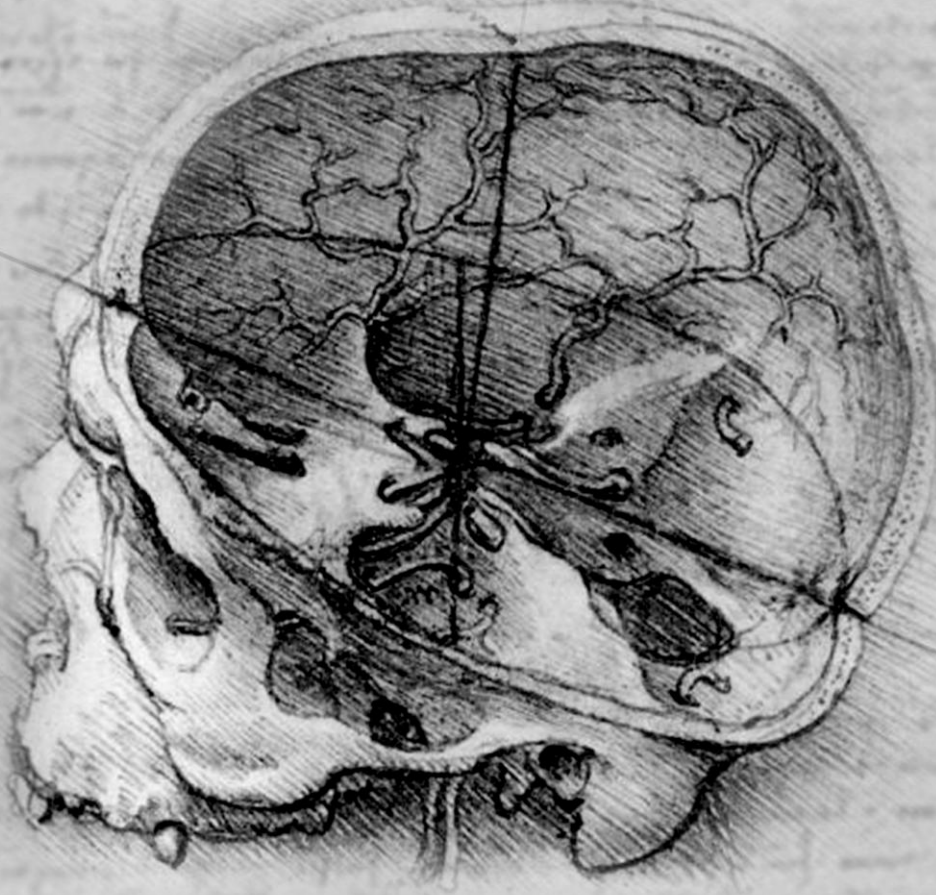


COVER BY MOHAMED F. ABU ALIA

# ANATOMY & EMBRYOLOGY



LECTURE #: 1

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SHEET ☒

DONE BY Shatha Tailakh

SLIDES ☐

# Introduction to anatomy

\* **Anatomy**: it is the science that studies the structures of the body.

\* **Gross anatomy**: is the anatomy that can be studied by the naked eye (without the aid of microscope), it is also called **macroscopic anatomy**.

For example: describing the liver (it has two lobes, its color is pink or reddish, its surface is smooth) using naked eye is gross anatomy.

\* **Histology**: it is the science that studies the tissues of the body using microscopes; it is also called **microscopic anatomy**.

- Types of tissues:

1. Epithelial tissue
2. Connective tissue (the bone is a connective tissue)
3. Muscular tissue
4. Nervous tissue

\* **Physiology**: is the study of the function of the body's structures.

\* For example:

While talking about lungs ....

Its shape and structure can be described by our naked eyes ... gross anatomy.

We can take a sample of its tissues and examine it using microscope ...

Histology.

Studying the function .... Physiology.

- Histology studies the normal tissue of the structures in the body because if there is a disease in the structure, the tissue will be abnormal ... then, this abnormality can be studied by pathologists.

\* **Pathology**: is the science that studies the disease of the structures of the body.

- So pathologist must study the normal cases (histology) to be able to diagnose the abnormalities.

Gross anatomy:

1. Regional anatomy: studied by parts.

2. Systematic anatomy: studied by systems.

3. Surface anatomy: study of internal structures as they relate to the overlying skin. (For example: surface anatomy of diaphragm ... it lies at the level of the nipple of the breast)

\* Histology: study of tissues

\* Cytology: study of the cell



\* The functional and structural unit of the body is the cell.

\* **Embryology**: study the developmental changes of the body of the embryo before birth.

- The zygote is formed in the ampulla of the fallopian tube and then moves through the fallopian tube toward the uterus ... the implantation happens in the posterior wall of the body of the uterus.

- The embryo spends 40 weeks (9 months) in the uterus ... but the most important changes are those happened during the first 12 weeks (first 3 months).

\* **Pathological anatomy:** is the study of the structural changes caused by disease.

\* **Radiographic anatomy:** is the study of the structures visualized by x-rays.

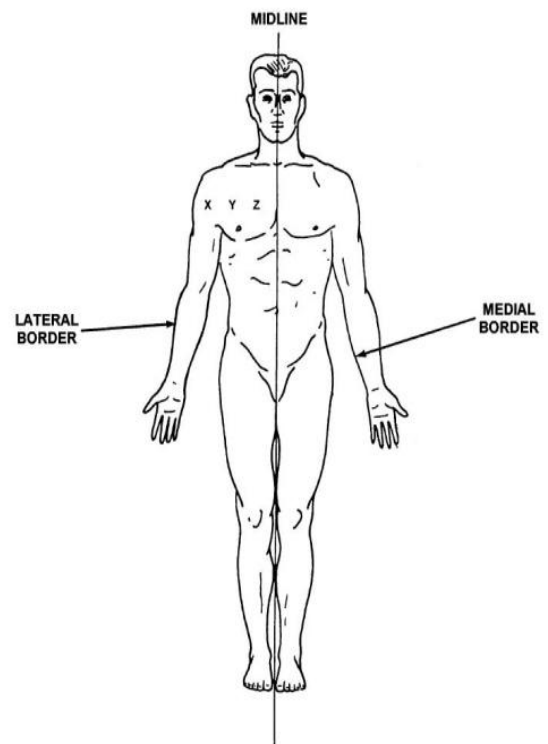
\* **Molecular anatomy:** is the study of anatomical structures at the sub-cellular levels.

## Positions

1. Anatomical position.
2. Supine position: lying on the back
3. Prone position: lying face down

### \* **Anatomical position:**

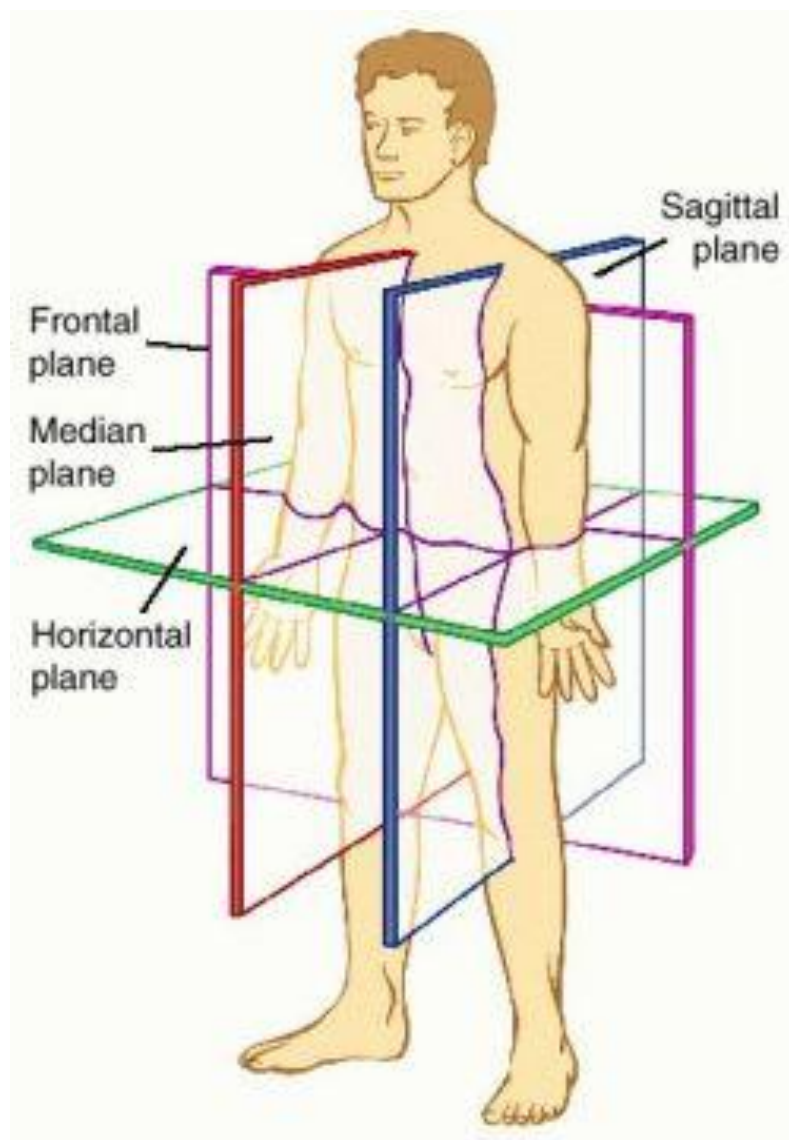
- standing erect.
- Upper limbs by the sides.
- Feet on the ground and slightly separated.
- Face and the Palms of the hand directed forward.
- Thumbs point laterally.

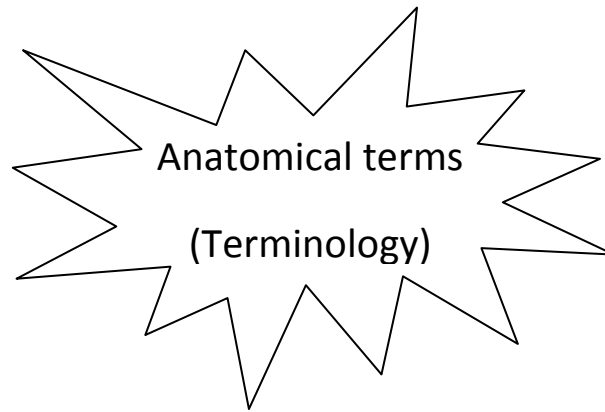


X is lateral to Y and Z; Y is medial to X and lateral to Z  
In the example shown, the body is in the normal anatomical position.

**\* Planes:**

1. Median sagittal plane: passes through the centre of the body and divide it into equal right and left halves.
2. Paramedian plane: divides the body into two unequal right and left parts, it is parallel to the median sagittal plane.
3. Horizontal (transverse) plane: divides the body into upper and lower parts.
4. Coronal (frontal) plane: divides the body into anterior and posterior parts.





- Superior : above الى الاعلى
- Inferior : below الى الاسفل
- Anterior : nearer to the front امامي
- Posterior : nearer to the back خلفي
- Palmar : the anterior surface of the palm of the hand
- Dorsal : the posterior surface of the palm of the hand
- Plantar : the lower surface of the foot
- Dorsal : the upper surface of the foot
- Lateral : away from the midline
- Medial : closer to the midline

Ulna is medial while radius is lateral.

- Proximal : closer to the origin
- Distal : farther from the origin

Elbow joint is distal while shoulder joint is proximal.

- Internal : داخلي
- External : خارجي
- Ipsilateral : refers to the same side of the body
- Contralateral : refers to opposite sides of the body

\* **Joint:** a site where two or more bones come together.

\* Joints are important for movement.

\* If the muscle passes above a joint, it will cause flexion.

If the muscle passes under a joint, it will cause extension.

\* Joints are 3 types:

1. Some joints have a free movement ... Such as the shoulder joint.

2. Some joints have slightly movement .... Such as the joints between ribs and sternum.

3. Some joints have no movement .... Such as the joints between the bones of the skull.

Terms of movement:

- Flexion
- Extension
  
- Abduction: move away from the median sagittal plane.
- Adduction: move toward the median sagittal plane.
  
- Supination : palms upward
- Pronation : dorsal part of the hand upward
  
- Thumb has an opposition movement.
  
- Medial rotation
- Lateral rotation
  
- Inversion: sole directed inwards.
- Eversion: sole directed outward.
  
- Circumduction

## Regional terms

- Axial skeleton: skull , vertebral column , thoracic
- Appendicular: bones of the upper limbs and the lower limbs.

### \* Cavities:

#### 1. Posterior

Cranial cavity which contains the brain.

Vertebral cavity which contains the spinal chord.

#### 2. Anterior

Thoracic cavity .... Diaphragm separates the thoracic and abdominal ...

\* Pelvic cavity is connected to the abdominal cavity...

\* Thoracic cavity is separated from the abdominal cavity by diaphragm...

\* We must know the organs that exist in each cavity...

\* For example: pelvic cavity contains:

(Urinary bladder, reproductive organs ...)



# Bones

\* Bone is a hard connective tissue.

\* Functions of bones:

1. Make the skeleton of the body: gives the shape and support.
2. Storage of elements especially calcium.
3. Muscle attachment: each muscle has an origin and insertion in the bones.

- What we should know about each muscle is:

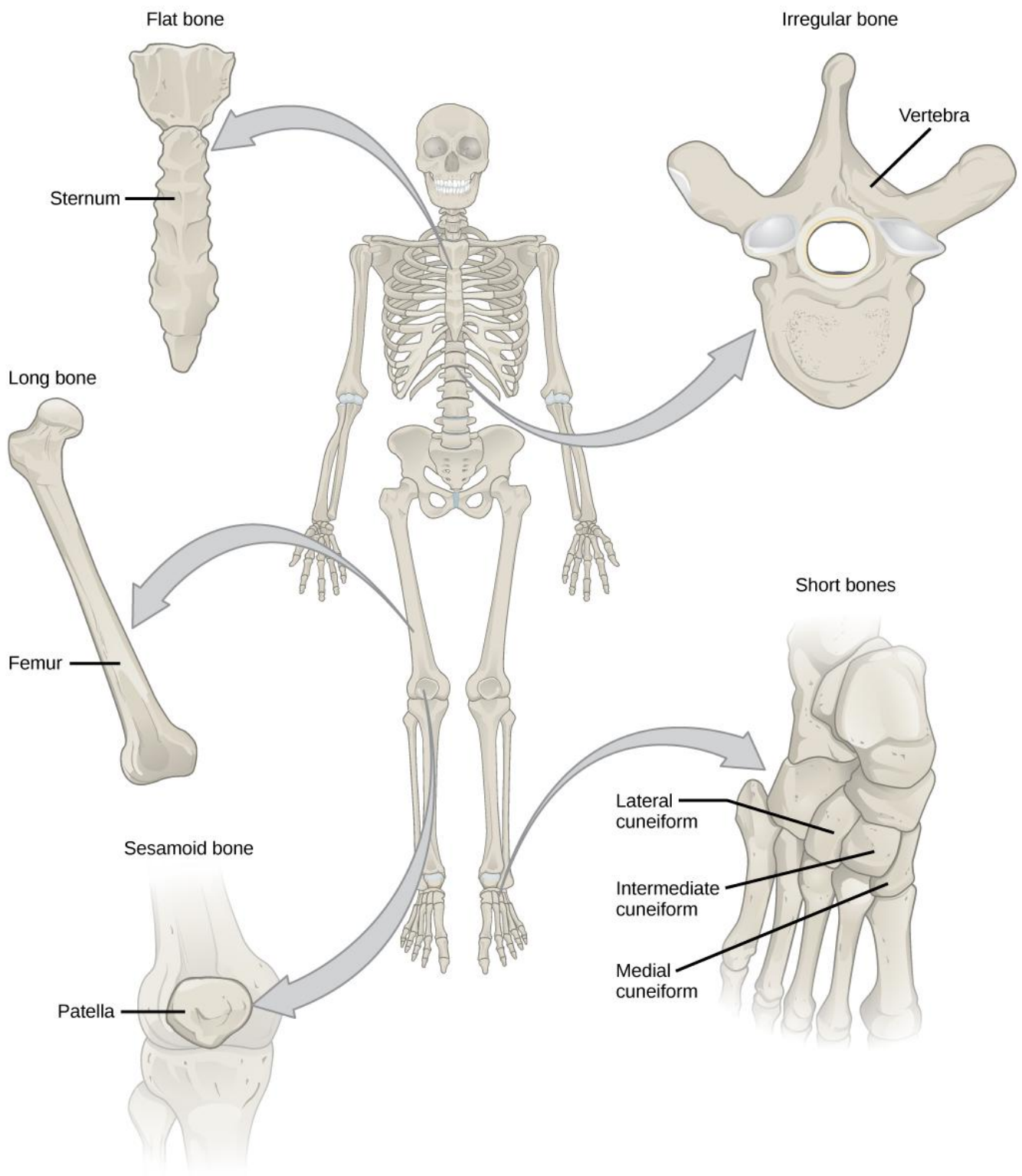
(1- Origin    2- Insertion    3- Nerve supply    4- Action)

\* Surface markings of the bones are important for muscle attachment.

\* **Types of bones:**

1. Long bones .... Humerus, femur, metacarpals, and phalanges.
2. Short bones ... carpals (trapezoid, scaphoid ...)
3. Irregular bones ... vertebrae, scapula, and pelvic bones
4. Flat bones ... scapula, skull, and sternum
5. Sesamoid ... patella, which is located in the tendon of the quadriceps femoris

\* Scapula is flat and irregular...



**\* Regional classification of bones:**

1. Axial skeleton (consist of 80 bones)
2. Appendicular skeleton (upper and lower limbs = 126 bones)

**\* Clavicle:**

- has 2 surfaces, 2 ends, 2 borders

**\* Scapula:**

- It is a flat bone that is important in the muscle attachment.
- Glenoid cavity is covered by hyaline cartilage.
- has 2 surfaces, 2 angles, 2 borders, 2 processes (coracoid and acromion)

**\* Humerus:**

- has a head covered with hyaline cartilage because it makes the shoulder joint.
- It is a long bone which has a proximal end, shaft, and distal end which is connected to the elbow joint and has trochlea, capitulum, coronoid fossa, olecranon fossa, radial fossa.

**\* Radius:**

- It has head, neck, proximal end, shaft, radial tuberosity (which contains the insertion of the biceps tendon), and distal end (which makes the articulation with two carpal bones: scaphoid bone and lunate bone).
- The lateral side of the radius: radial styloid process.

**\* Ulna:**

- has a trochlear notch in the elbow joint.
- has 2 processes: olecranon and coronoid.
- Distal end: styloid process and head of ulna.

**\* Carpal bones:**

- They are 8 bones... Arranged in 2 rows:

From lateral to medial

1<sup>st</sup> row (proximal): the scaphoid, lunate, triquetral, and pisiform bones.

2<sup>nd</sup> row (distal): the trapezium, trapezoid, capitate, and hamate bones.

**\* Metacarpals:**

- They are 5 bones...
- Each has a head, shaft, and a base.

**\* Phalanges:**

- They are short of long bones.
- Each has a head, shaft, and base.
- Each finger has a distal, middle, and proximal phalanges **except** for the thumb that has proximal and distal phalanges only.

Good luck 😊