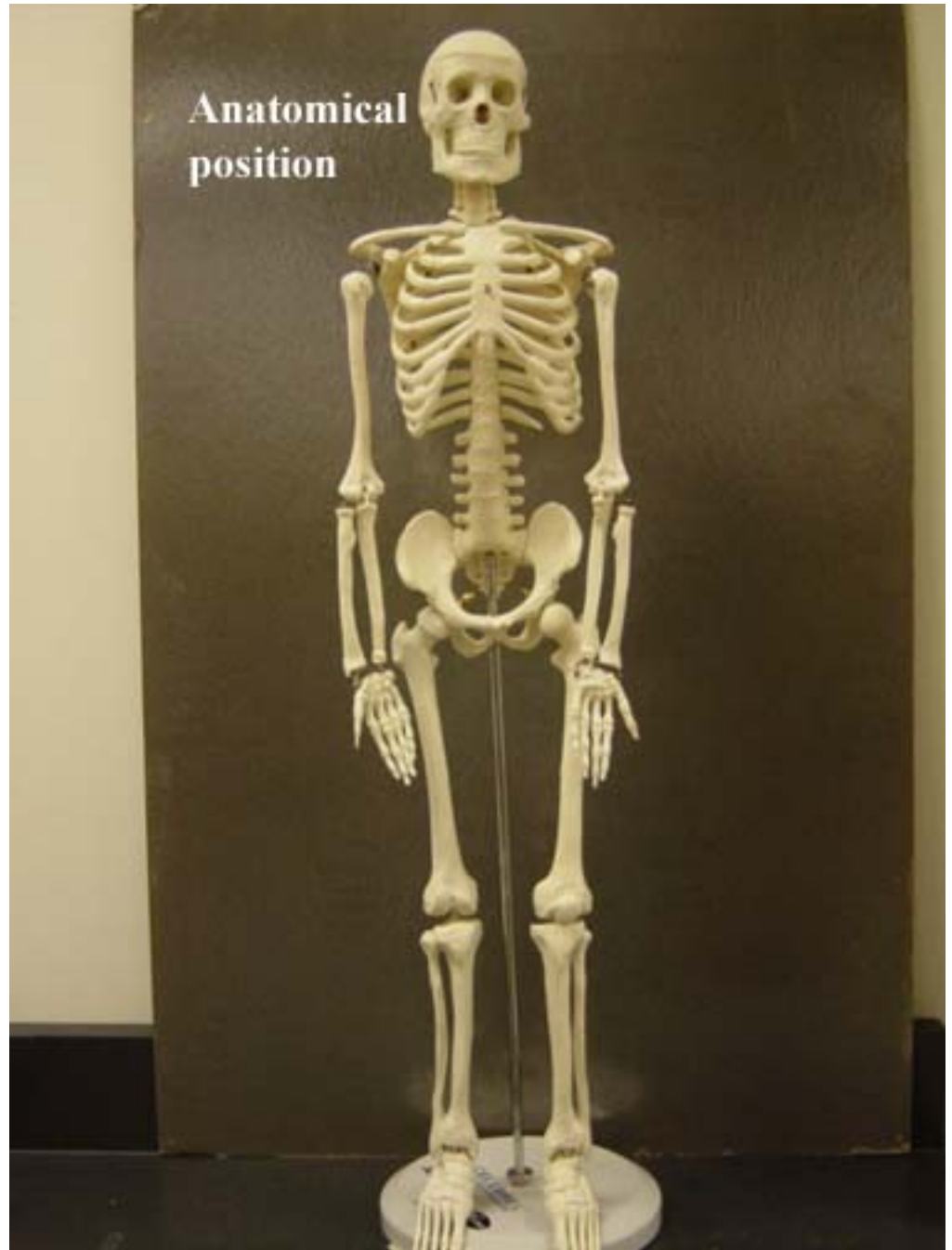
- **Standing erect**
- **Head, eyes, and toes directed forward**
- **Heels & toes together**
- **Upper limbs hanging by the sides with the palms facing anteriorly.**

*\* Note that all structures are described presuming the body in anatomical position, although the body may be placed in any position.*

# Anatomical position



**The bones of the  
body in  
anatomical  
position.**



**The various parts of the body are then described in relation to certain imaginary planes:**

**i - Sagittal Plane;**

**a) Median Plane / Midsagittal Plane**

**b) Paramedian / Parasagittal Plane**

**ii - Coronal / Frontal Planes**

**iii – Horizontal / Transverse Planes**

# ***ANATOMICAL PLANES:***

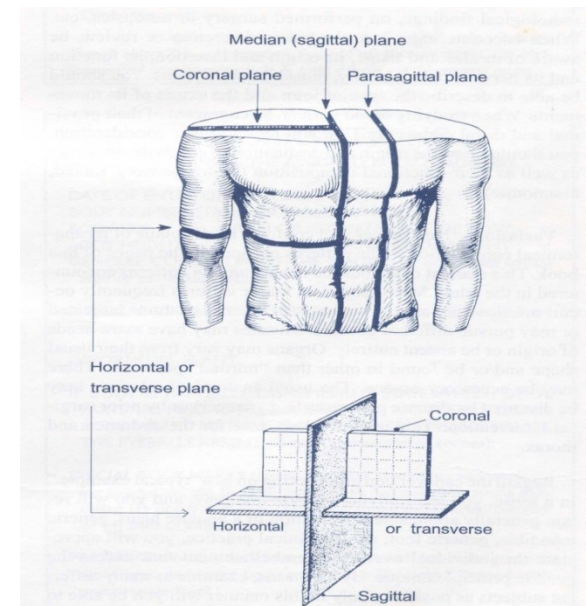
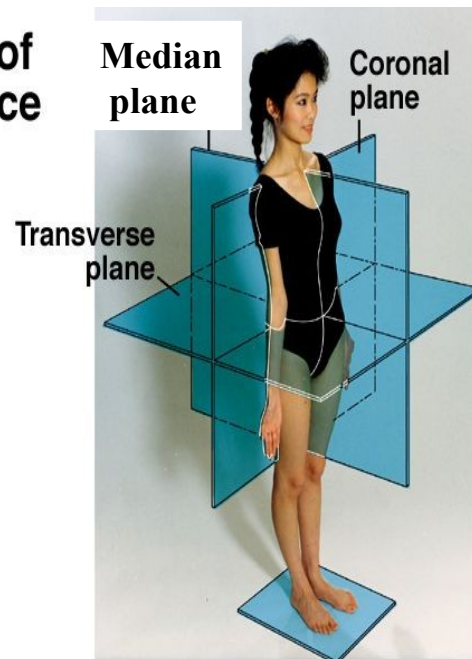
## ***i – Sagittal plane***

### ***a) MEDIAN PLANE***

***- or Median sagittal plane / midsagittal plane:***

***- vertical plane passing lengthwise through the midline of the body from front to back, dividing it equally into right & left halves.***

#### **Planes of Reference**



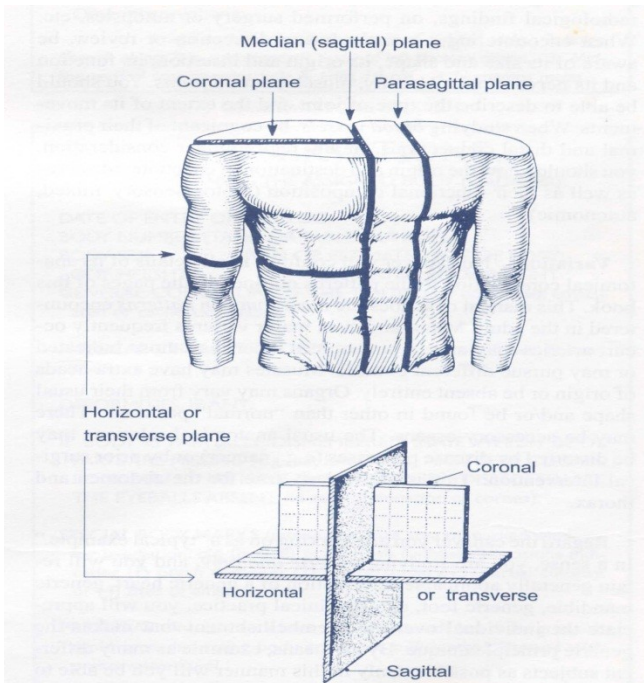
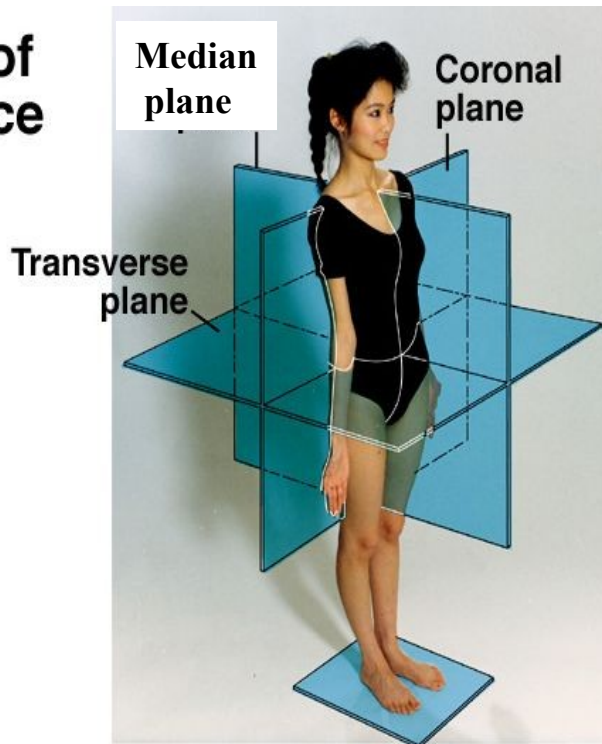
# ***ANATOMICAL PLANES:***

***i – Sagittal plane***

***b) PARASAGITTAL PLANE / PARAMEDIAN PLANE***

- Any plane parallel to the median plane.

## **Planes of Reference**



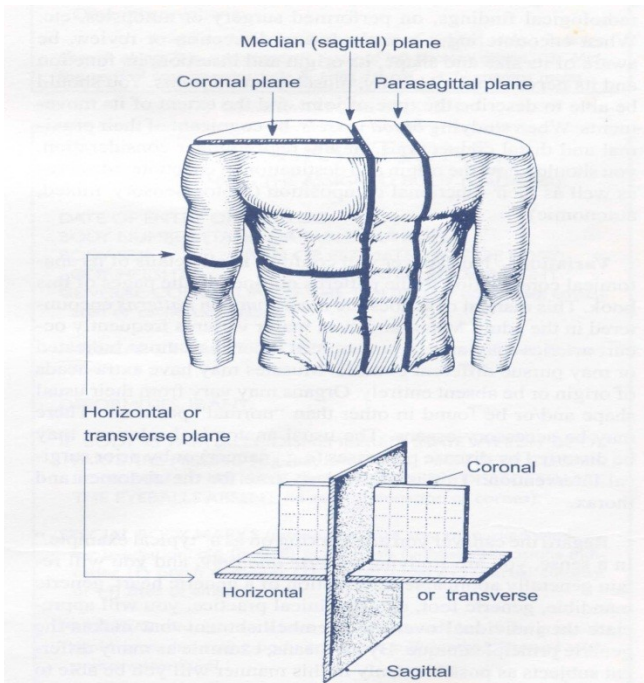
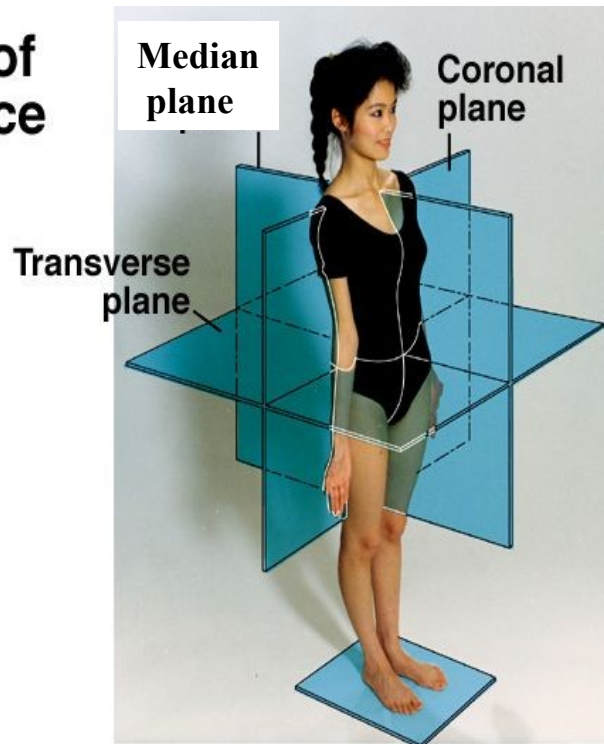


# ANATOMICAL PLANES:

## ii - CORONAL PLANE (Also known as FRONTAL PLANE):

- A vertical plane at right angles to the median plane.

### Planes of Reference





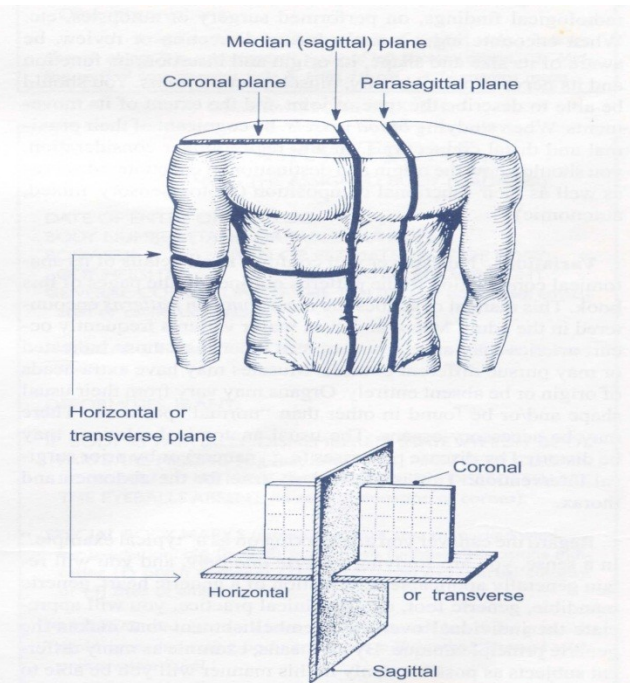
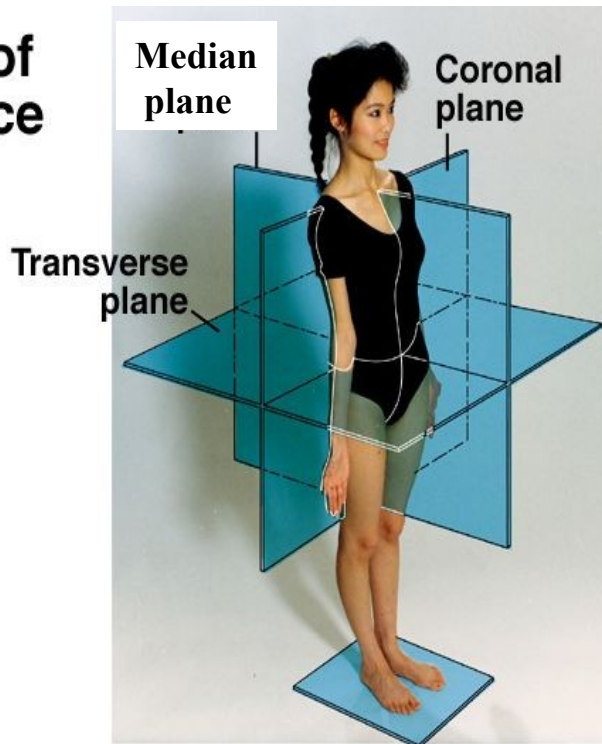
# ***ANATOMICAL PLANES:***

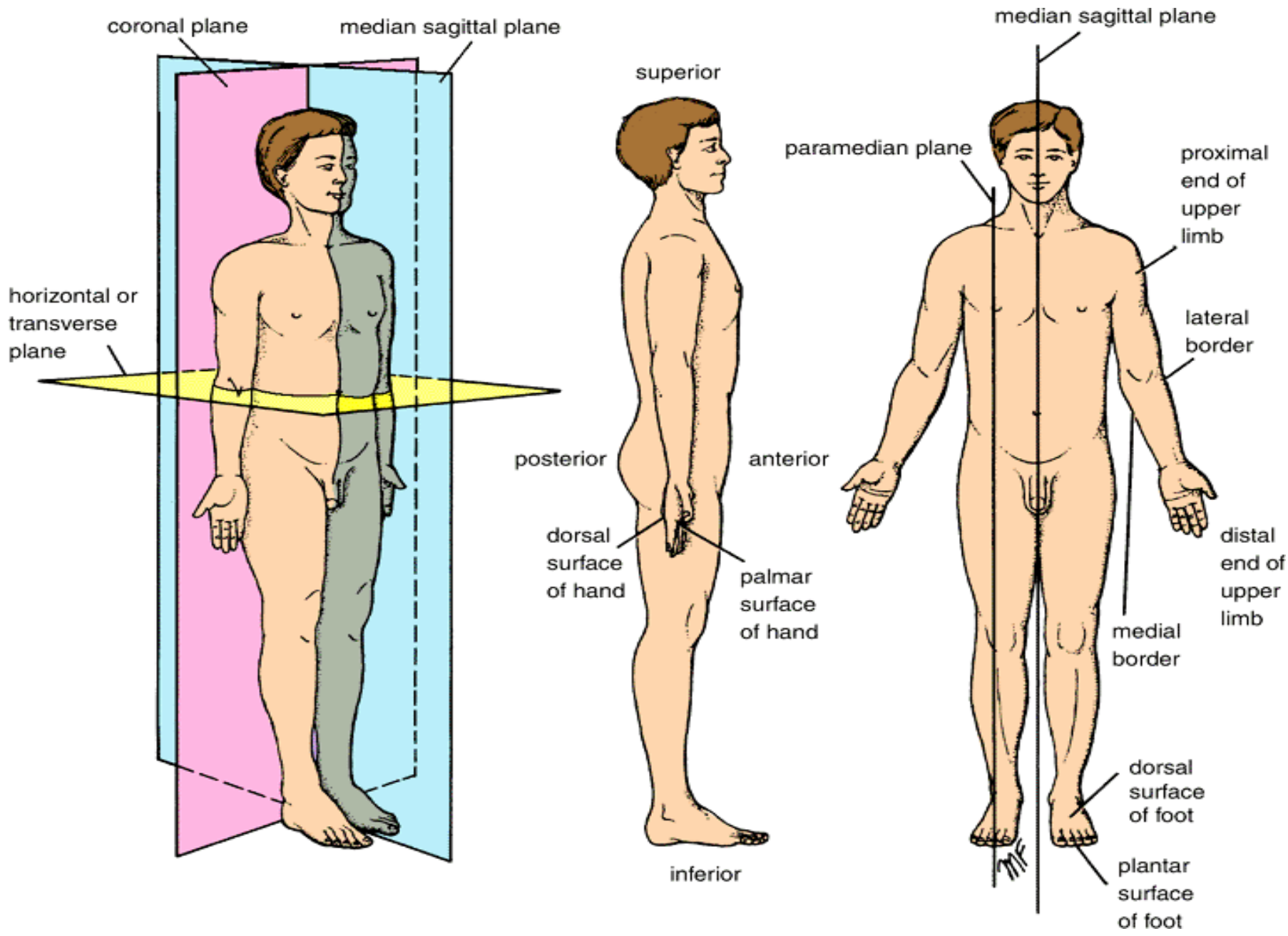
## ***iii - TRANSVERSE PLANE***

***( Also known as HORIZONTAL PLANE)***

- A plane at right angles to a vertical plane divide the body into superior & inferior parts.

### **Planes of Reference**





# **SECTIONS OF THE BODY**

## **i - Longitudinal sections / Vertical sections**

**- run lengthwise in the direction of the long axis of the body or any of its parts and they are applicable regardless of the position of the body. May be cut in the median, sagittal or coronal planes.**

# **SECTIONS OF THE BODY**

## **ii - Transverse sections**

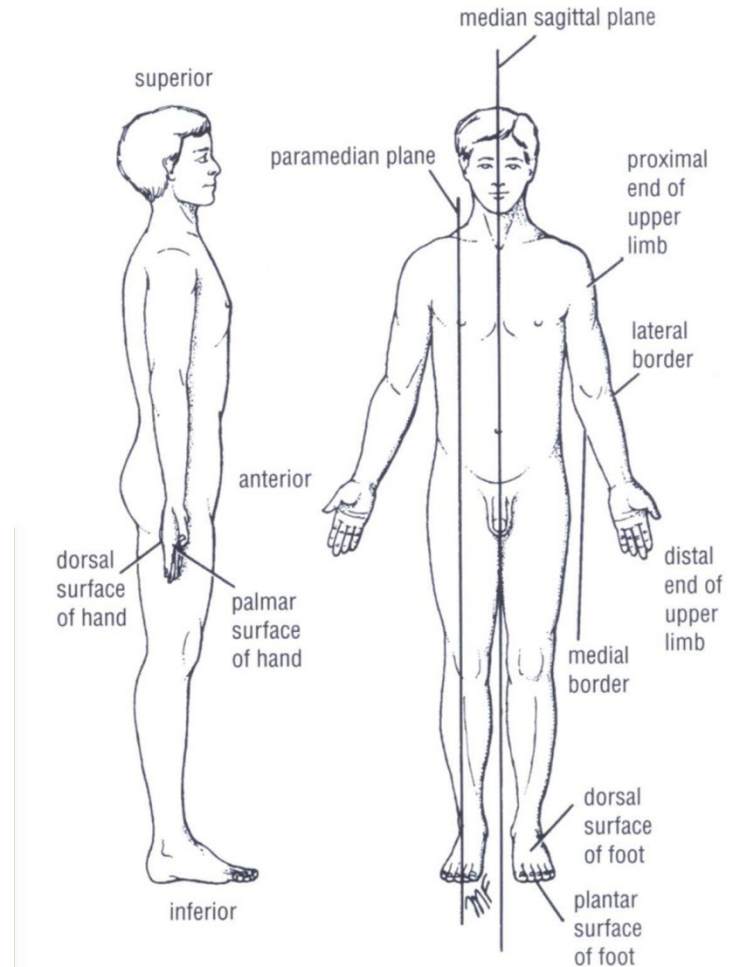
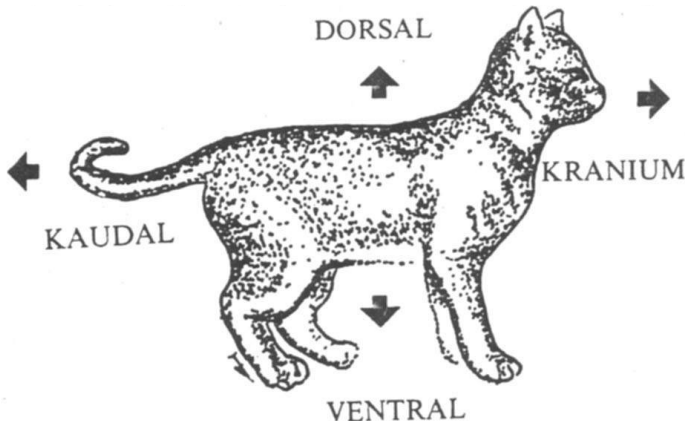
**- cut at right angles to the longitudinal axis of the body or its parts.**

## **iii- Oblique sections**

**- sections not cut in one of the main planes of the body.**

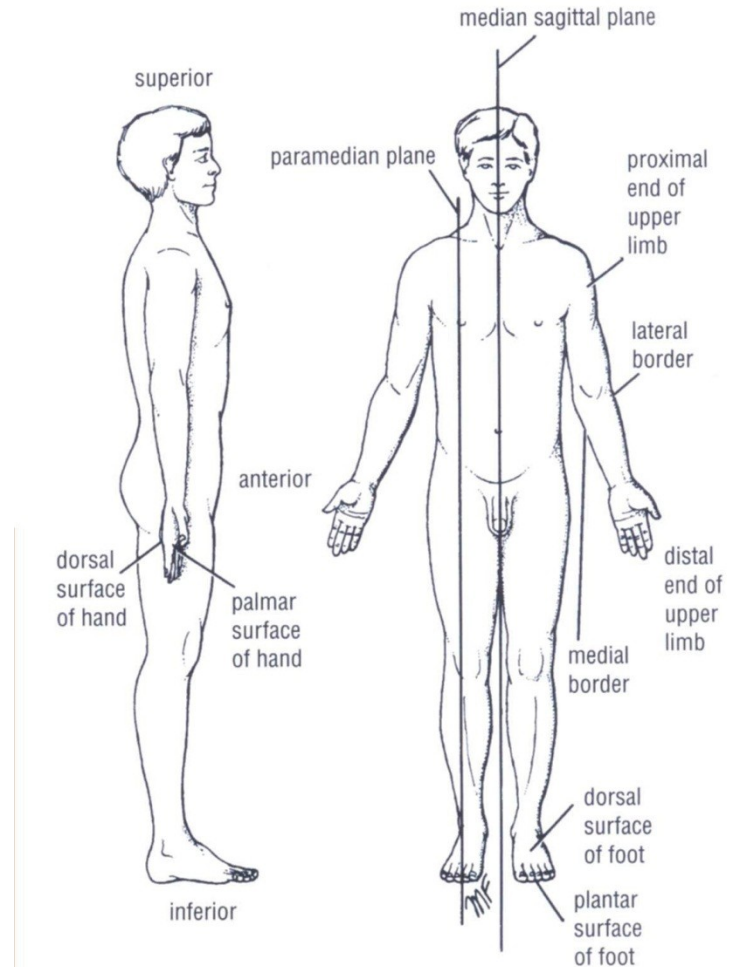
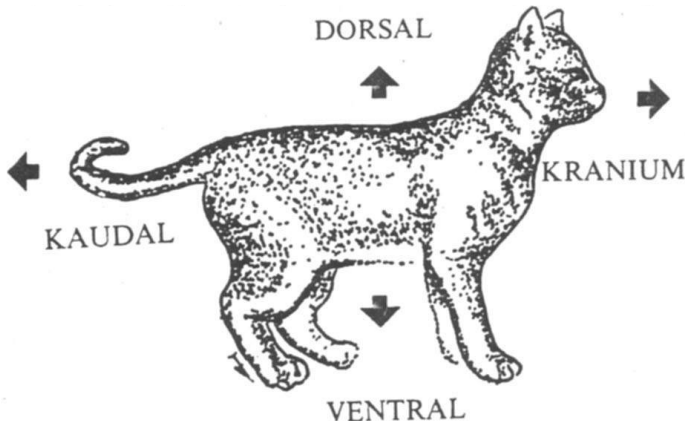
# *Terms of relation used in Gross Anatomy:*

- **Anterior**
  - ventral, front
  - = nearer to the front of the body
- **Posterior**
  - dorsal, behind
  - = nearer to the back of the body



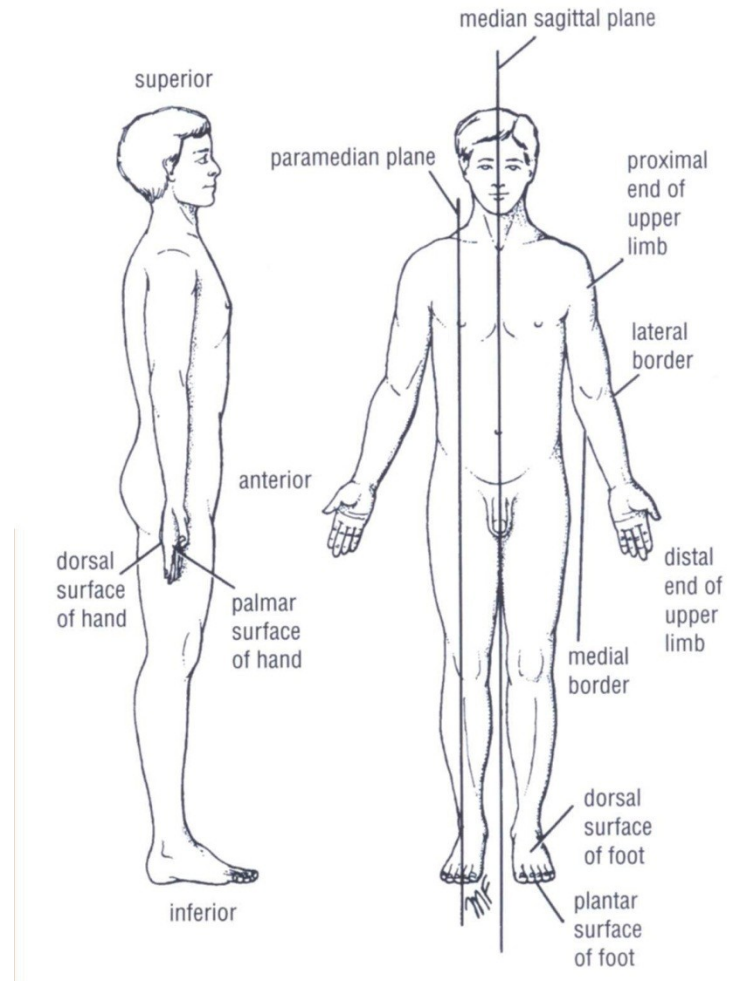
## *Terms of relation used in Gross Anatomy:*

- **Superior, cranial, cephalic, above**  
= toward the head or upper part of the body
- **Inferior, caudal, below**  
= toward the feet or lower part of the body



# *Terms of relation used in Gross Anatomy:*

- **Medial**  
= toward the median plane of the body
- **Lateral**  
= farther away from the median plane

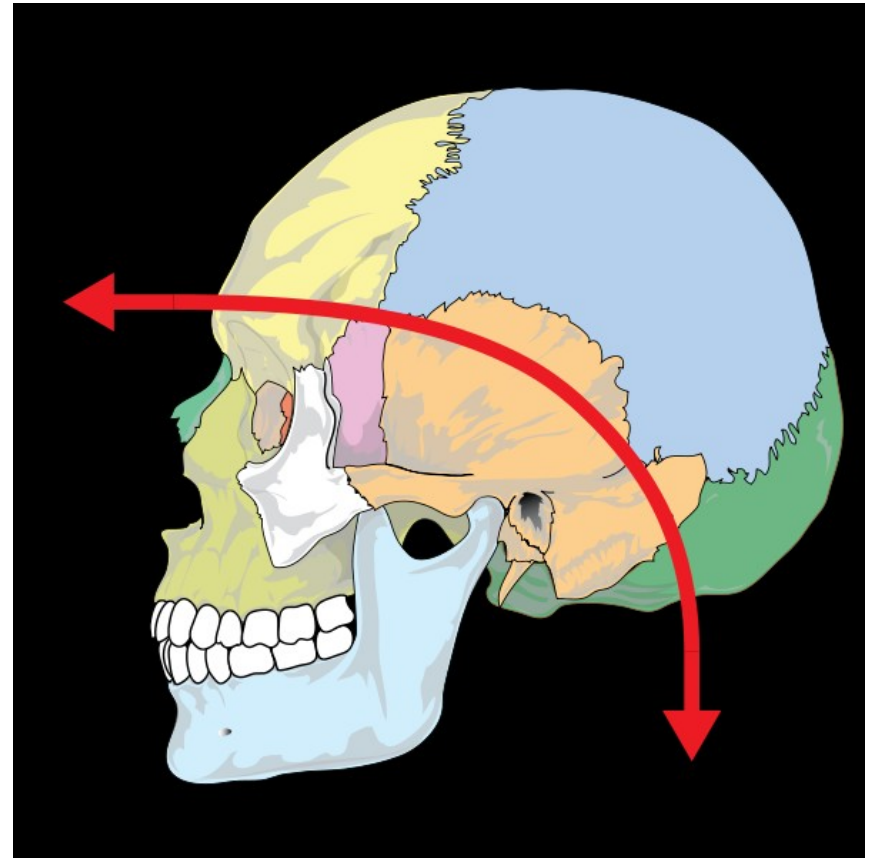




## *Terms of relation used in Gross Anatomy:*

- **Rostral (rostrum = beak)**  
**- anterior**

**Rostral**



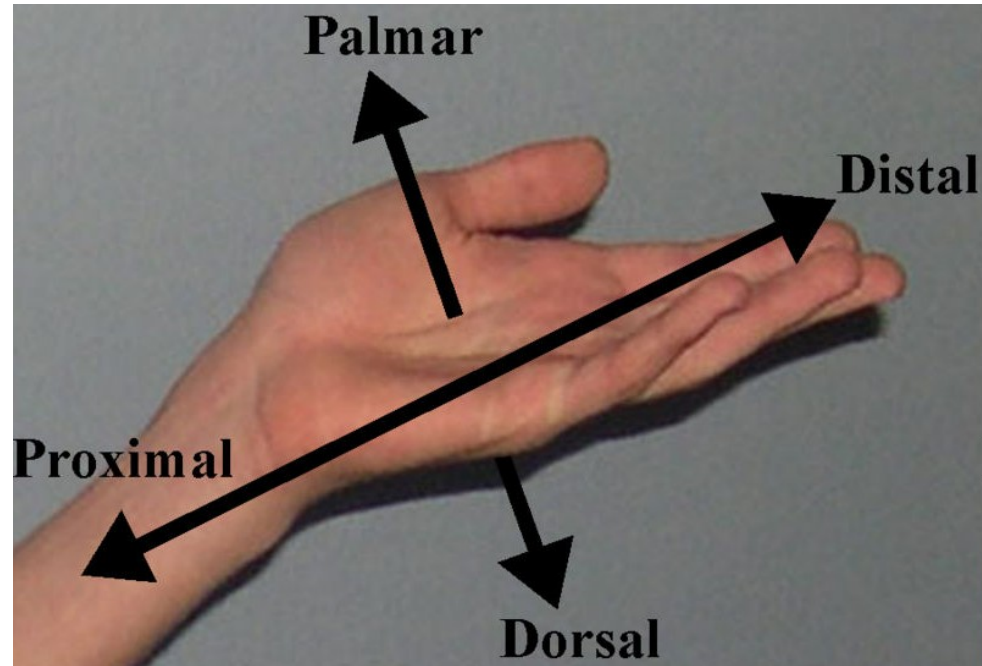
**Caudal**

**Rostral and Caudal shown on a human skull**



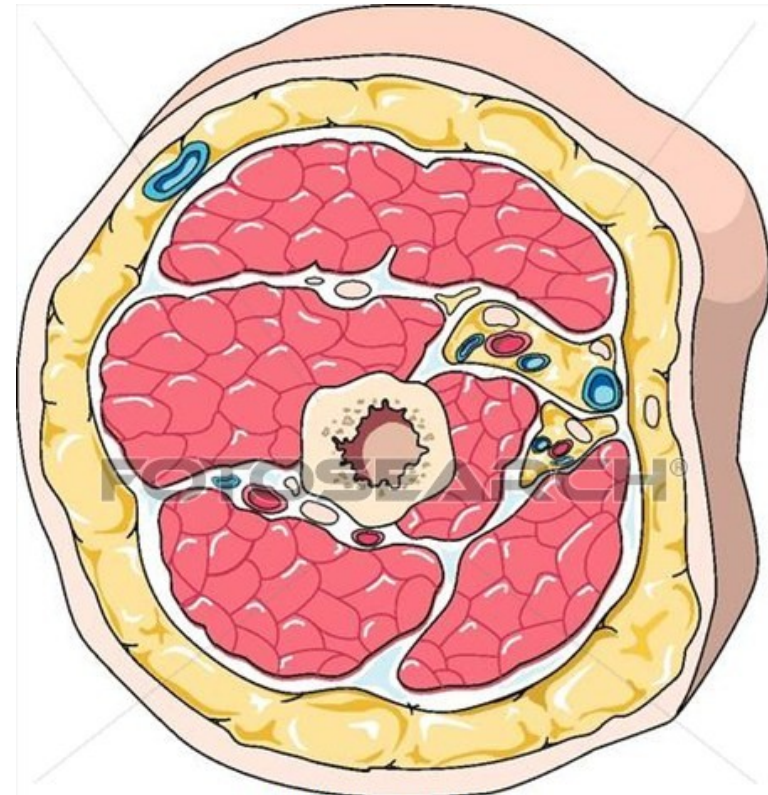
# Terms of comparison

- **Proximal**  
- nearest the trunk or point of origin
- **Distal**



# Terms of comparison

- **Superficial**  
- nearer to the surface
- **Profundus/deep**

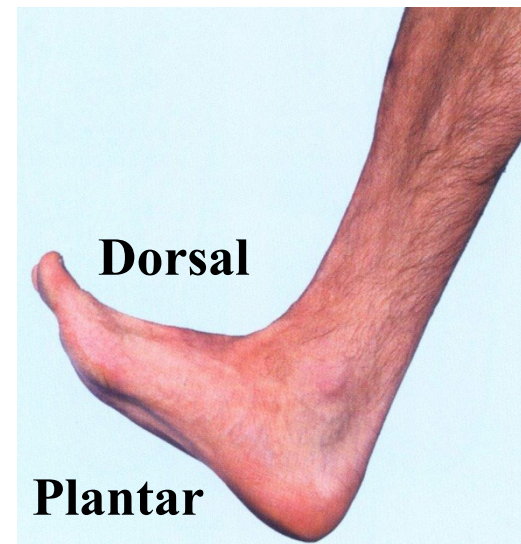
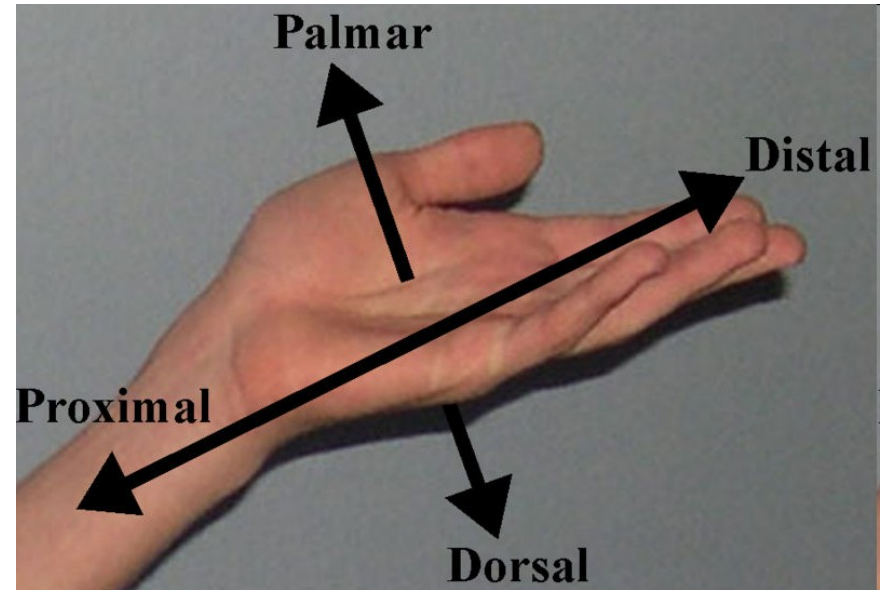


# Terms of comparison

- **Interior**
  - inside, inner, internal
  - nearer to the center of organ or cavity
- **Exterior**
  - outside, outer, external
- **Ipsilateral**
  - on the same side
- **Contralateral**

# Terms:

- in describing the hand:
  - palmar & dorsal surfaces
- in describing the foot:
  - plantar & dorsal surfaces

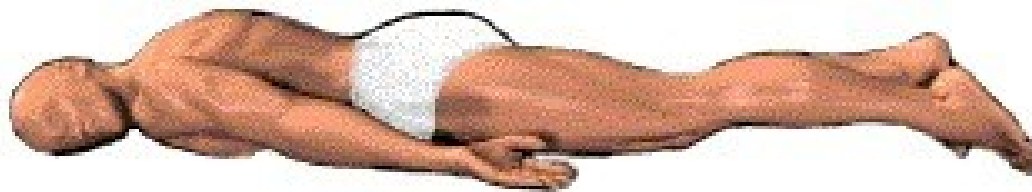


**The supine position of the body is lying on the back.**

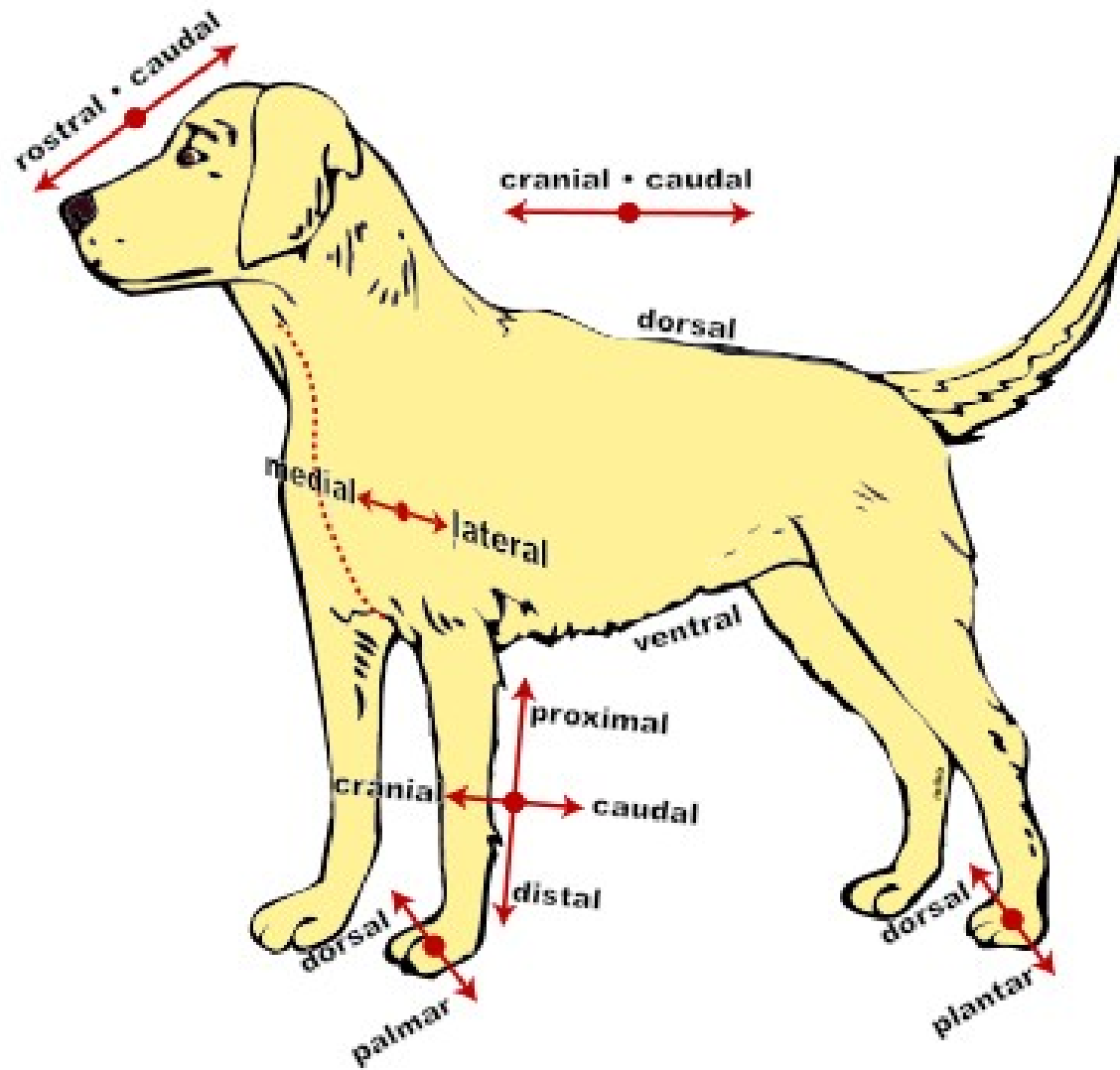
**The prone position is lying face downward.**



**Supine**



**Prone**



# Combined terms

**Eg:**

- **Inferolateral**
- **Anteroinferior**
- **Anterosuperior**
- **Posteroinferior**



# **Terms Related to Movement:**

**A site where two or more bones come together is known as a joint.**

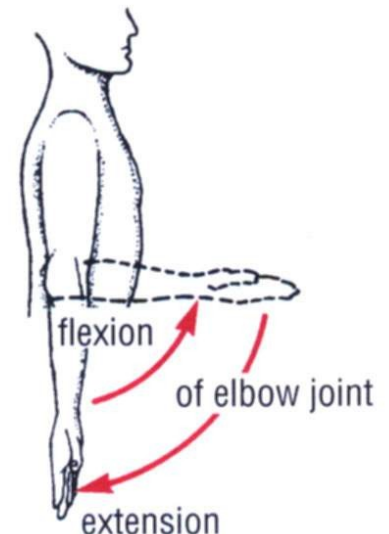
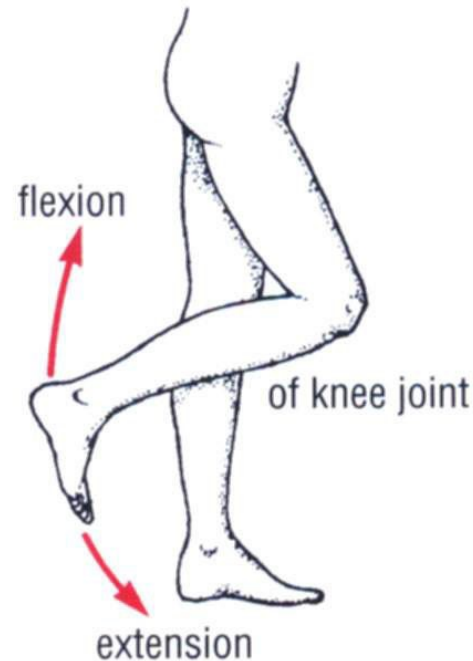
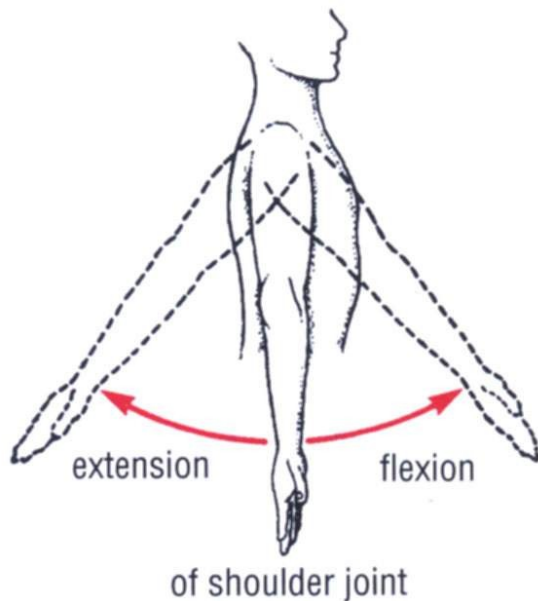
**Some joints have:**

- no movement (eg: sutures of the skull)**
- some have only slight movement (eg: superior tibiofibular joint)**
- some are freely movable (eg: shoulder joint).**

# Terms of movement

## 1) Flexion

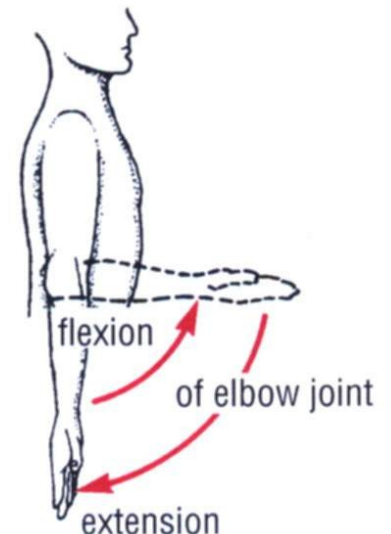
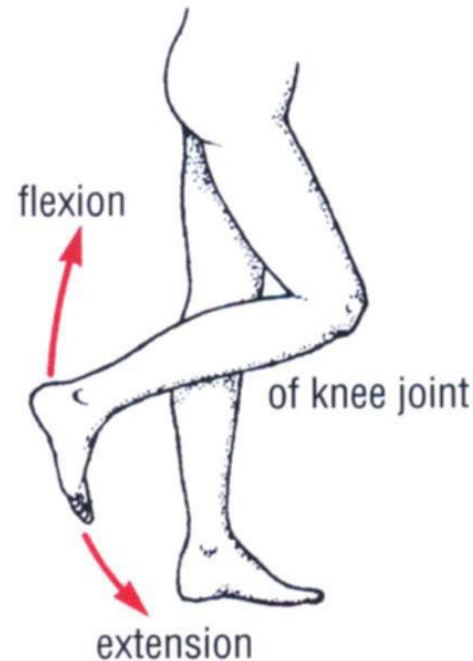
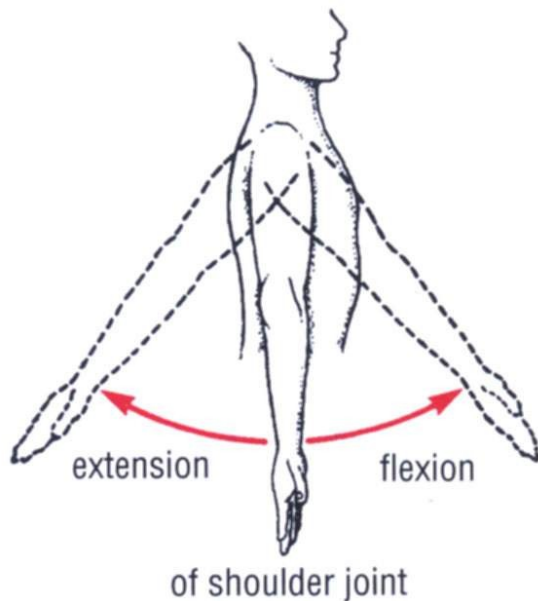
- bending or making a decreasing angle between the bones or parts of the body
- usually anterior bending in a sagittal plane



# Terms of movement

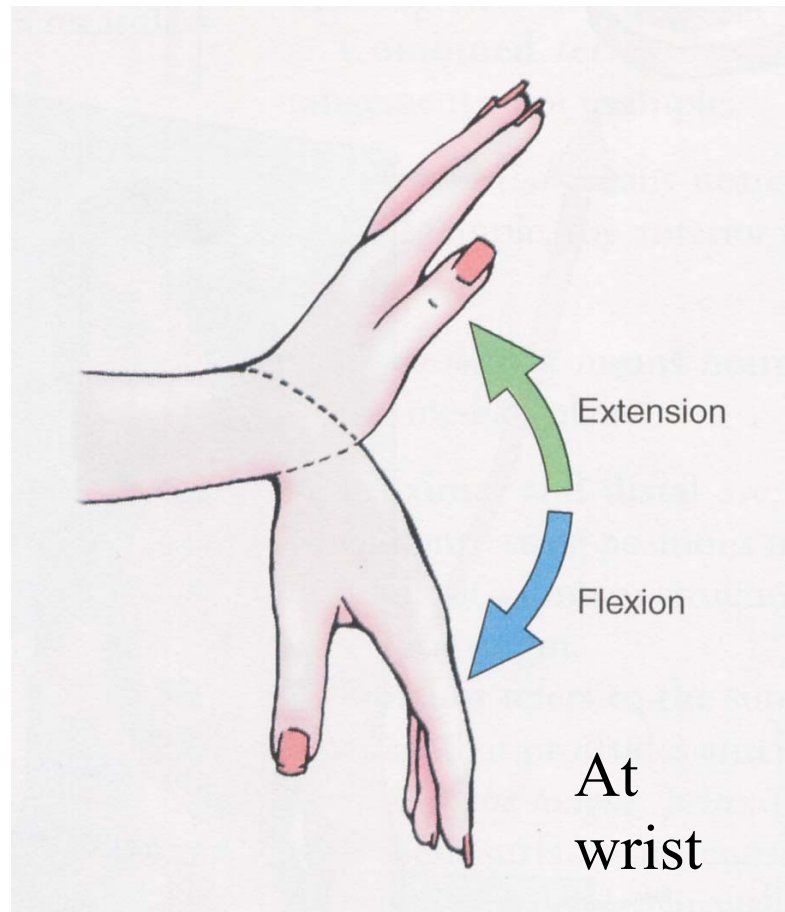
## 2) Extension

- straightening of a bent or making an increasing angle between the bones or parts of the body
- hyperextension



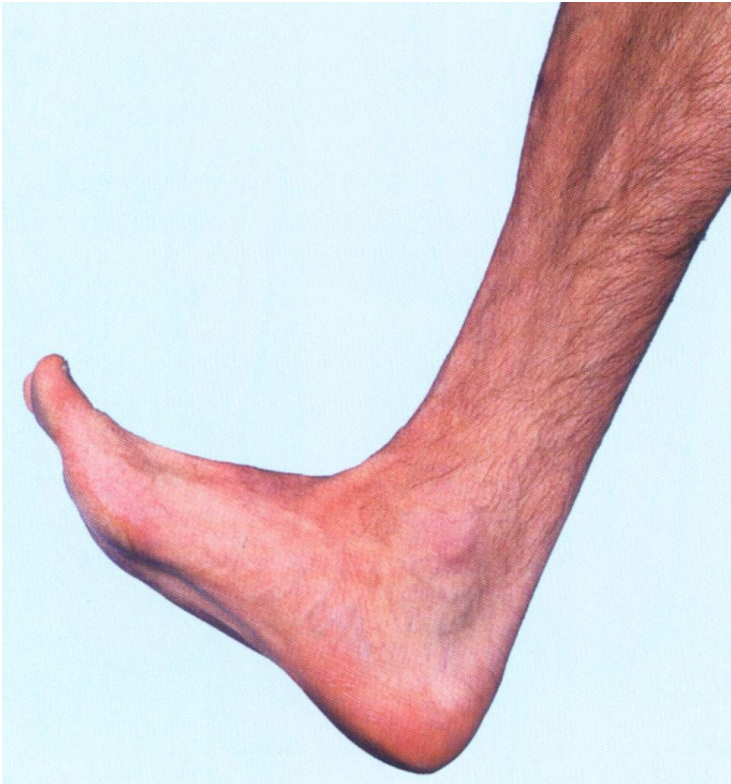
# Terms of movement

Wrist joint: flexion & extension

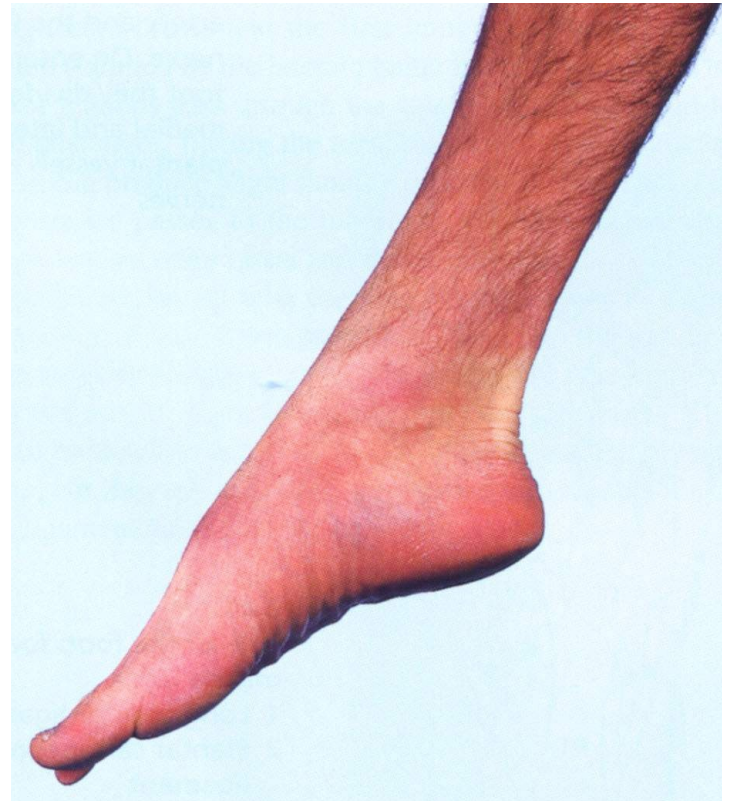


# Terms of movement

**A**



**B**



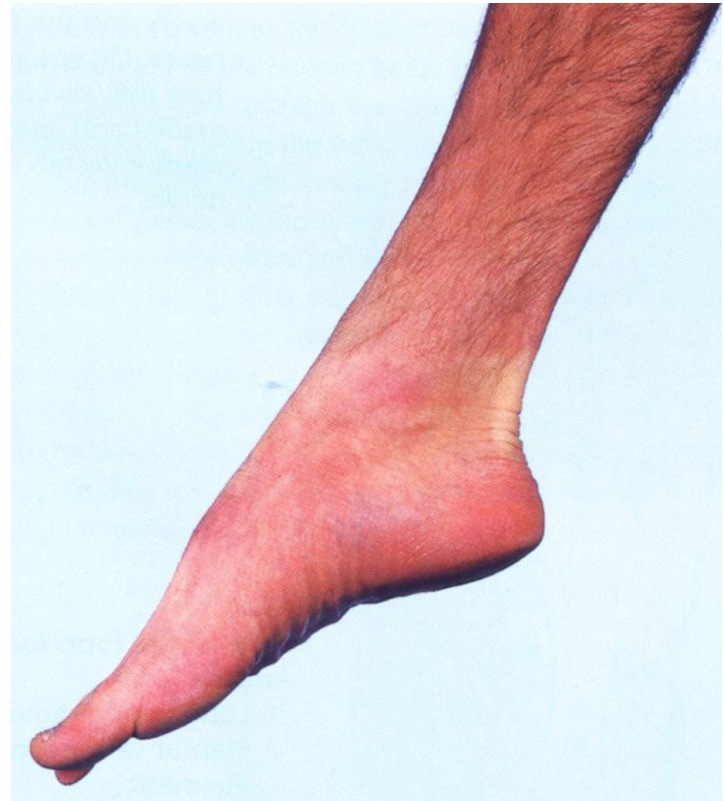


# Terms of movement

**Dorsiflexion of foot**



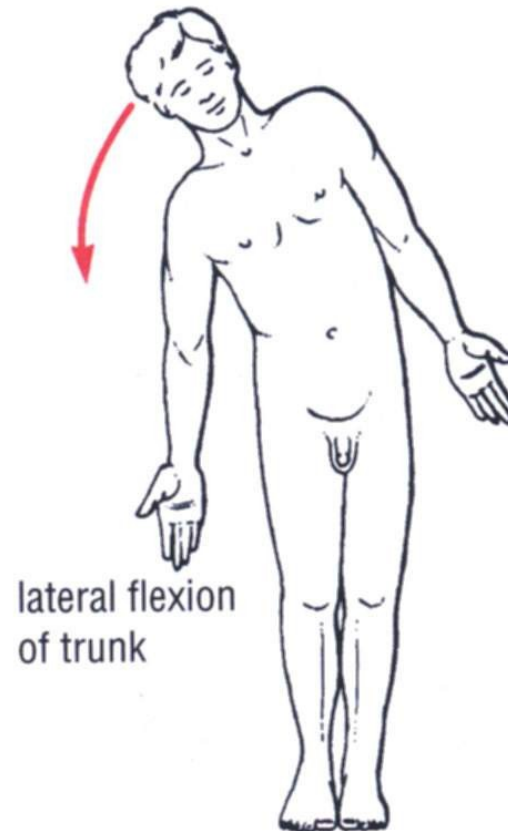
**Plantarflexion of foot**



# Terms of movement

## 3) Lateral bending

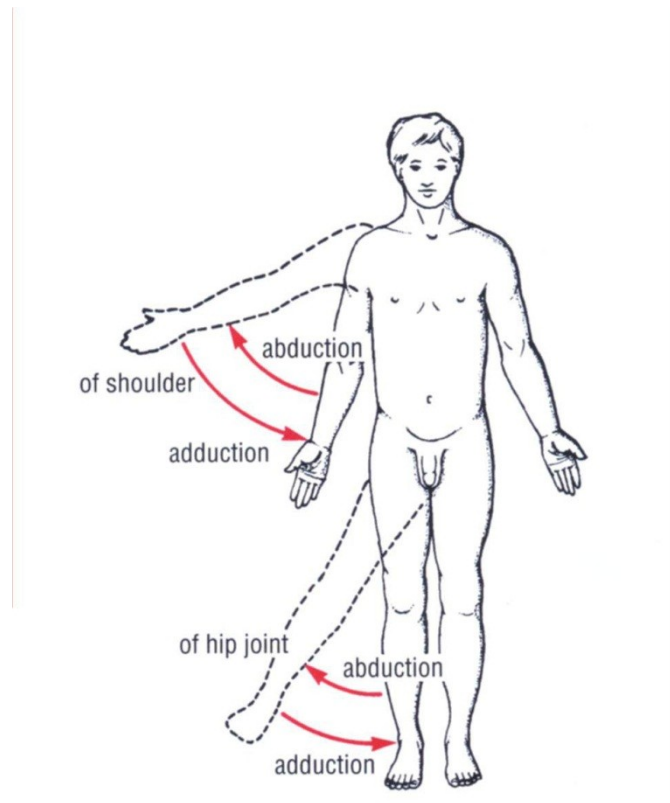
- movement of the trunk in the coronal plane



# Terms of movement

## 4) Abduction

- movement of a limb away from the midline of the body in the coronal plane

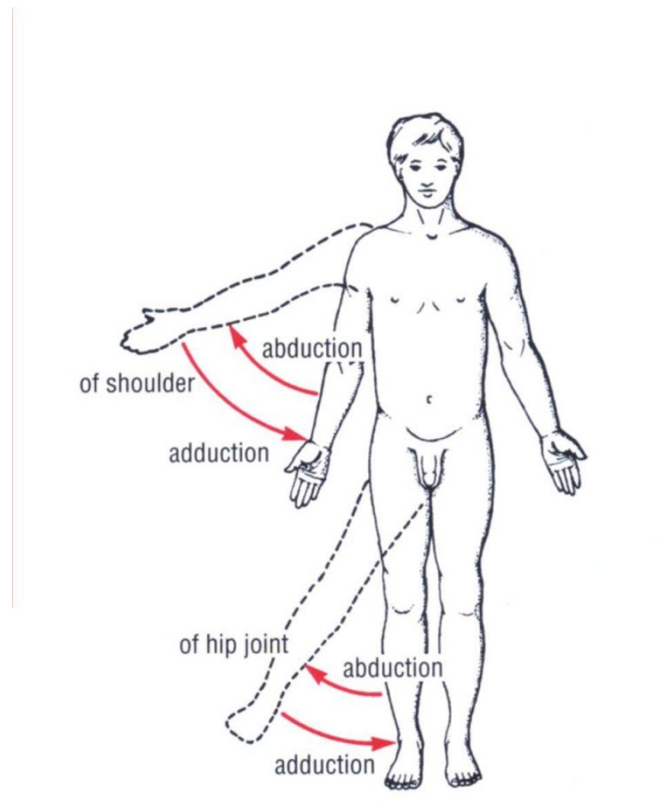




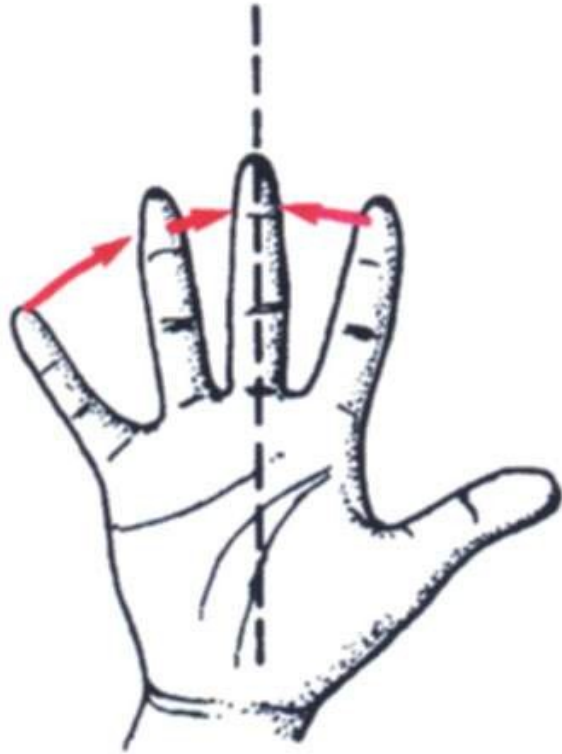
# Terms of movement

## 5) Adduction

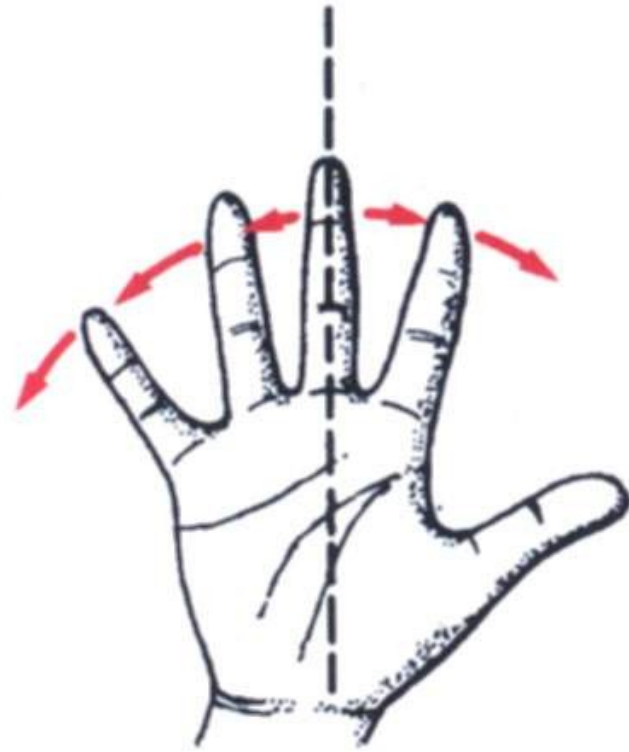
- movement of a limb toward the body in the coronal plane



# Terms of movement

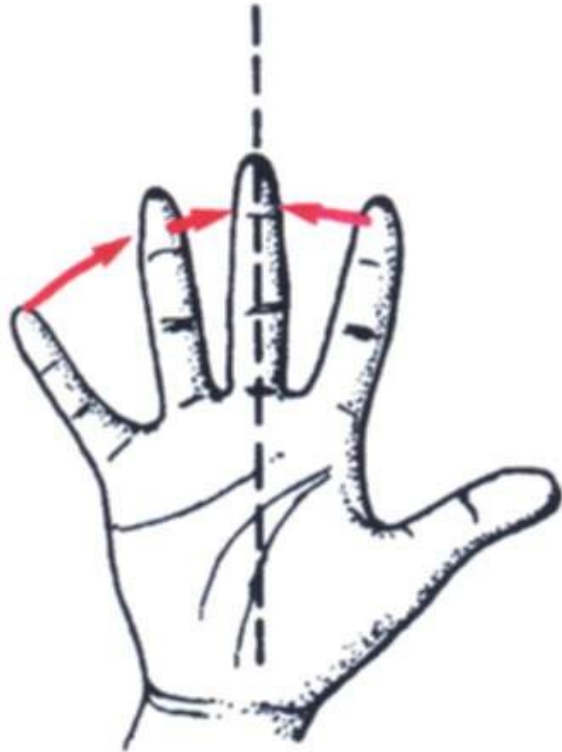


**A**

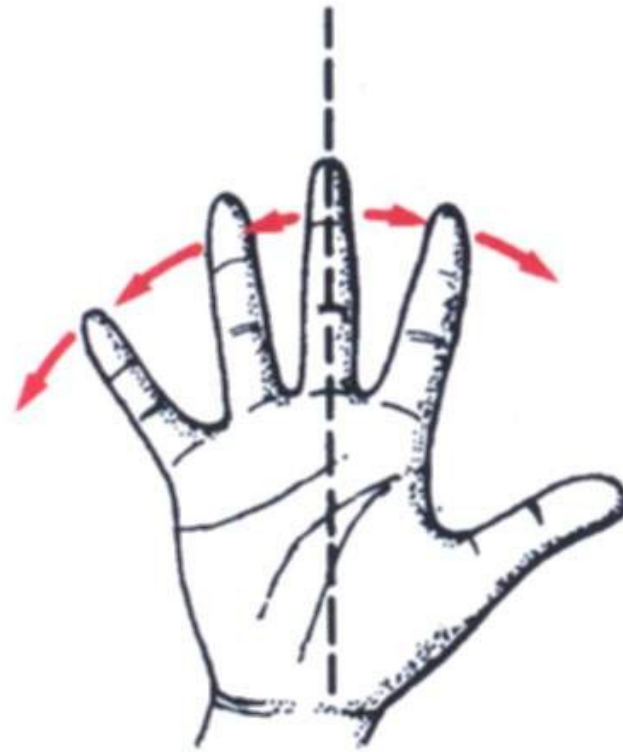


**B**

# Terms of movement



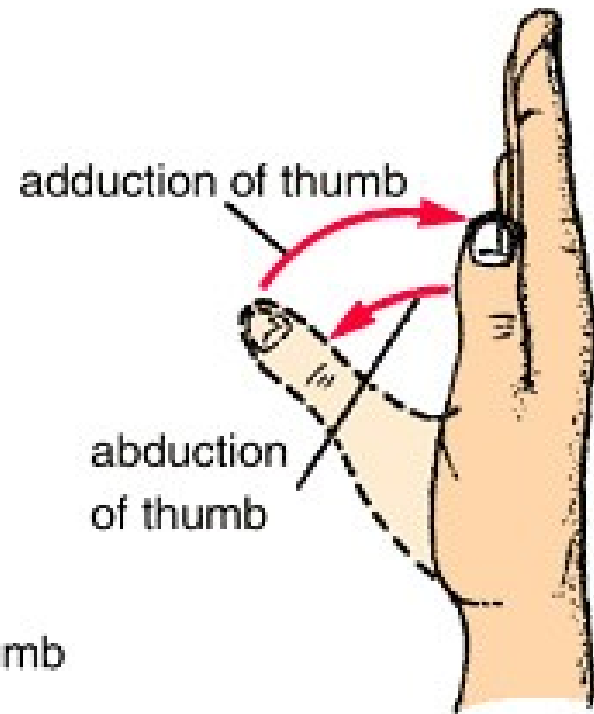
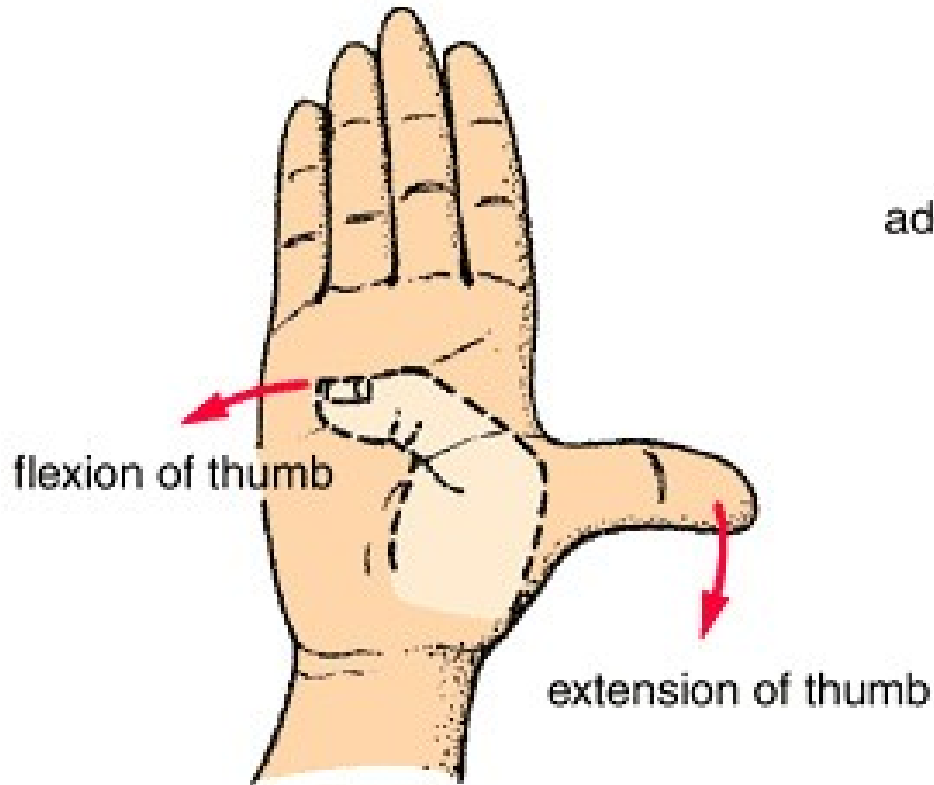
adduction of fingers



abduction of fingers

# Terms of movement

Thumb : adduction & abduction  
: flexion & extension



# Terms of movement

## 6) Opposition

- the thumb pad is brought to a finger pad

opposition of thumb  
and little finger

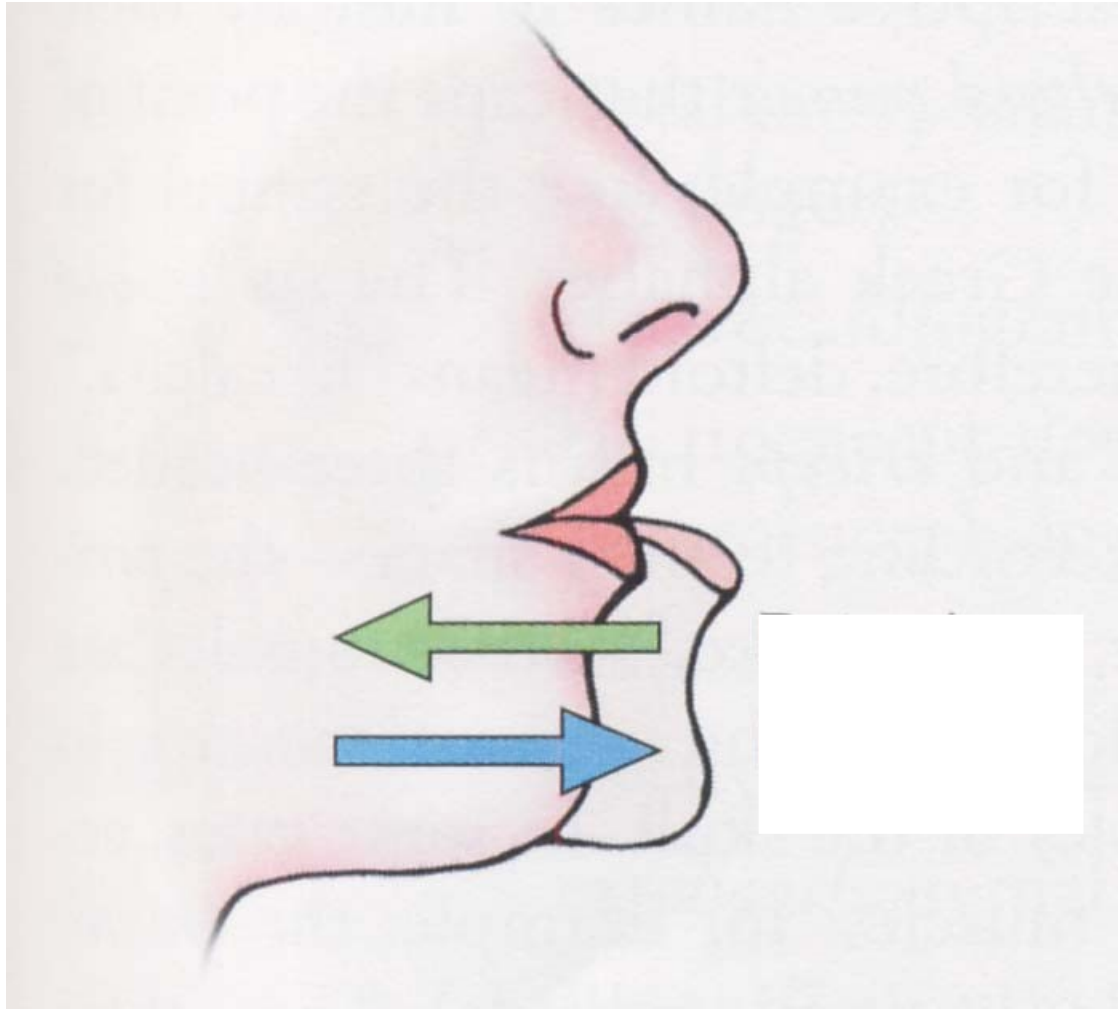


# Terms of movement

- **7) Protraction**  
- a movement anteriorly
- **8) Retraction**  
- a movement posteriorly



## protraction & retraction



# Terms of movement

## 9) Elevation

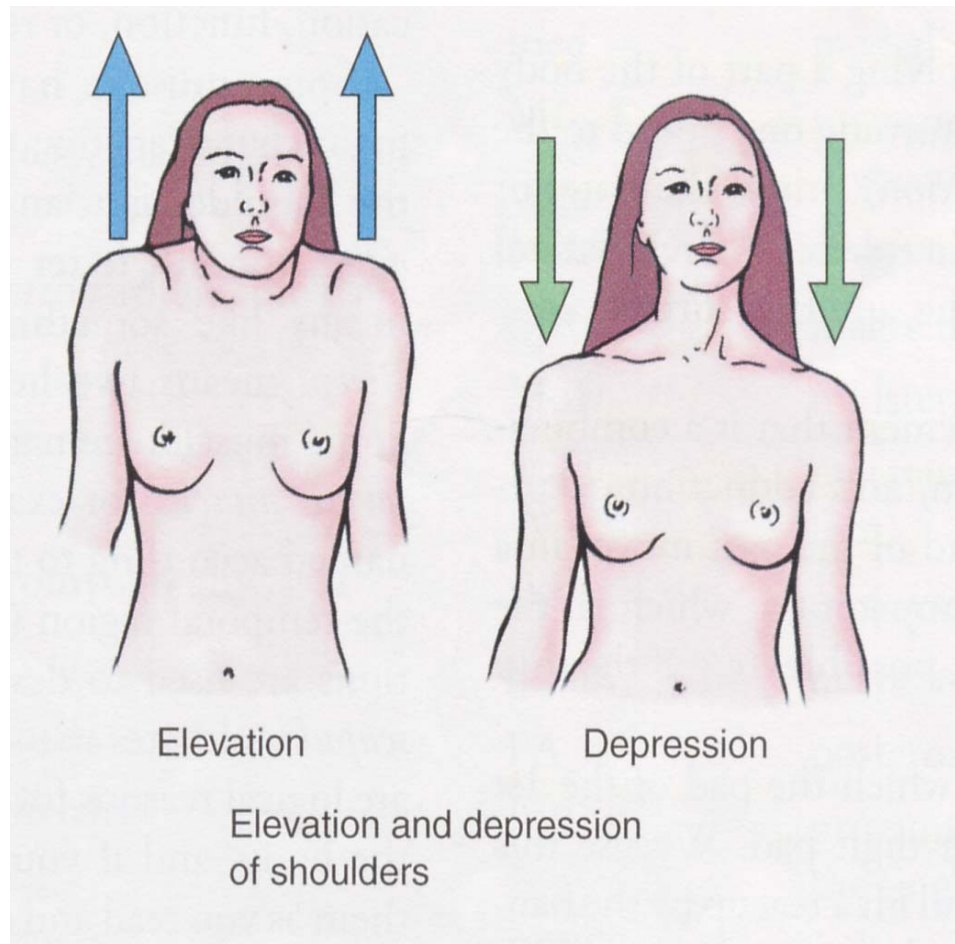
- lifting, raising, or moving a part superiorly

## 10) Depression

- letting down, lowering, or moving a part inferiorly

# Terms of movement

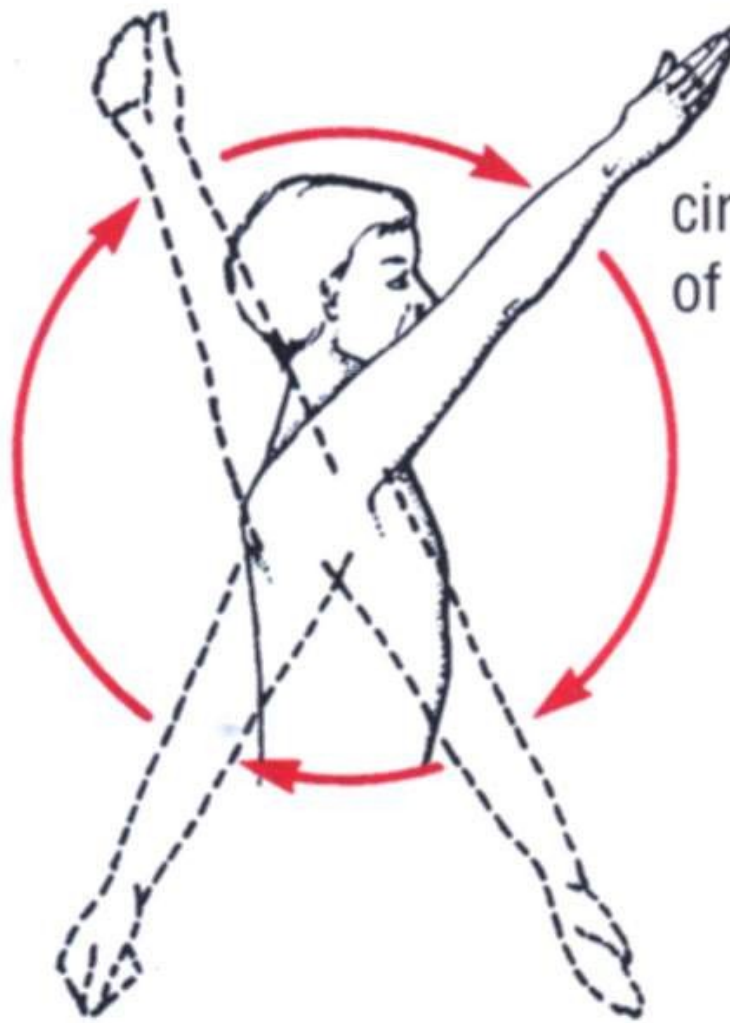
## Elevation & depression of shoulder



# **Terms of movement**

## **11) Circumduction**

- refers to a circular movement**
- to draw around or to form a circle**

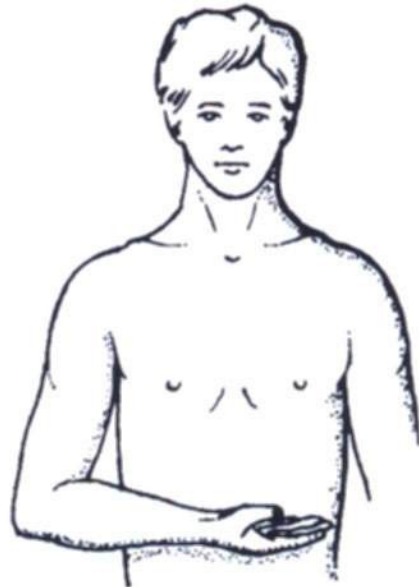


circumduction  
of shoulder joint

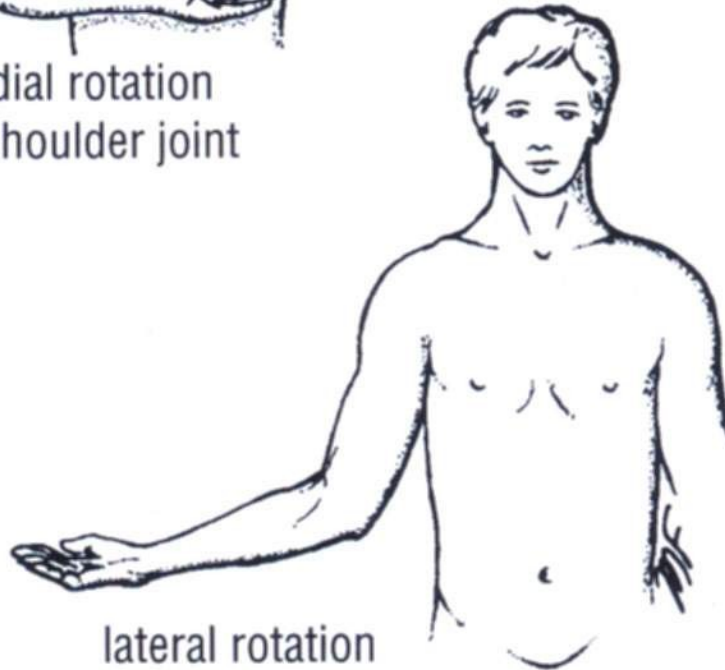
# Terms of movement

## 12) Rotation

- turning or revolving of a part of the body around its long axis



medial rotation  
of shoulder joint



lateral rotation  
of shoulder joint

# Terms of movement

## 13) Inversion of the foot

- inversion is the movement of the foot so that the sole faces in a medial direction

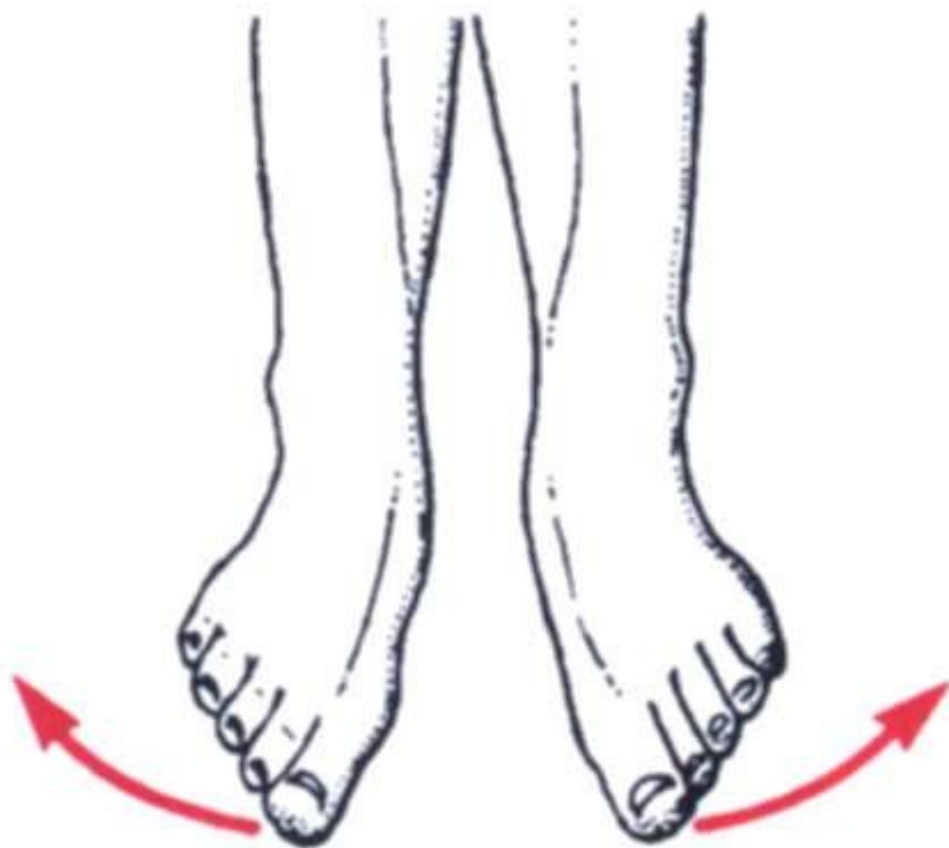
## 14) Eversion of the foot

- Eversion is the opposite movement of the foot so that the sole faces in a lateral direction





inversion of foot



eversion of foot

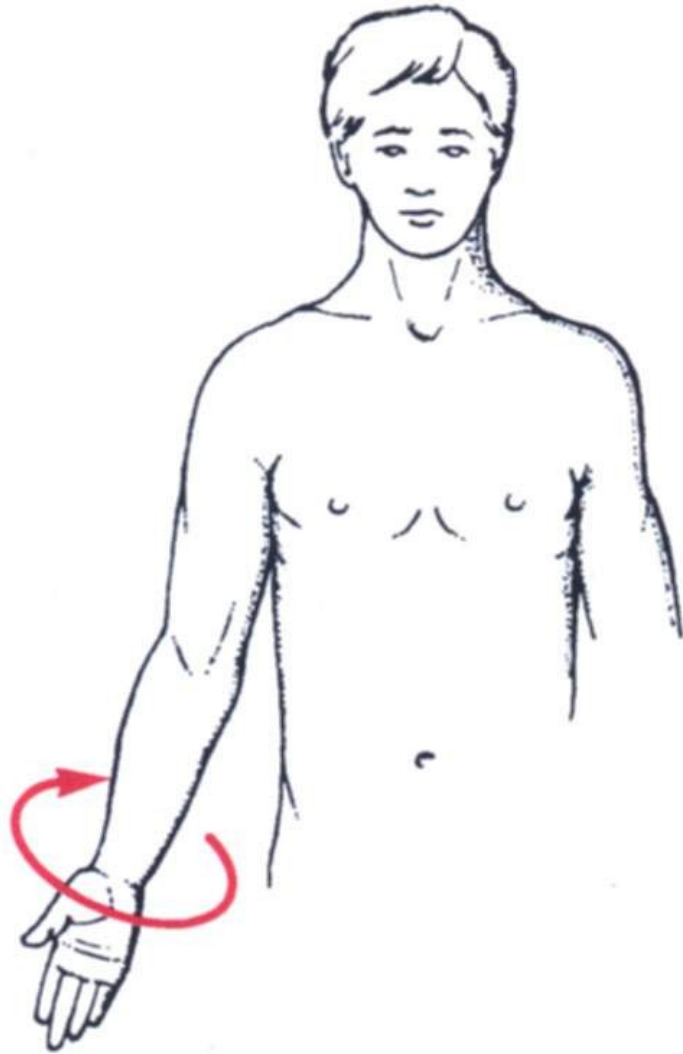
# Terms of movement

## 15) Pronation

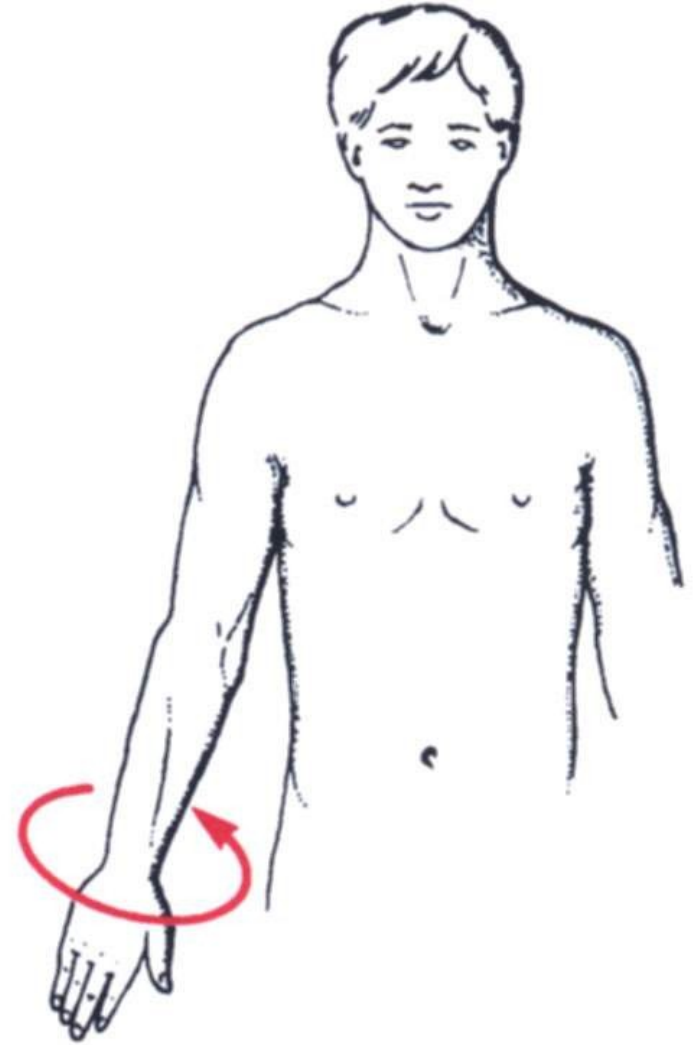
**Pronation of the forearm is a medial rotation of the forearm in such a manner that the palm of the hand faces posteriorly**

## 16) Supination

**the forearm from the pronated position so that the palm of the hand comes to face anteriorly**

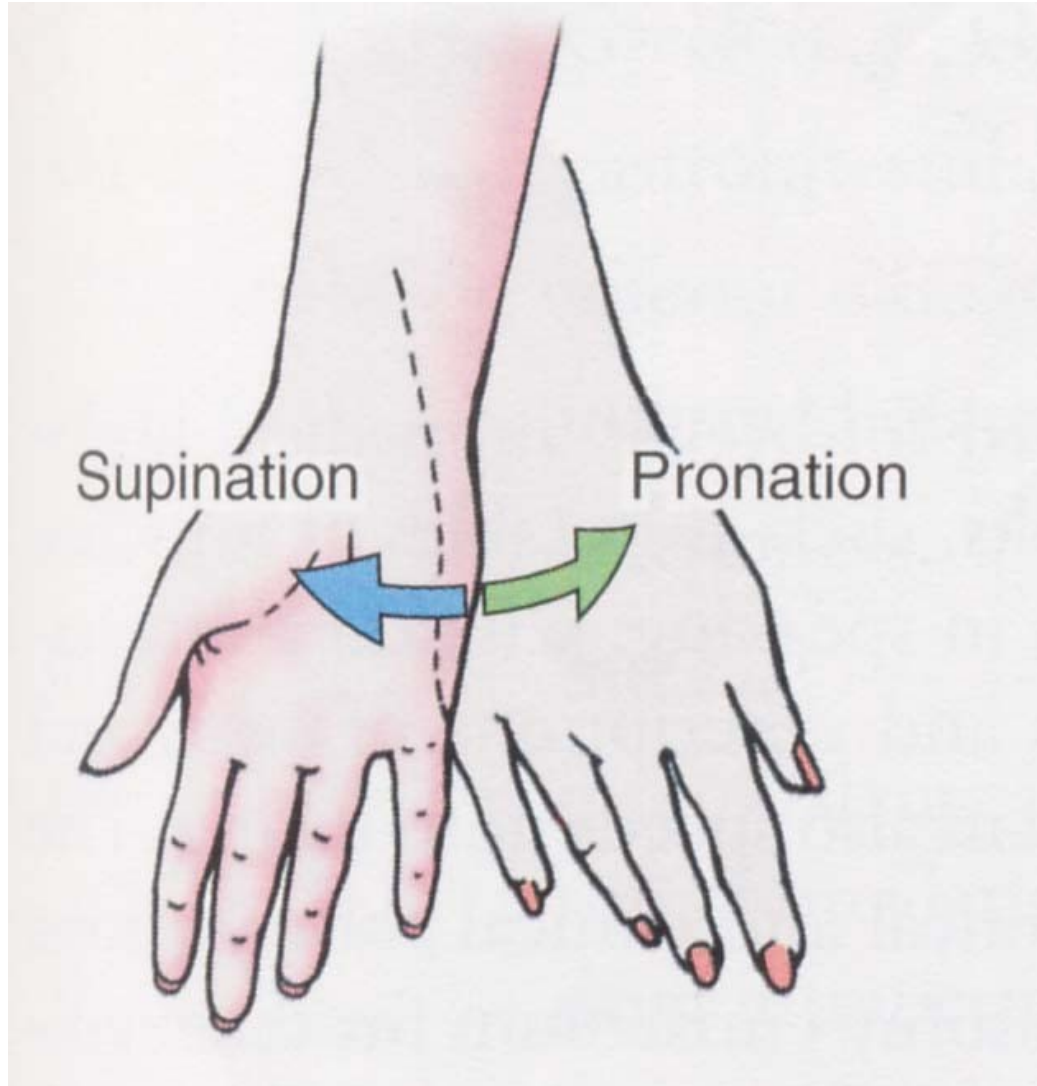


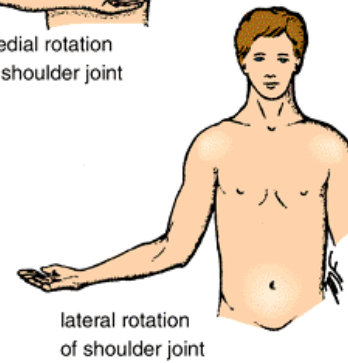
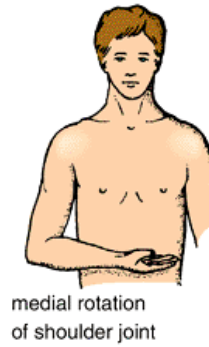
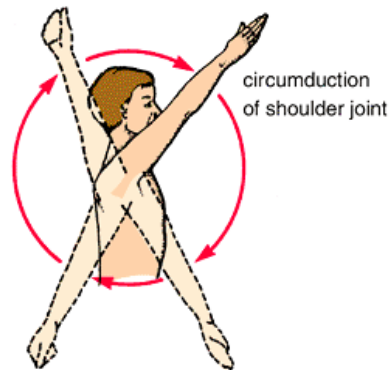
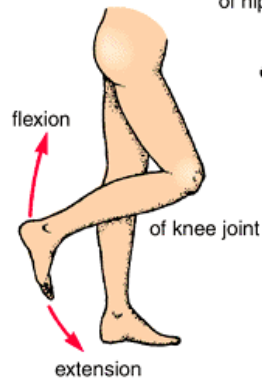
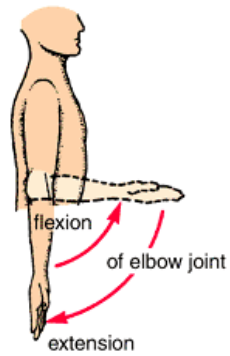
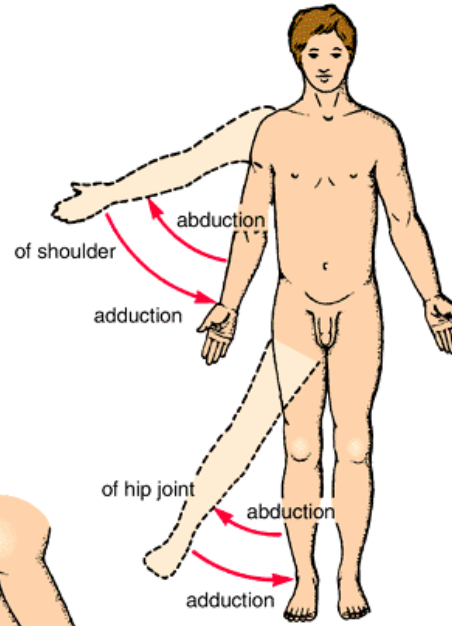
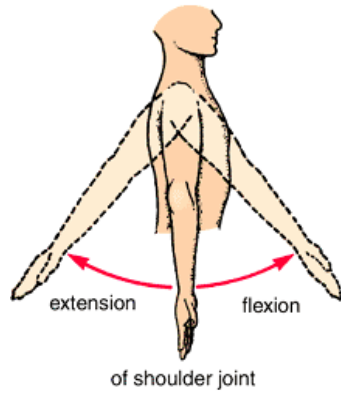
supination of forearm

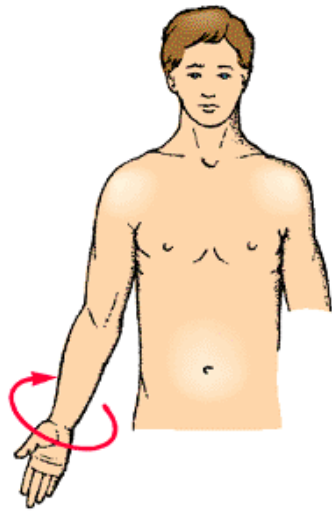


pronation of forearm

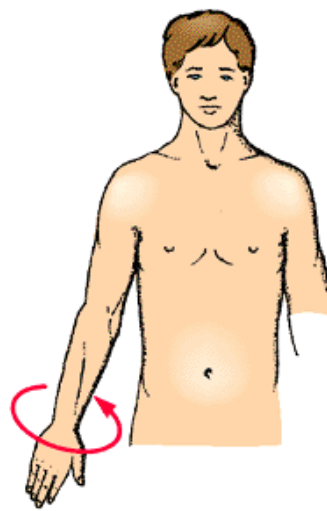
## Pronation, supination



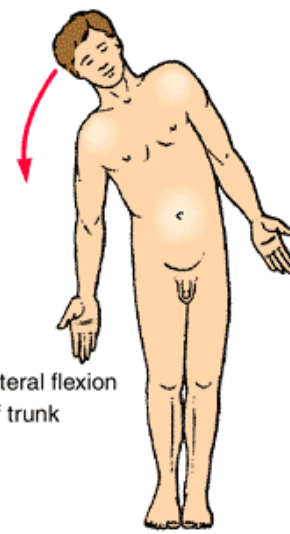




supination of forearm



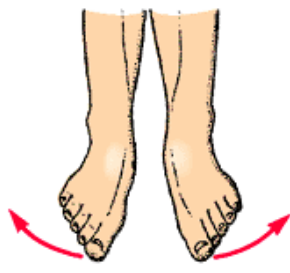
pronation of forearm



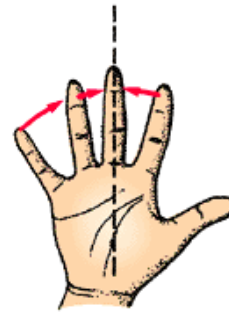
lateral flexion of trunk



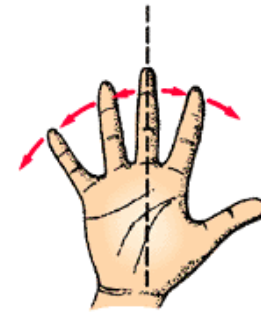
inversion of foot



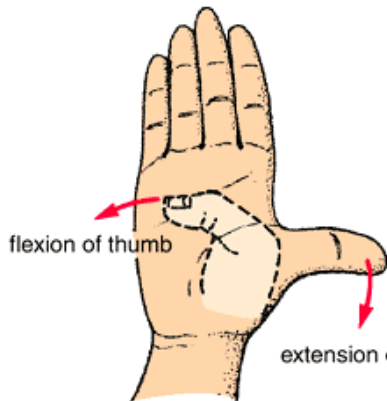
eversion of foot



adduction of fingers

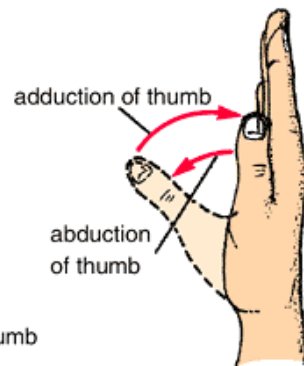


abduction of fingers



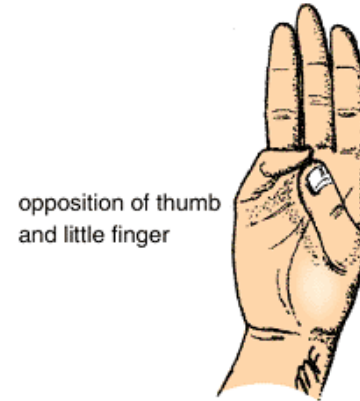
flexion of thumb

extension of thumb



adduction of thumb

abduction of thumb



opposition of thumb and little finger