

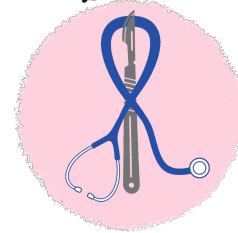
Lecture 1:



Introduction to Anatomy and Skeletal System

- Main text
- Red : Important
- Pink : in girls slides only
- Blue : in boys slides only
- Green : Doctors Notes
- Grey : Extra info

Revised & Reviewed
by
Abdulaziz & Bahammam
Faye Wael Sendi



MED441
KING SAUD UNIVERSITY

Objectives

At the end of the lecture , students should be able to:

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

WHAT IS ANATOMY?

The word **Anatome** is of **Greek** origin meaning **cutting up** (ana= up; tome= cutting).
Anatomy can be defined as the study of the **shape & structure** of the body parts.

- **Gross (macroscopic) anatomy:** Study of human body with **naked eye**.
- **Microscopic anatomy; (Histology):** Study of **fine structure** (cells & tissues) of the human body with the help of **microscope**.
- **Developmental anatomy; (Embryology).**
- **Radiological anatomy:**The study of the body and its organs and tissues using **x-ray imaging**.
- **Applied anatomy:** **application** of anatomical knowledge,, in the diagnosis and treatment of disease.
- **Surface anatomy:** **superficial** anatomy, without dissection.
- **Surgical anatomy:** study of the structure and morphological characteristics of the tissues and organs of the body as they relate to **surgery**.

ANATOMICAL POSITION

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

1-Body is **erect**



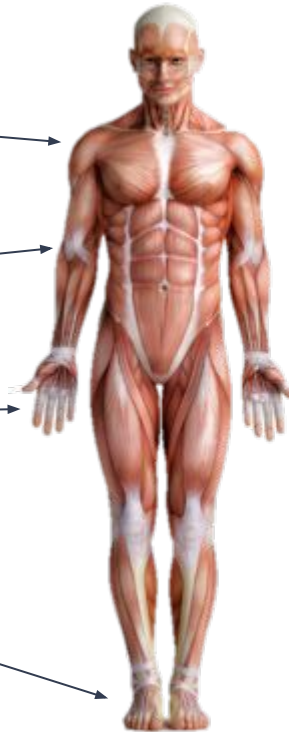
2-Arms **hanging by the side**



3-Palms **facing forward**



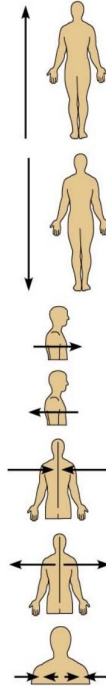
4-Feet are **parallel**



ANATOMICAL TERMINOLOGY

TERMS OF POSITION:

- **Superior/cephalic (cranial):** near to head.
- **Inferior (caudal):** away from 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.
- **Distal:** away from trunk.
- **Superficial:** near to skin (surface).
- **Deep:** away from skin.



The head is superior to the abdomen

The navel is inferior to the chin

The breastbone is anterior to the spine

The heart is posterior to the breastbone

The heart is medial to the arm

The arms are lateral to the chest

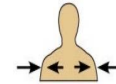
The collarbone is intermediate between the breastbone and shoulder



The elbow is proximal to the wrist



The knee is distal to the thigh



The skin is superficial to the skeletal muscles



The lungs are deep to the skin

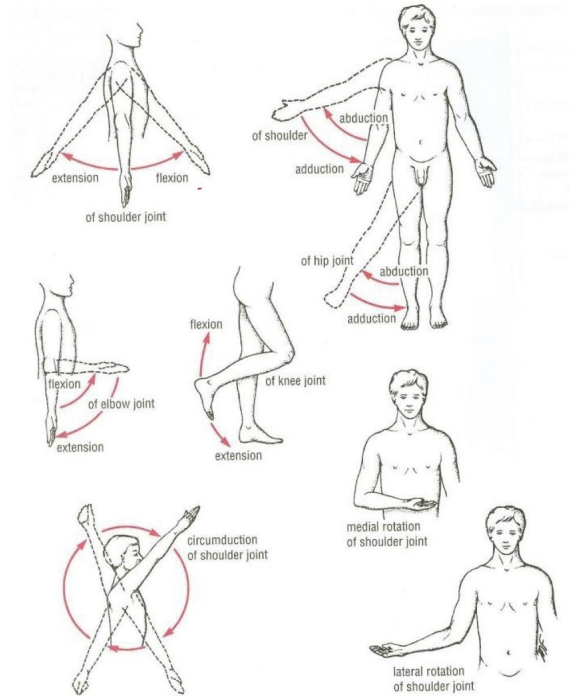


[Helpful video](#)

ANATOMICAL TERMINOLOGY

TERMS OF GENERAL MOVEMENT:

- **Flexion:** **approximation** of 2 parts (**decreasing** the angle between 2 parts).
- **Extension:** **straightening** (**increasing** the angle between 2 parts).
- **Abduction:** **away** from median plane.
- **Adduction:** **toward** median plane.
- **Lateral rotation:** rotation **away** from median plane.
- **Medial rotation:** rotation **toward** median plane.
- **Circumduction:** combined movements of flexion, extension, abduction & adduction.



SPECIAL MOVEMENT OF UPPER LIMB

Opposition

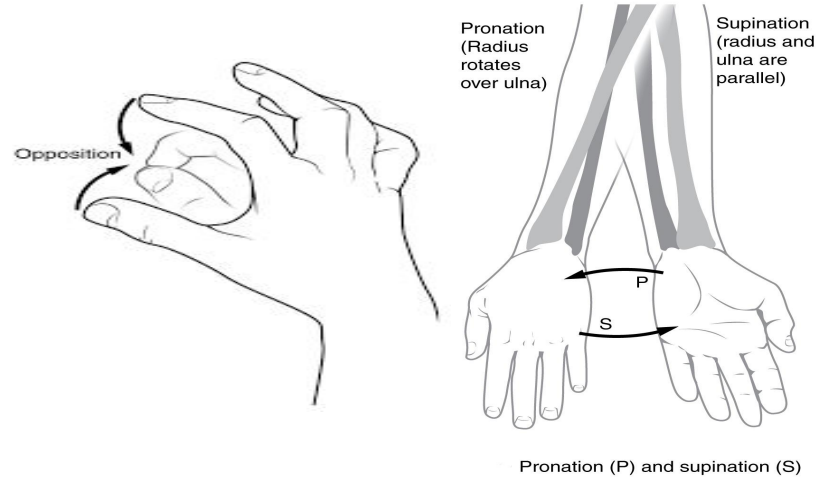
- Bringing **tips of fingers** and **thumb together** as in picking something up.

Supination

- Lateral rotation of the forearm.
- The palm faces Anteriorly.
- The **radius** and **ulna** are **Parallel**.

Pronation

- Medial rotation of the forearm.
- The palm faces Posteriorly
- The **radius** **Crosses** the **ulna** and the two bones form an X.



SPECIAL MOVEMENT OF LOWER LIMB

Dorsiflexion:

- Flexing the foot **up**.
- (Standing on the heels).

Plantar flexion:

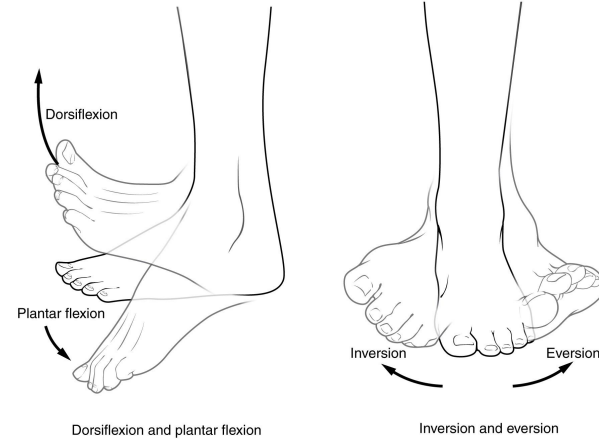
- Flexing the foot **down**.
- Movement with pointing the toes.

Inversion:

- The sole faces in a **Medial** direction.

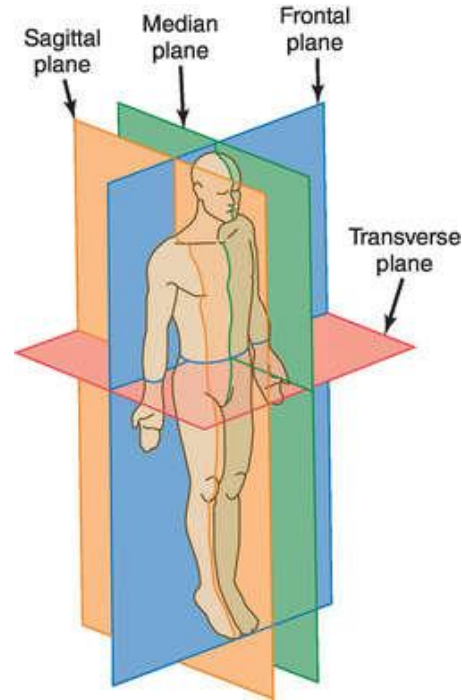
Eversion:

- The sole faces in a **Lateral** direction.



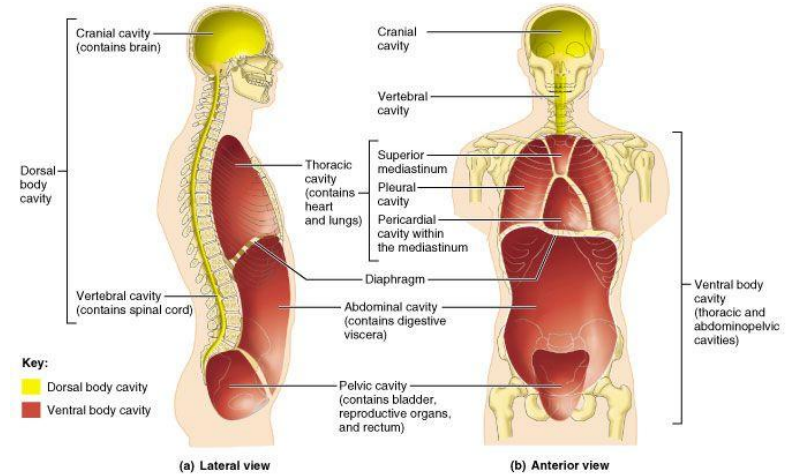
ANATOMICAL PLANES & SECTIONS

- **Sagittal / Longitudinal (median)**: divides the body into **2 equal** halves (right & left).
- **Parasagittal (paramedian)**: divides the body into **2 unequal** parts (right & left).
- **Frontal (coronal)**: divides the body into **anterior** & **posterior** parts.
- **Transverse / Horizontal (cross)**: divides the body into **superior** & **inferior** parts.

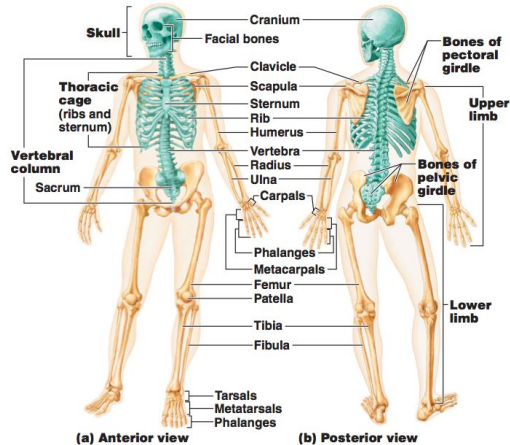
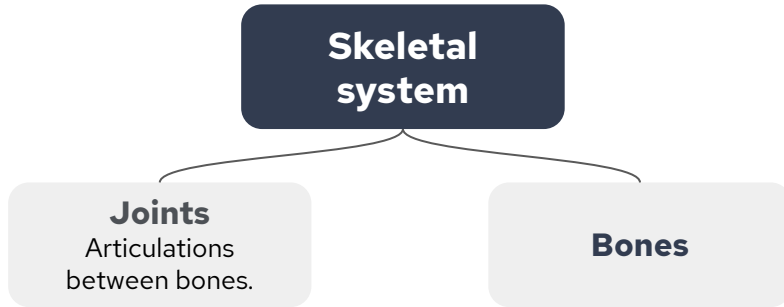


BODY CAVITIES

- **Ventral body cavity**: divided by **diaphragm** into:
 - 1. Thoracic cavity**: superior to diaphragm, contains heart & lungs.
 - 2. Abdominal cavity**: inferior to diaphragm, contains stomach, intestine, liver, urinary bladder, etc...
(abdominal cavity is also called **abdominopelvic cavity**)
- **Dorsal body cavity**: divided into 2 parts **continuous** with each other:
 - 1. Cranial cavity**: space inside skull, contains brain
 - 2. Spinal cavity**: space inside vertebral column, contains spinal cord



SKELETAL SYSTEM



Function of bones:

1. **Support:** of the body.
2. **Storage:** of fat and minerals e.g. calcium and phosphorus.
3. **Protection:** of soft body organs.
4. **Attachment:** of muscles.
5. **Movement:** of the body as a whole, or of the body parts.
6. **Blood cell formation in the bone marrow.**

CLASSIFICATION OF BONE

Bones classified by

Shape

Long bone: Femur, humerus, tibia, fibula, clavicle, metatarsals, and metacarpals.

Short bone: carpal and tarsal bones.

Flat bone: sternum, skull, and scapula.

Irregular bone: vertebrae, sacrum.

Structure

Compact

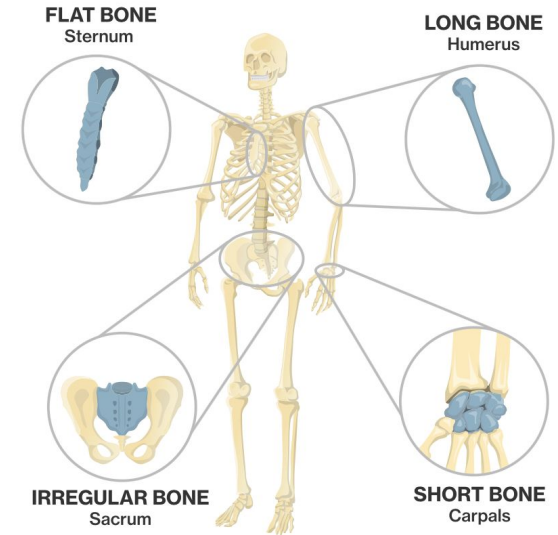
Spongy

Development

Membranous bone

Cartilaginous bone

Shapes of Human Bones

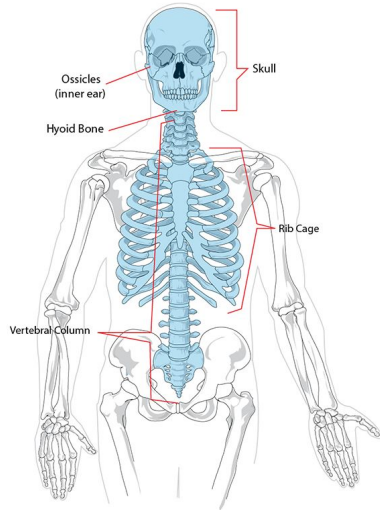


THE SKELETON

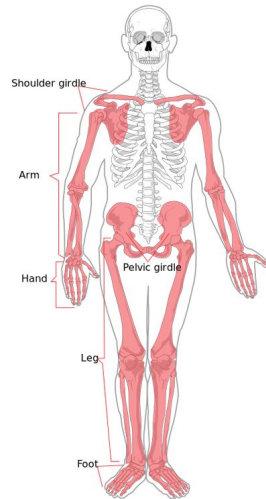
The skeleton is formed of **206** bones
The skeleton is divided into:

- **Axial skeleton:**
 - Bones of the trunk.
 - 80 bones.
- **Appendicular skeleton:**
 - Bones of the girdles and limbs.
 - 126 bones.

AXIAL SKELETON DIAGRAM



APPENDICULAR SKELETON DIAGRAM



The Skeleton

Axial

Skull

Vertebral column

Sternum

Ribs

Appendicular

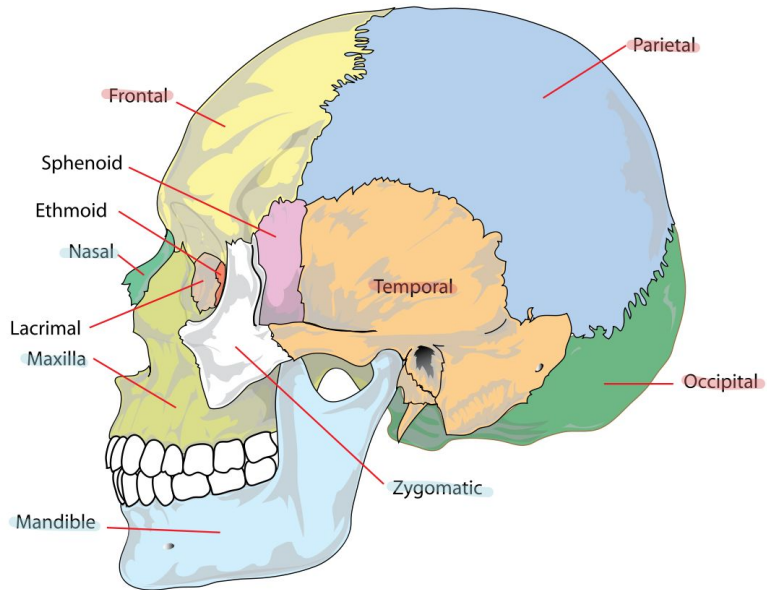
Pectoral girdle

Pelvic girdle

Upper limb

Lower limb

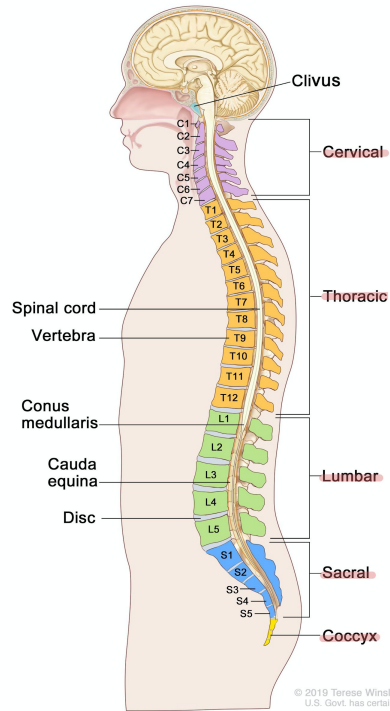
THE SKULL



The skull is divided into:

- **Cranium bones:**
(Bones enclosing brain)
 - Frontal
 - Occipital
 - Parietal (pair)
 - Temporal (pair)
- **Facial bones:**
(Bones of the face)
 - Maxilla (pair)
 - Nasal (pair)
 - Zygomatic (pair)
 - Mandible (The only movable bone in the skull)

THE VERTEBRAL COLUMN



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- **Number: 33** vertebrae
- **Function:** protects the spinal cord and supports the body
- **Formed of:**
 - **7** cervical
 - **12** thoracic
 - **5** lumbar
 - **5** sacral, fused to form sacrum
 - **4** coccygeal, fused to form coccyx

THE STERNUM & RIBS

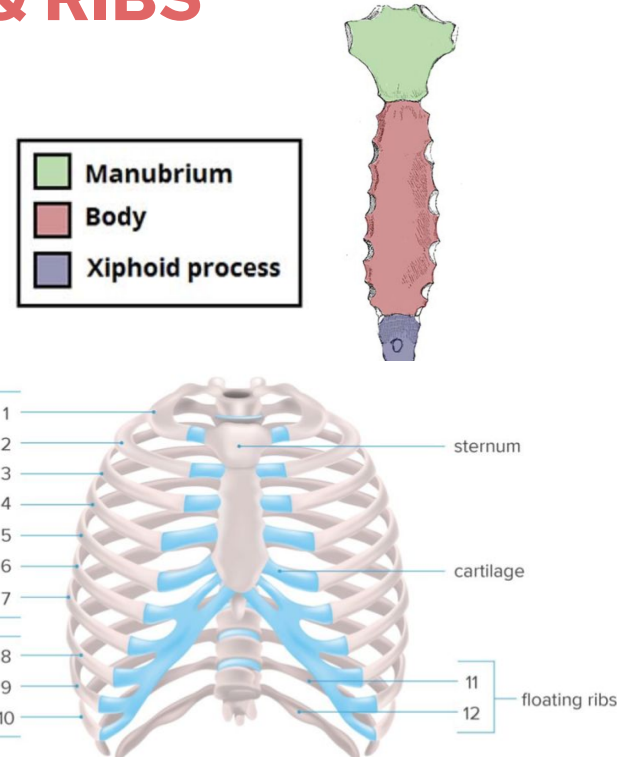
- **Sternum made of 3 parts:**

- Manubrium
- Body
- Xiphoid process

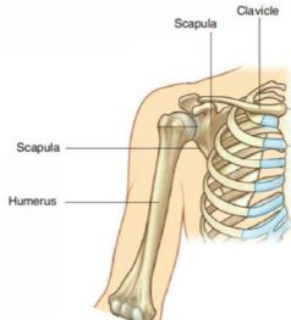
- **Ribs made of 12 pairs:**

- **Upper 7 - true ribs**
because they articulate with the **Sternum** directly.
- **8, 9, 10 - false ribs**
Do not articulate with the ribs and sternum directly,
but are connected by to the 7th rib by **cartilage**.
- **11, 12 - floating ribs**
Only connected by the vertebrae.
- (Note: The false ribs include the floating ribs)

- **All ribs** articulate with **vertebrae** posteriorly.



THE GIRDLES



1. Pectoral girdle formed of:

- Clavicle
- Scapula

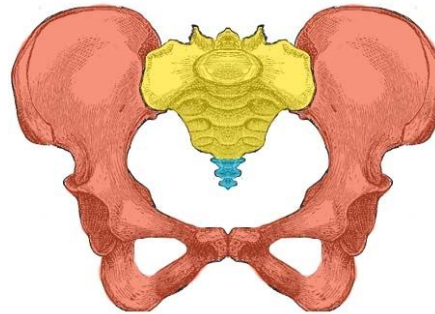
(Two bones on each side)

- Connects **upper limb** with axial skeleton

2. Pelvic girdle formed of:

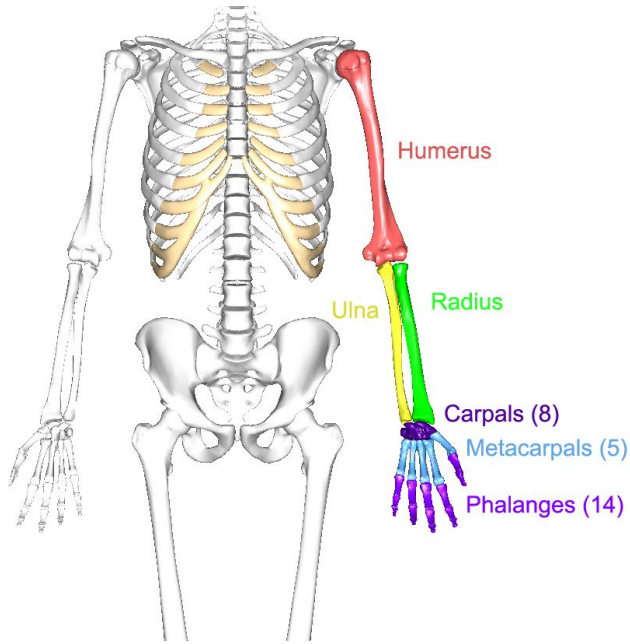
- Hip bone
(one only on **each side**)

- Connects **lower limb** with axial skeleton



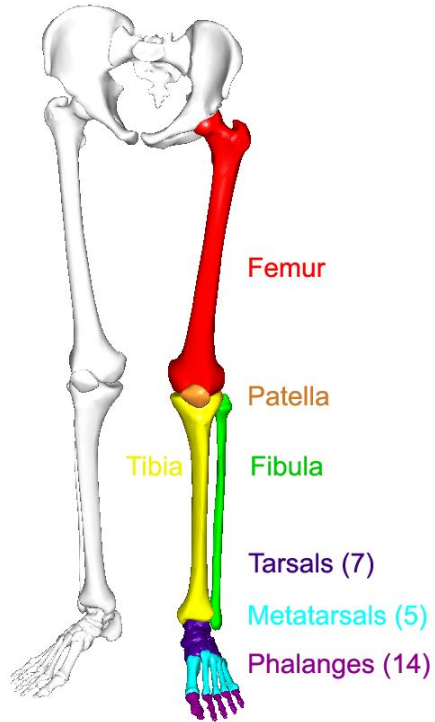
- Hip bones
- Sacrum
- Coccyx

THE UPPER LIMBS

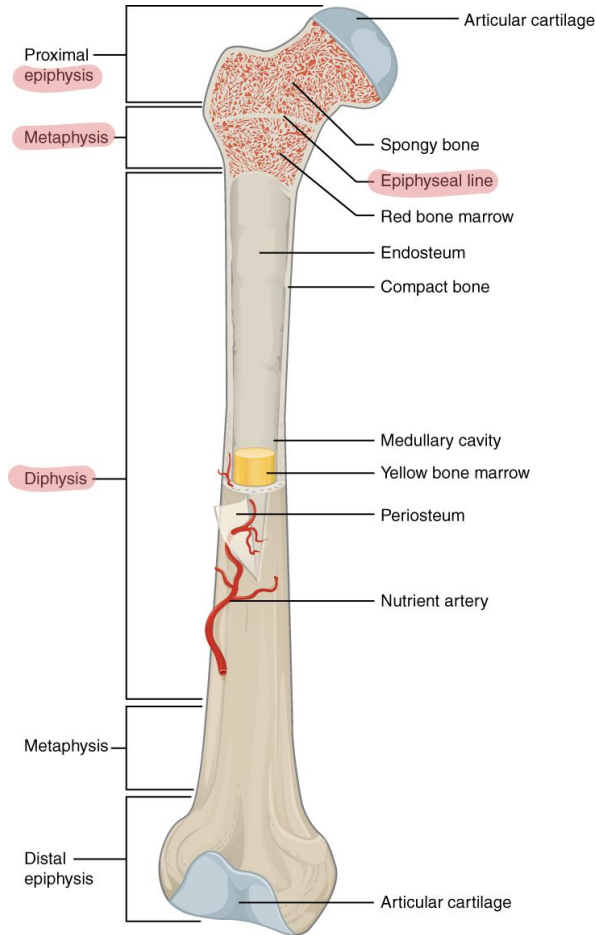


- **Upper limb:**
 - **Bone of the arm:**
 - Humerus
 - **Bones of the forearm:**
 - Radius (**lateral**)
 - Ulna (**medial**)
 - **Bones of the hand:**
 - **8** Carpals (in two rows)
 - **5** Metacarpals
 - **14** Phalanges
 - **2** for thumb
 - **3** for each of medial 4 fingers

THE LOWER LIMBS



- **Lower limb:**
 - **Bone of the thigh:**
 - Femur
 - **Bones of the leg:**
 - Fibula (**lateral**)
 - Tibia (**medial**)
 - Patella (in front of the knee)
 - **Bones of the foot:**
 - **7** Tarsals (in two rows)
 - **5** Metatarsals
 - **14** Phalanges
 - **2** for big toe
 - **3** for each of lateral 4 toes



LONG BONES

- **Long bones are formed of:**
 - **Shaft/diaphysis**
 - Compact bone
 - **Ends/epiphysis**
 - Spongy (cancellous) bone
 - **Metaphysis**
 - Region of contact between epiphysis & diaphysis
 - Contains the **epiphyseal plate** of cartilage that is responsible for **linear bone growth**

MCQs:

1- Study of human body with naked eye is:

A- Microscopic anatomy

B- Surface anatomy

C- Gross Anatomy

D- Applied anatomy

2-A special movement of the upper limb where the radius crosses the ulna is:

A- Opposition

B- Pronation

C- Eversion

D- Supination

3- Name the medial bone of the forearm:

A- Ulna

B- Femur

C- Radius

D- Humerus

4- Which of the following pair is correct?

A- Cervical : 5

B- Lumbar : 4

C- Coccyx: 5

D- Sacrum : 5

5- Which of the following is not a part of the sternum?

A- Body

B- Cartilage

C- Manubrium

D- Xiphoid process

Answers

1 C

2 B

3 A

4 D

5 B

Team members:

عبدالإله آل رشود	عبدالعزیز عناب	فاطمة البن موسى	غادة الحربي
راكان العبيد	عبدالرحمن الهميلي	سحر الحكمي	ريما الرشيدى
يحيى الغامدي	محمد العمري	ندى السيف	شيماء القعود
بسام الخرجي	حمد الجبير	لطيفة الخضيرى	مجدلى الخضير
سعد الغدير	نواف آل الشيخ	غادة العريفى	رنا المزروع



Team leaders:

فواز الحقيلى رزان العبيد

Sub leader:

ساره الحميضى



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