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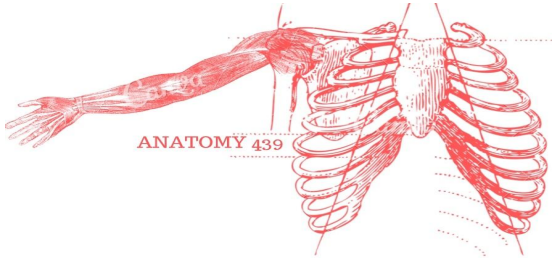
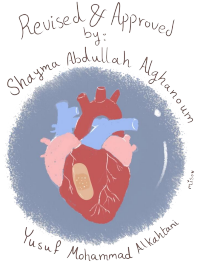
Lecture 1:



INTRODUCTION TO ANATOMY AND SKELETAL SYSTEM

- Red : important
- Pink : in girls slides only
- Blue : in male slides only
- Green : notes, Extra



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Objectives:

- Define the word **Anatomy.**
- Enumerate **the different anatomical fields.**
- Describe **the anatomical positions.**
- Describe different **anatomical terms of position** & **movements** as well as different **anatomical planes**.
- Classify bones according to **shape**, **structure** & **development.**
- Enumerate different bones of both **axial** & **appendicular** skeleton.

WHAT'S ANATOMY?

The word anatomy is of Greek origin meaning cutting up (ana= up; tome= cutting).

ANATOMY : is the study of the structure & shape of the body parts & their relationship to one another. (source: team 438)

1.Gross Anatomy: Study of human body with **Naked Eye** **(Morphology)**
2. Microscopic Anatomy(Histology): Study of **FINE STRUCTURE** (cells & tissues) of the human body with the help of Microscope.
3. Developmental Anatomy (Embryology)
4. Radiological Anatomy
5. Surgical Anatomy
6. Cross-sectional Anatomy (source: team 438)
7. Applied Anatomy
8. Surface Anatomy

ANATOMICAL POSITION

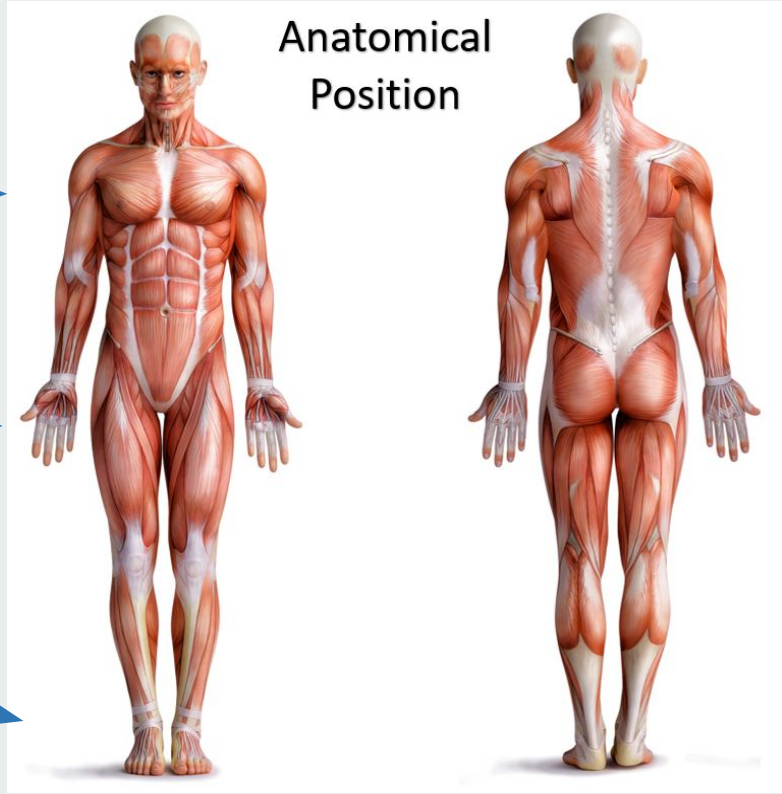
Its the **standard position** in which the body assume to describe its parts.

1- Body is **erect**

2- Arms are **hanging by the side**

3- Palms are **facing forward**

4- Feet are **parallel**



ANATOMICAL TERMINOLOGY

Terms of position

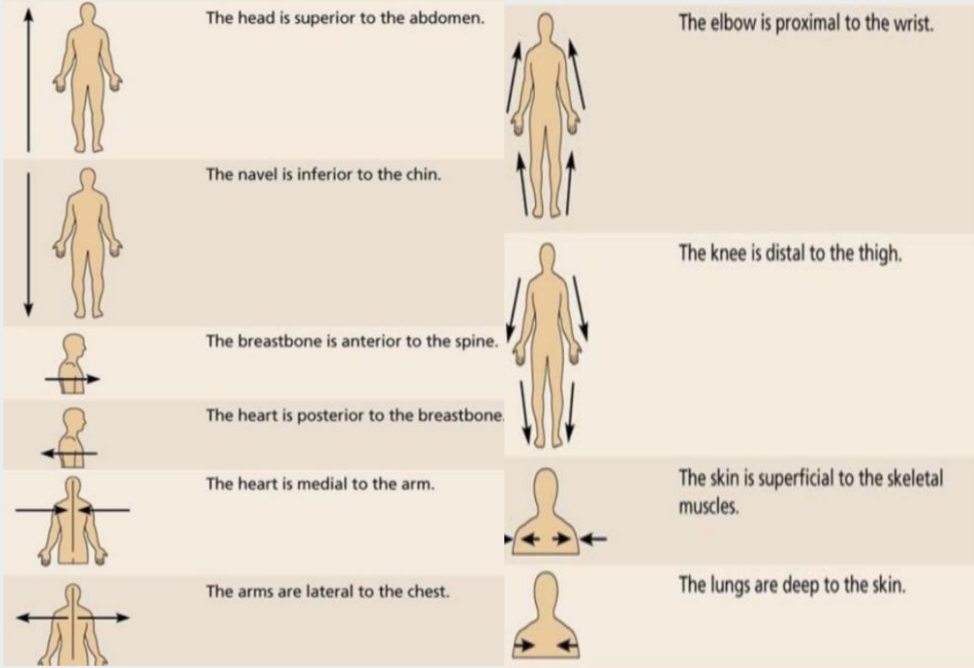
- **Superior (cranial) upper**: near to head.
- **Inferior (caudal) lower**: away from the head.

- **Anterior (ventral):** near to front.
- **Posterior (dorsal):** near to back.

- **Medial:** near to median plane.
- **Lateral:** away from median plane.

- **Proximal:** near to trunk (axial body).
- **Distal:** away from trunk (axial body).

- **Superficial:** near to surface (skin).
- **Deep:** away from surface (skin).



For more understanding:

1-https://youtu.be/KqgTERrYbQ4

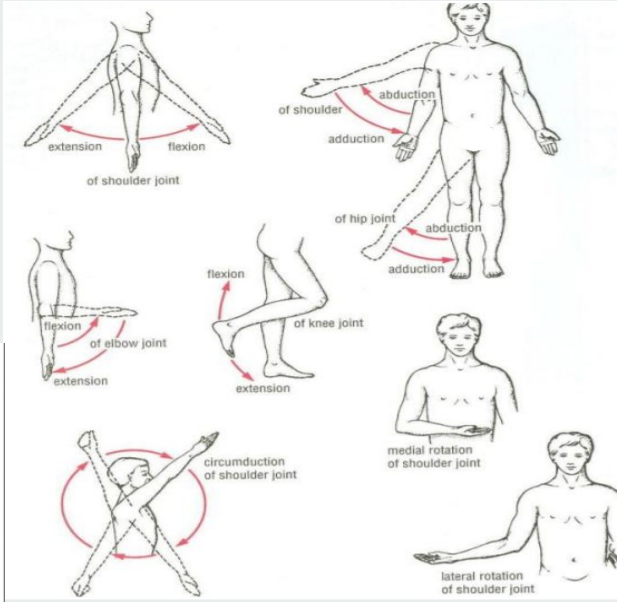
2-https://www.youtube.com/watch?v=TmYg8s_8vDk

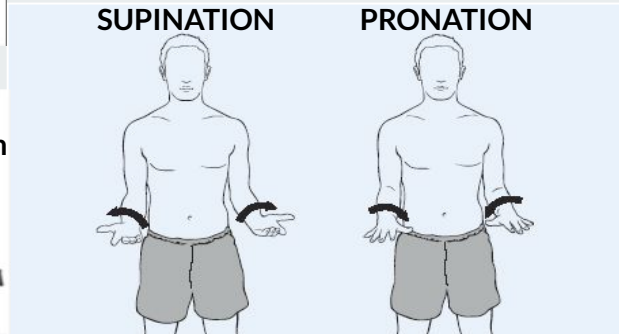
ANATOMICAL TERMINOLOGY

Terms of movement

- **Flexion:** approximation of 2 parts (decreasing the angle between 2 part).
- **Extension:** straightening (increasing the angle between 2 parts).
- **Abduction:** away from median plane.
- **Adduction:** toward median plane. *Adduction: it's like adding your arms to your body*
- **Supination:** the outward rotation of the hand.
- **Pronation:** the inward rotation of the hand.
- **inversion:** the inward rotation of the foot.
- **eversion:** the outward rotation of the foot.
- **Lateral rotation:** rotation away from the median plane.
- **Medial rotation:** rotation toward the median plane.
- **Circumduction:** the combined movements of Flexion, Extension, Abduction & Adduction

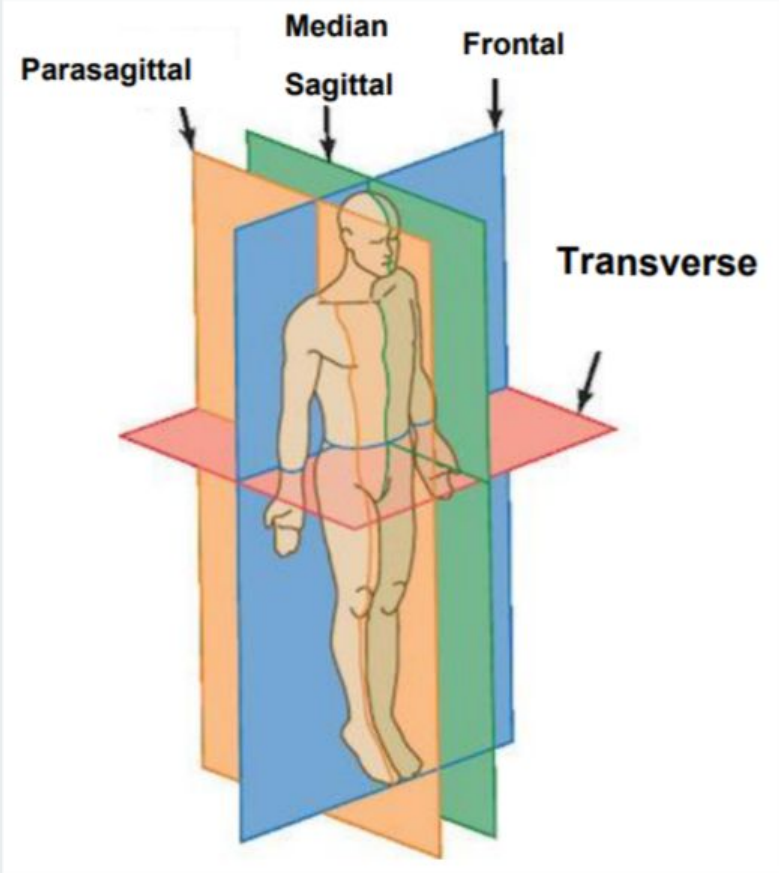
For more understanding: https://www.youtube.com/watch?v=zkL6r9hi86A



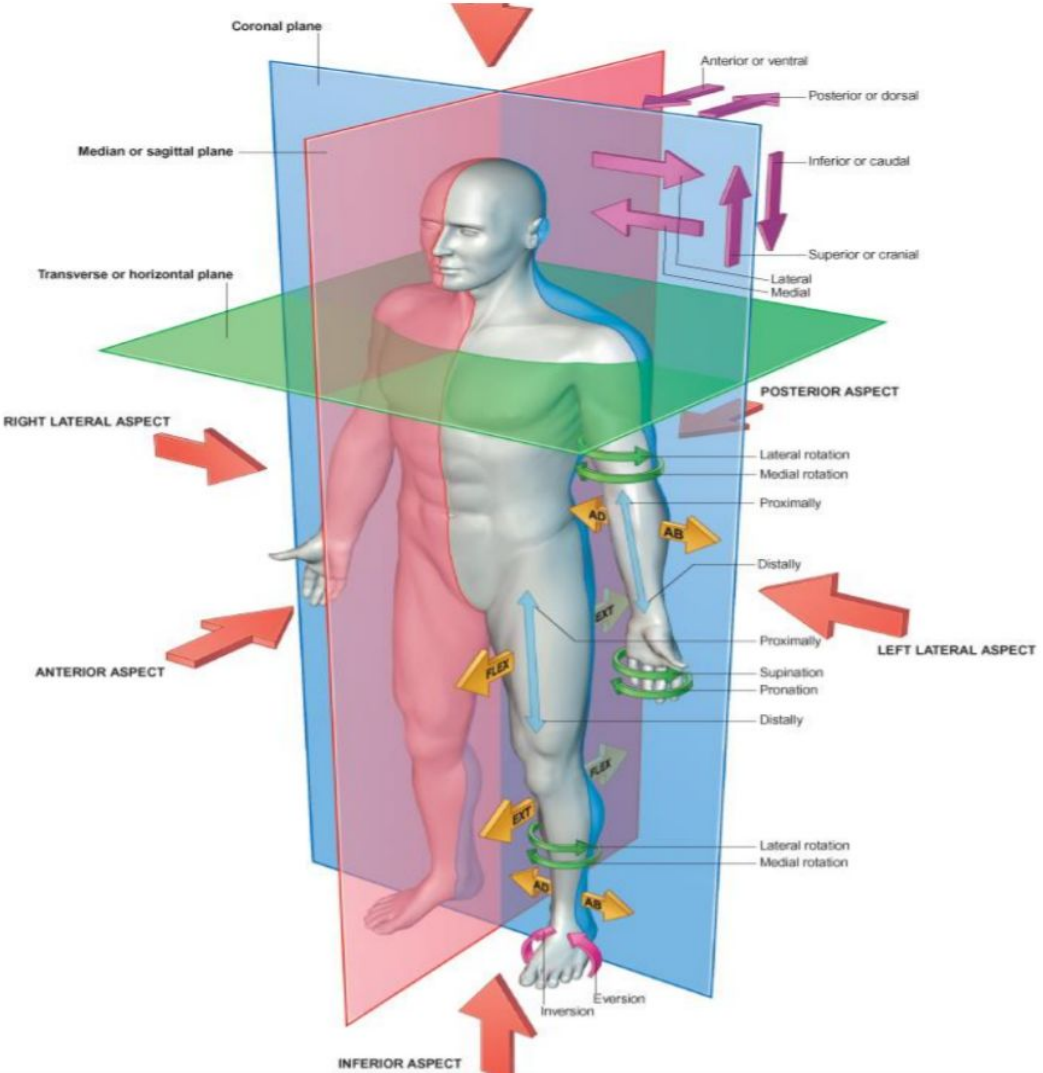


ANATOMICAL PLANES & SECTIONS

- **Sagittal (median):** divides the body into 2 **equal** halves (left & right).
- **Parasagittal (paramedian):** divides the body into 2 **unequal** parts (left & right).
- **Coronal (frontal):** divides the body into **anterior** & **posterior** parts.
- **Transverse (cross) (horizontal):** divides the body into **superior** & **inferior** parts.



SUMMARY OF PLANES, TERMS OF POSITION & TERMS OF MOVEMENT



BODY CAVITIES

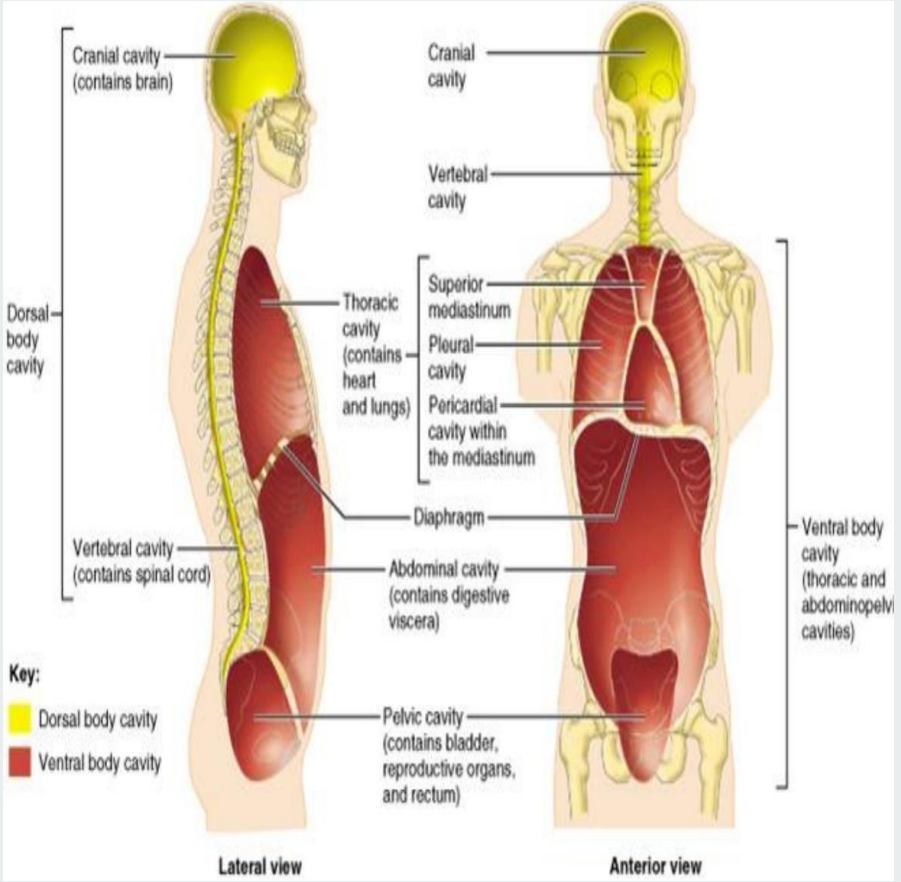
There are two body cavities:

1- Ventral body cavity: divided by diaphragm (الحجاب الحاجز) into:

- **Thoracic cavity (التجويف الصدري): superior to diaphragm, contains heart & lungs.**
- **Abdominal cavity: inferior to diaphragm, contains stomach, intestine, liver, urinary bladder, etc…**
  Abdominal cavity is also called abdominopelvic cavity.

2- Dorsal body cavity: divided into two parts **continuous** with each other:

- **Cranial cavity (تجويف الجمجمة): space inside skull, contains brain.**
- **Spinal cavity: space inside vertebral column contains the spinal cord**



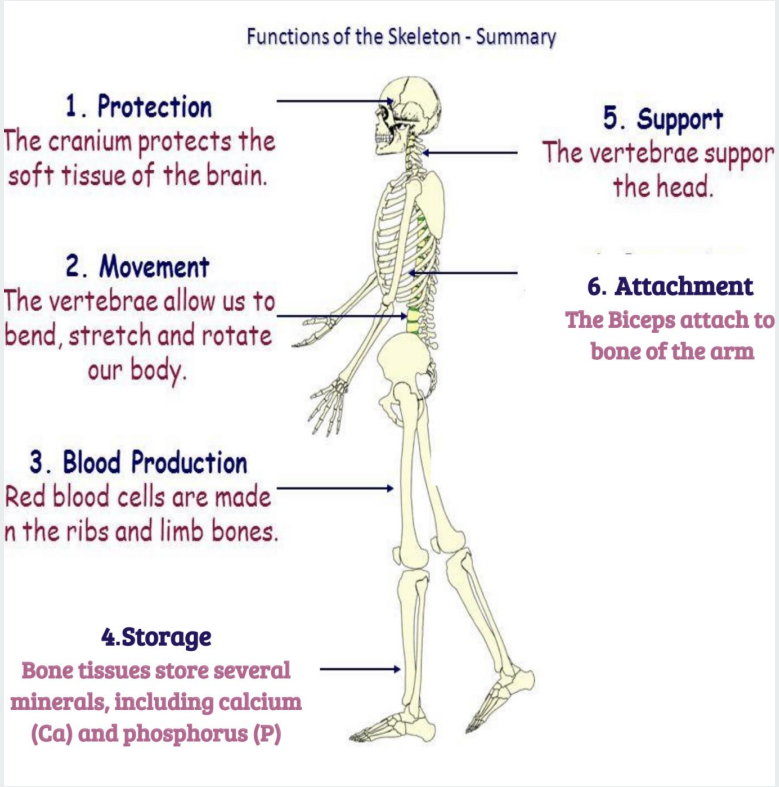
Skeletal system

The skeletal system includes:

- **Bones**
- **Joints:** The articulations between bones.

Functions of bone:

- **Support:** of the body.
- **Storage:** of fat and minerals (e.g. calcium and phosphorus).
- **Protection:** of soft body organs.
- **Attachment:** of muscles.
- **Movement:** of the body as a whole, or of the body parts.
- **Blood cell formation, IN THE BONE MARROW.**



Classification of bone

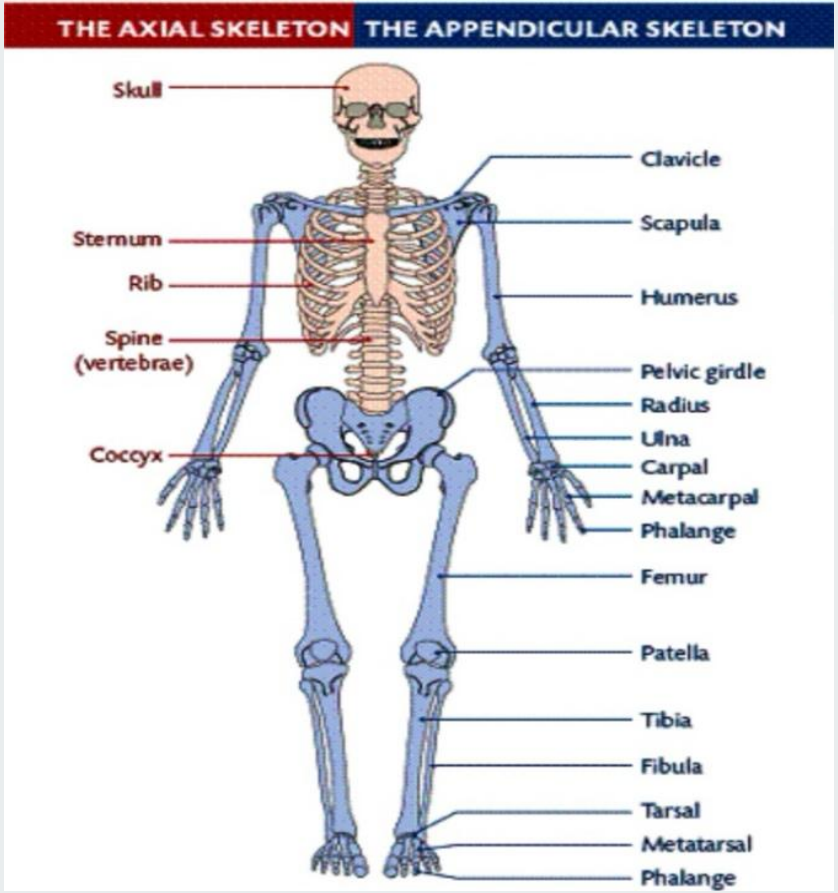
Bones are classified on the bases of their:		
Shape	**Structure**	**Development**
• **Long bone:** femur, humerus tibia,fibula,clavicle, metatarsals and metacarpals. • **Short bone:** carpal & tarsal bones. • **Irregular bone:** vertebrae, sacrum. • **Flat bone:** sternum,skull and scapula { كلها تبدأ بال s } • **Sesamoid bone:** patella. • **Pneumatic bone:** sphenoid, ethmoid bone, temporal bone, paranasal sinuses.	• **Compact bone** • **Spongy bone**	• **Membrane or membranous bones (عظم غشائي):** these bones ossify in membrane. • **Cartilage or cartilaginous bones (عظم غضروفي):** these bones ossify in cartilage, for example, nose and ear. **Note: ossify = turn to bone** (يتحول لعظم)

The skeleton

The skeleton, which is formed of 206 bones is divided into:

1- Axial skeleton (الهيكل المحوري)**:** bones forming the **trunk (الجذع)** (longitudinal axis) of the body. 80 bones

2- Appendicular skeleton (الهيكل الطرفي)**:** bones forming the girdles (الأحزمة) & limbs (الأطراف). 126 bones



Bones of the axial skeleton

Skull

The skull consist of:

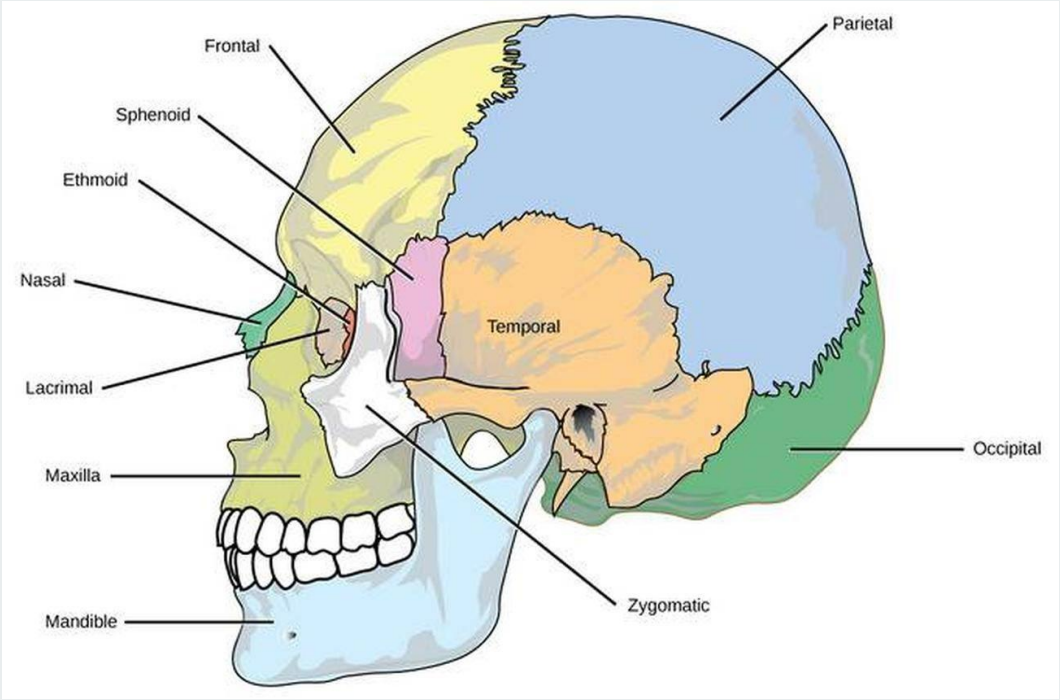
1- **cranium bones:** these bones enclose the brain:

Frontal
Occipital
Parietal (pair)
Temporal (pair)

2- **Facial bones:** these bones are the bones of the face:

Maxilla (pair)
Nasal (pair)
Zygomatic (pair)
Mandible (the only movable bone in the face)

Note: there are 22 bones in the skull 8 of which are paired.



Bones of the axial skeleton

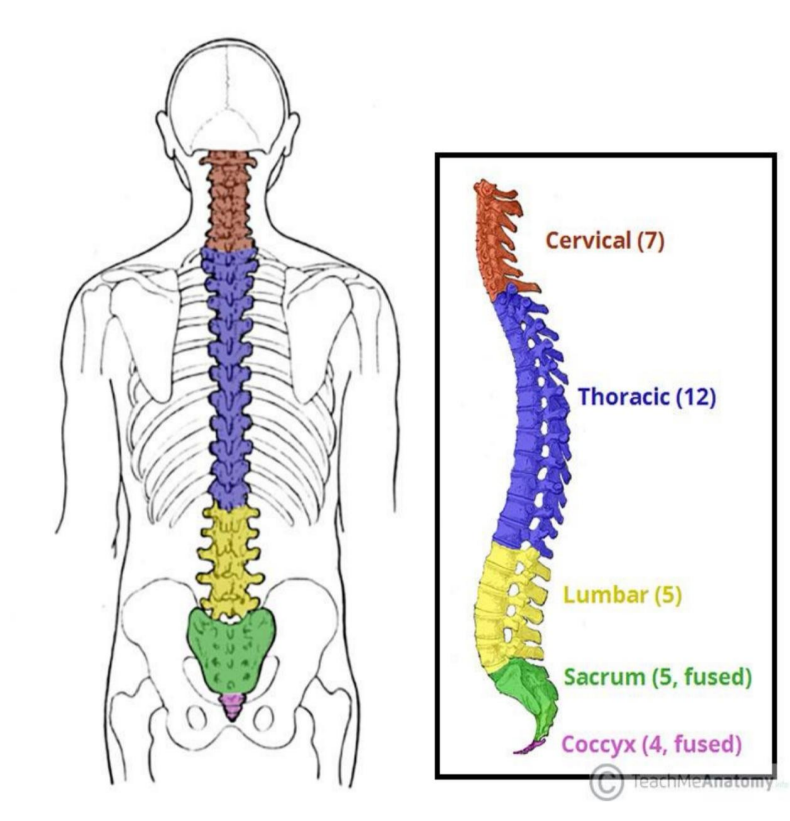
Vertebral column

The vertebral column consist of 33 bones (vertebrae).

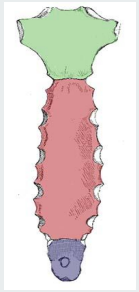
Functions: protects the spinal cord and supports the body.

Formed of:

- 7 cervical vertebrae Concave.
- 12 thoracic vertebrae Convex.
- 5 lumbar vertebrae Concave.
- 5 sacral vertebrae **fused** to form sacrum Convex.
- 4 coccygeal vertebrae **fused** to form coccyx (العصعص).



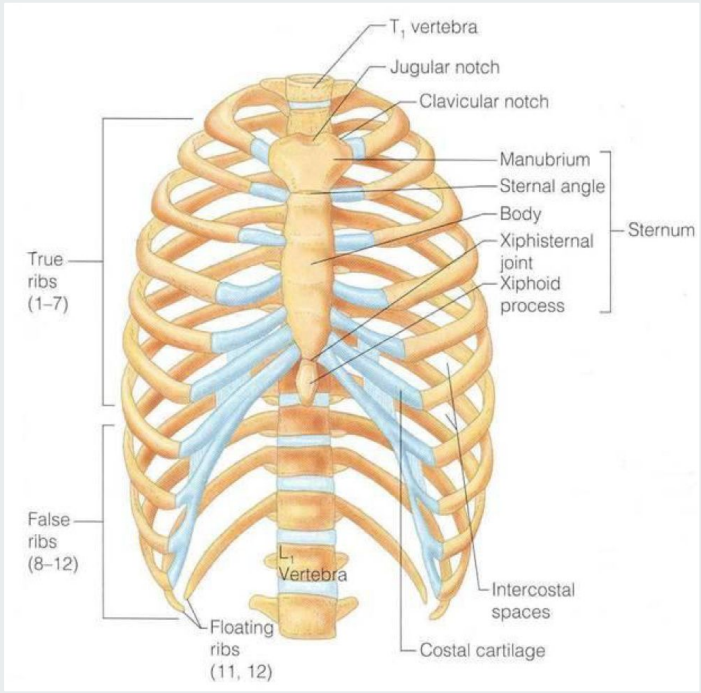
Bones of Axial Skeleton



The sternum (عظمة القص)

Consists of 3 parts :

. Manubrium
. Body
. Xiphoid process



The Ribs (الأضلاع)

There are 12 pairs of ribs

*(All **ribs** articulate with the vertebrae) posterior.*

*The first **7 ribs** called "**true ribs**"*
because they articulate with the sternum directly.

*The **8th ,9th, and 10th** ribs are called "**false ribs**"*
*because they **do not** articulate with the sternum directly,*
but are connected to the 7th rib by cartilage.

*The **11th and 12th** ribs are called "**floating ribs**"*
CONSIDERED FALSE RIBS because they are attached
only to the vertebrae and not to the sternum or cartilage of the sternum.

Bones of Appendicular Skeleton

Pectoral (shoulder) Girdle:

*It connects the **upper limb** with axial skeleton.*
Formed of :

- *Clavicle (الترقوة)*
- *Scapula*

*(**2 bones** on each side)*

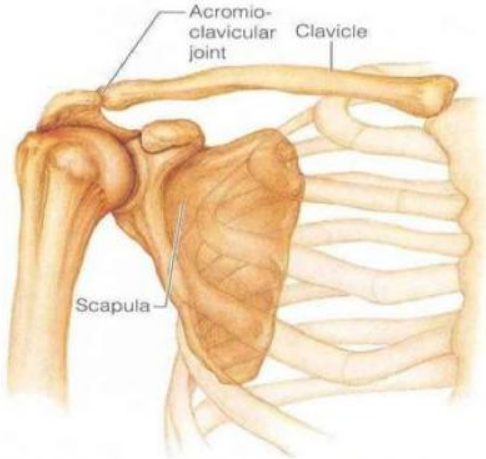
.....

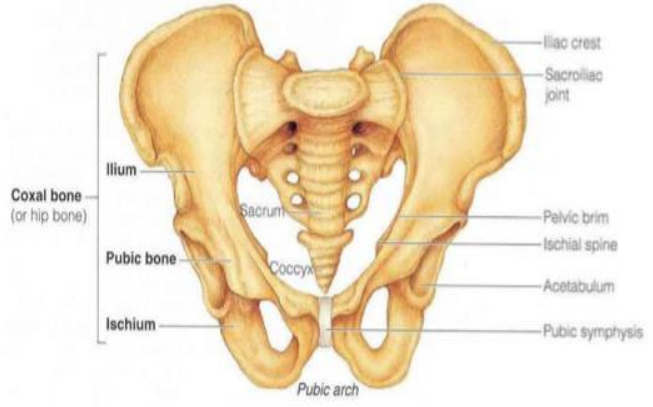
Pelvic Girdle:

*It connects the **lower limb** with axial skeleton.*
Formed of :

- *Hip bone*

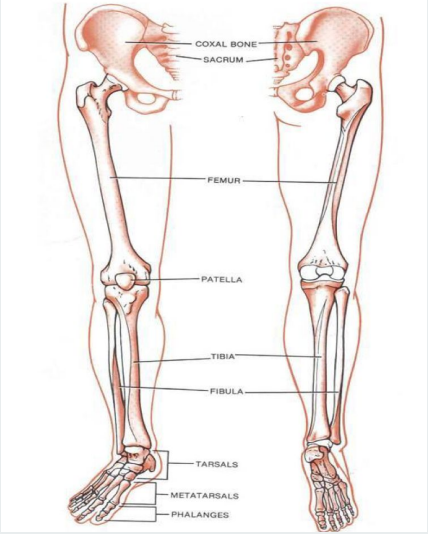
*(**Only one** on each side)*





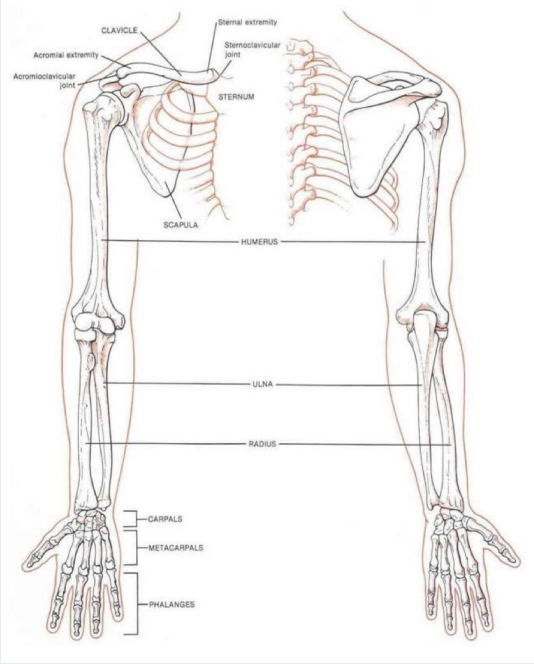
Bones of Appendicular Skeleton

The lower limb:



- Bone of **thigh**:
  Femur
- Bones of **leg**:
  Fibula (lateral)
  Tibia (medial)
  Patella (infront of the knee)

The upper limb:



- *Bone of **arm**:*
  humerus
- *Bones of **forearm**:*
  Radius (lateral)
  Ulna (medial)

- Bones of the **foot**:

7 Tarsals	5 Metatarsals bones	14 phalanges
Bones in 2 rows	Counting starts from medial to lateral. (Starting from the big toe)	*3 for each of the 4 lateral toes & 2 for big toe*

- *Bones of the **hand**:*

8 Carpals	5 Metacarpals bones	14 phalanges
Bones in 2 rows	Counting starts from lateral to medial (starting from the thumb)	*3 for each of the 4 medial fingers & 2 for thumbs*

Long bones

Formed of :

- ***A Shaft (diaphysis)***

Composed of compact bone.

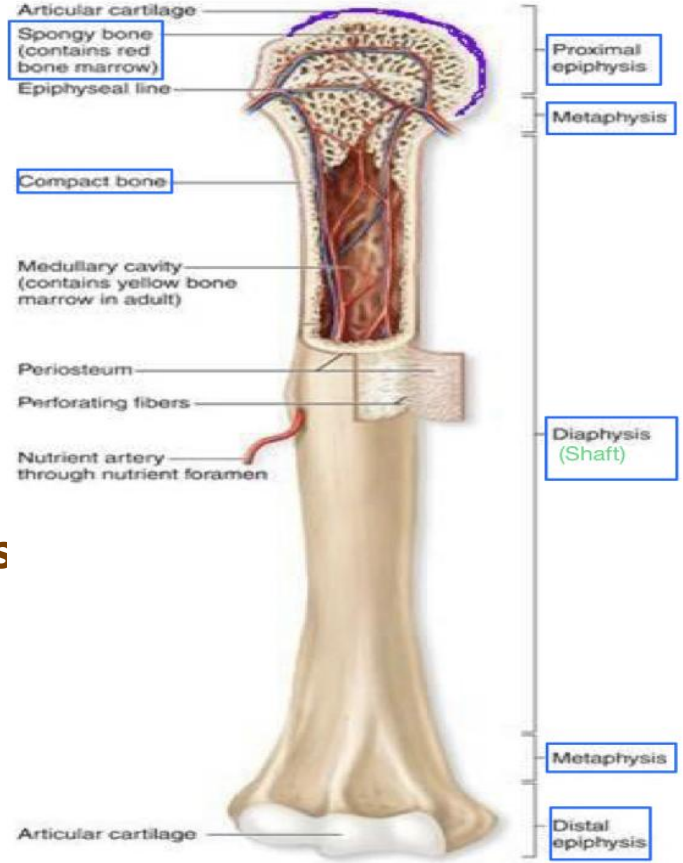
- ***2 ends (epiphysis)***

Composed of spongy bones.

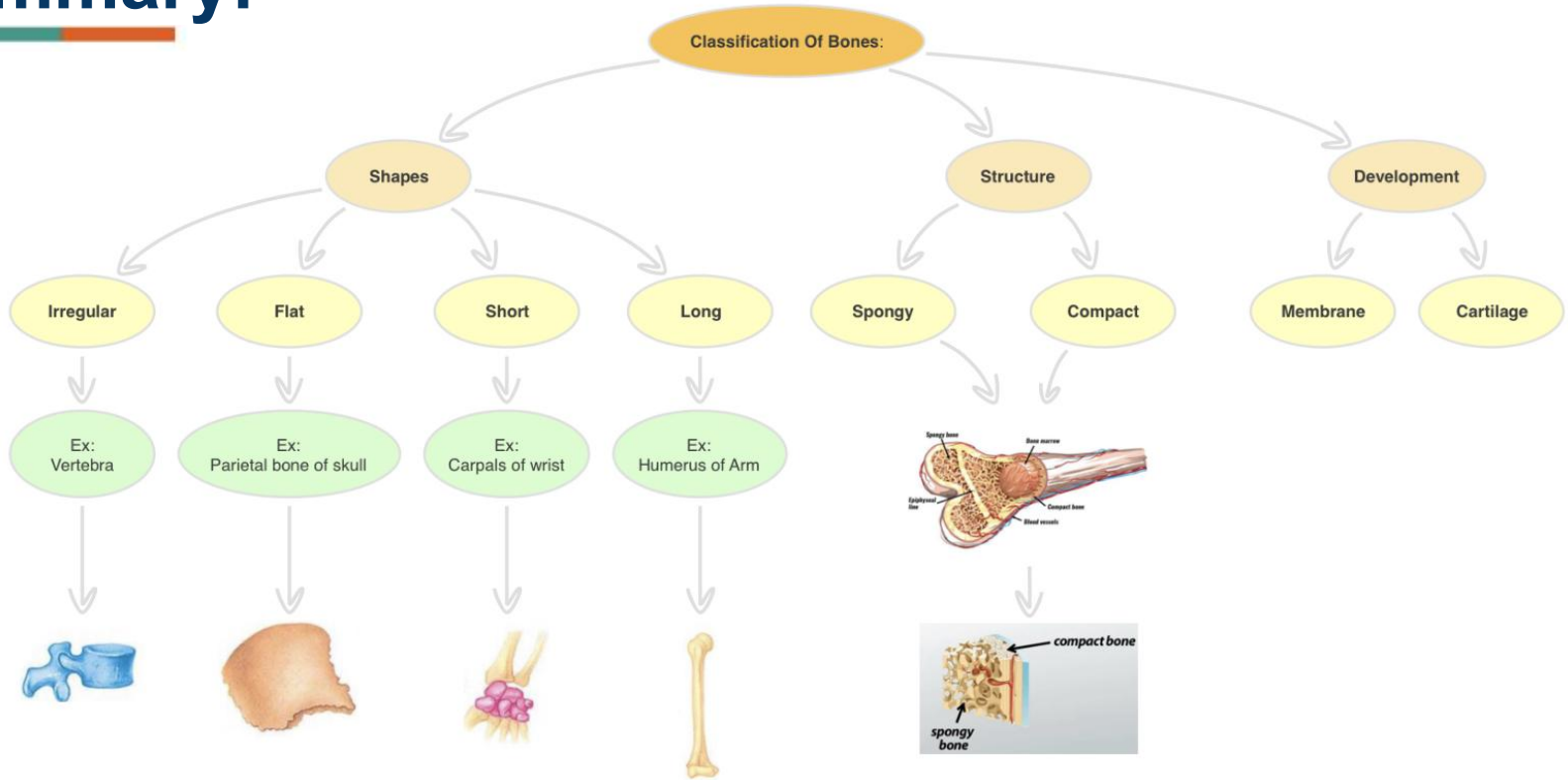
- ***Metaphysis***

*The region of contact between **epiphysis** & **diaphysis***

*Contains **epiphyseal plate of cartilage***
responsible for <u>linear</u> bone growth



Summary:


Classification Of Bones:
Shapes
Structure
Development
Irregular
Flat
Short
Long
Spongy
Compact
Membrane
Cartilage
Ex:
Vertebra
Ex:
Parietal bone of skull
Ex:
Carpals of wrist
Ex:
Humerus of Arm
compact bone
spongy bone

MCQs

1- Study of the structure and morphology of the tissues and organs of the body based on their x- ray visualization is:

A- Microscopic Anatomy (HISTOLOGY)	B- Radiological Anatomy	C- Surgical anatomy

2- Increasing the angle between 2 parts in the body:

A- Flexion	B- Abduction	C- Extension

3- Name the lateral bone in the forearm:

A- Ulna	B- Humerus	C- Radius

4- The meeting point between epiphysis And diaphysis is called:

A- Epiphyseal plate of cartilage	B- Metaphysis	C- Femur

Answers

1- B
2- C
3- C
4- B

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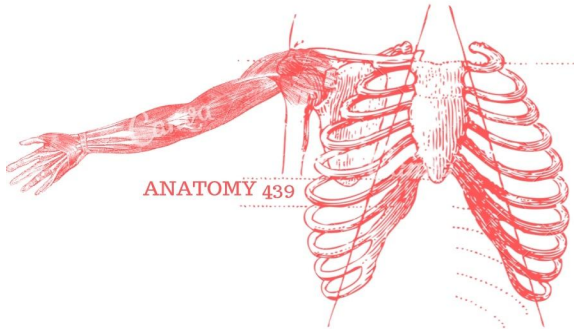

Team members:

الاء السلمي	التوبم	بدر الريس
جود النجيدي		خالد العصيمي
دعاء الحمودي	العميريني	عبدالعزيز الغليقه
رند الرفاعي		نواف السعدي
ريما الهدلق		عبدالله المزروع
ساره العيدروس		راكان الدوهان
ساره القويز		محمد السنيدي
سديم آل زايد		
عبير عواد		

Team leaders:

مياسم الحازمي فهد العجمي

Contact us:
Anatomy439@gmail.com