LOWER LIMB ANATOMY Introduction & Structural Overview

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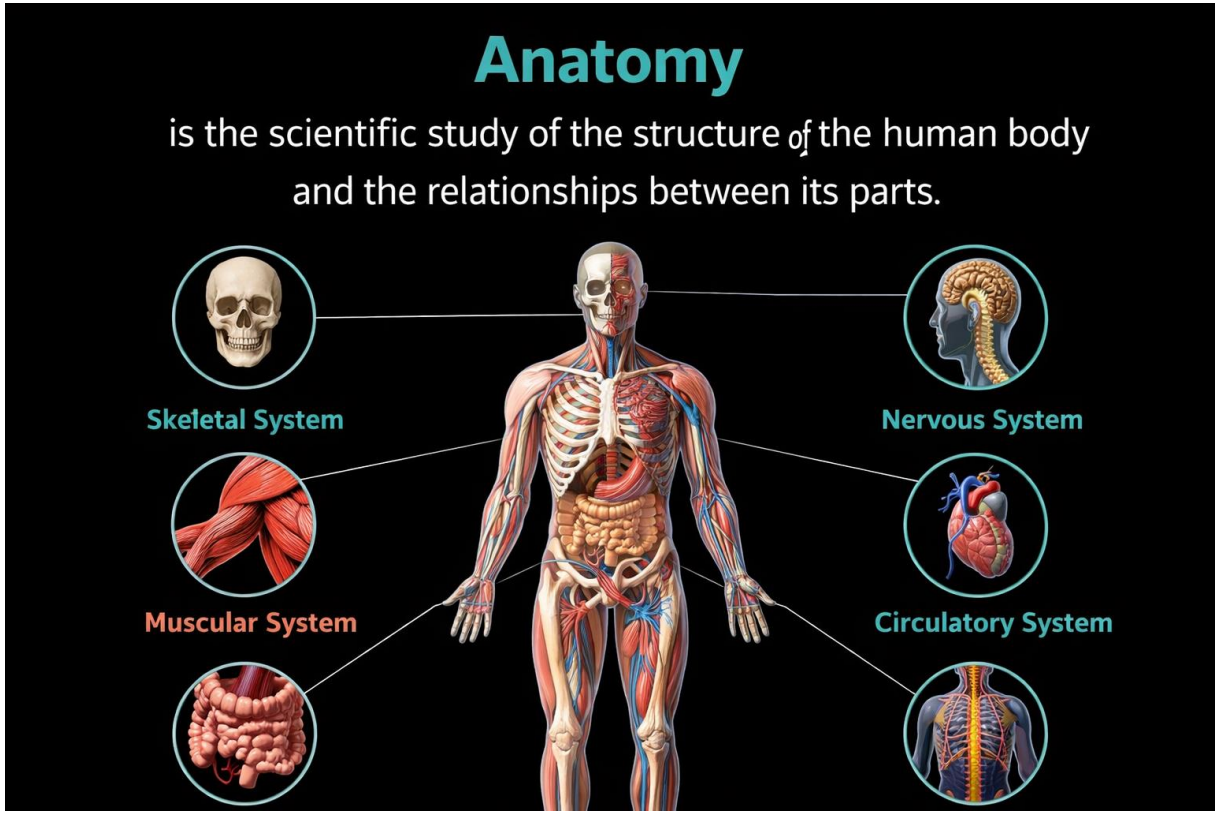
what is Anatomy?

Anatomy is the scientific study of the **structure of the human body and the relationships between its parts.**

Main Divisions

- **Gross Anatomy** – structures visible to the naked eye
- **Microscopic Anatomy (Histology)** – tissues and cells
- **Developmental Anatomy (Embryology)** – structural changes from conception to birth

💡 *Clinical anatomy applies anatomical knowledge to medical practice.*



What is the Importance of Anatomical Terminology

- Provides a **universal language** for healthcare professionals
- Prevents **clinical miscommunication**
- Allows precise **description of structures and procedures**

 All anatomical descriptions assume the **standard anatomical position**

Standard Anatomical Position

- Body standing upright
- Head and eyes facing forward
- Arms at the sides
- Palms facing forward
- Lower limbs together
- Feet directed anteriorly

📌 All anatomical directions are based on this position.

Anatomical Planes

Sagittal Plane

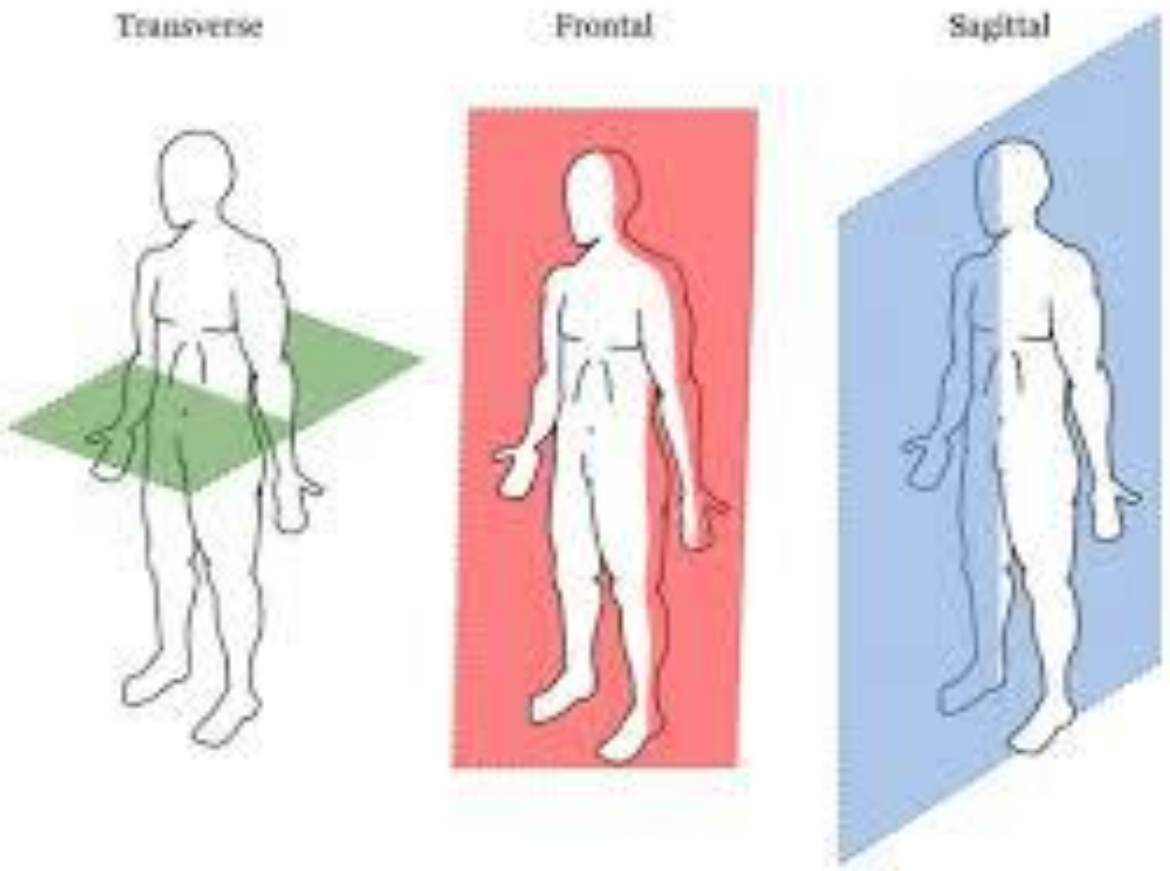
Divides the body into **right and left**

Frontal (Coronal) Plane

Divides the body into **anterior and posterior**

Transverse (Axial) Plane

Divides the body into **superior and inferior**

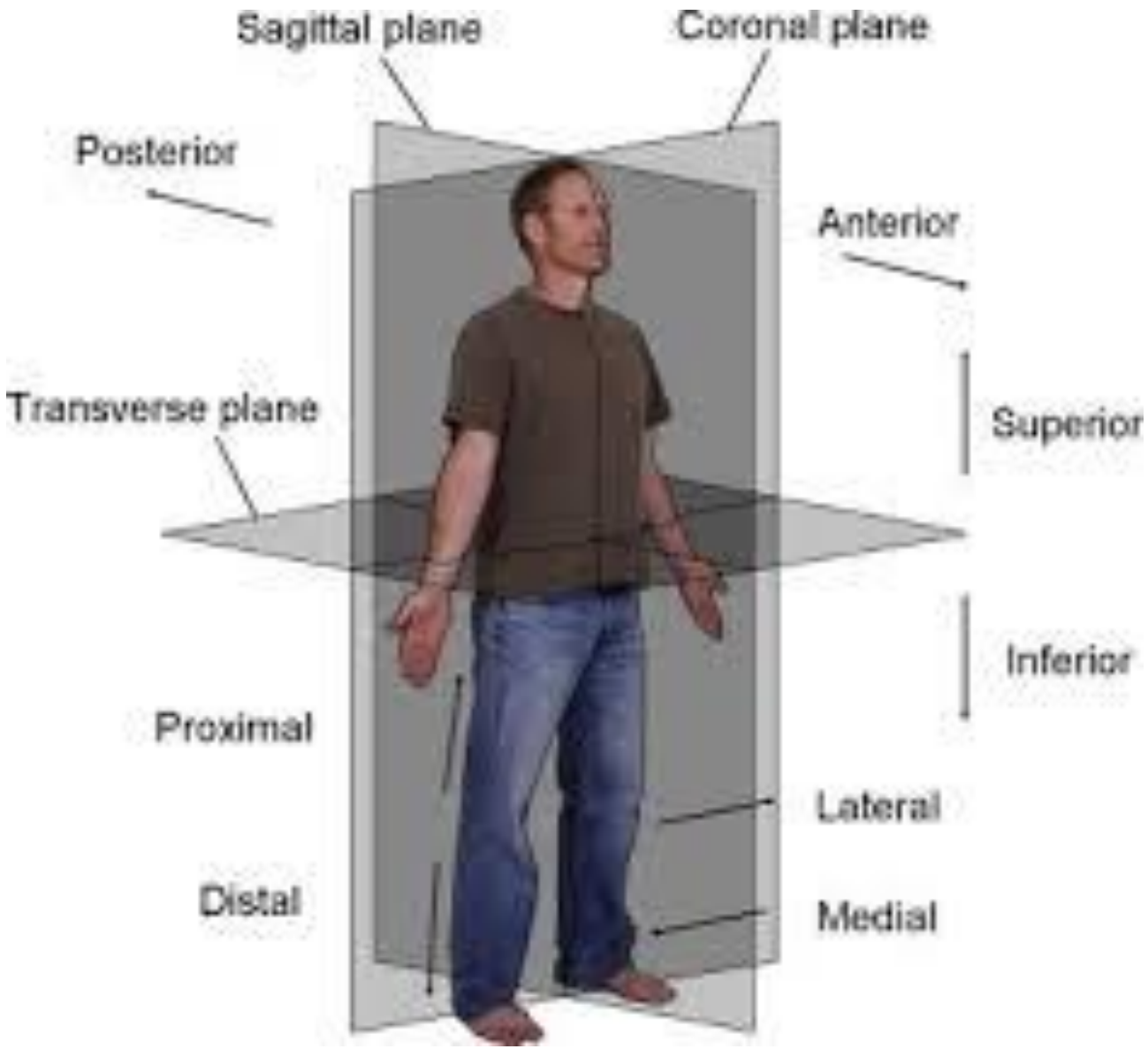


Anatomical Directional Terms

Common terms used when describing limbs:

- **Superior** – toward the head
- **Inferior** – toward the feet
- **Anterior** – front of the body
- **Posterior** – back of the body
- **Medial** – toward the midline
- **Lateral** – away from the midline
- **Proximal** – closer to trunk
- **Distal** – farther from trunk

📌 These terms are essential when studying limb structures.



Anatomic TERMS:

- ❖ In four legged animals the UPPER (BACK) surface is called DORSAL and the lower (belly) surface ventral.
- ❖ The terms *anterior*, *cranial*, *cephalic*, and *rostral* refer to the head end of the body,
- ❖ *posterior* and *caudal* to the tail end.
- ❖ In humans,
- ✓ DORSAL becomes equivalent to POSTERIOR
- ✓ VENTRAL is the same as ANTERIOR
- ✓ CRANIAL is often called SUPERIOR
- ✓ CAUDAL is for INFERIOR.

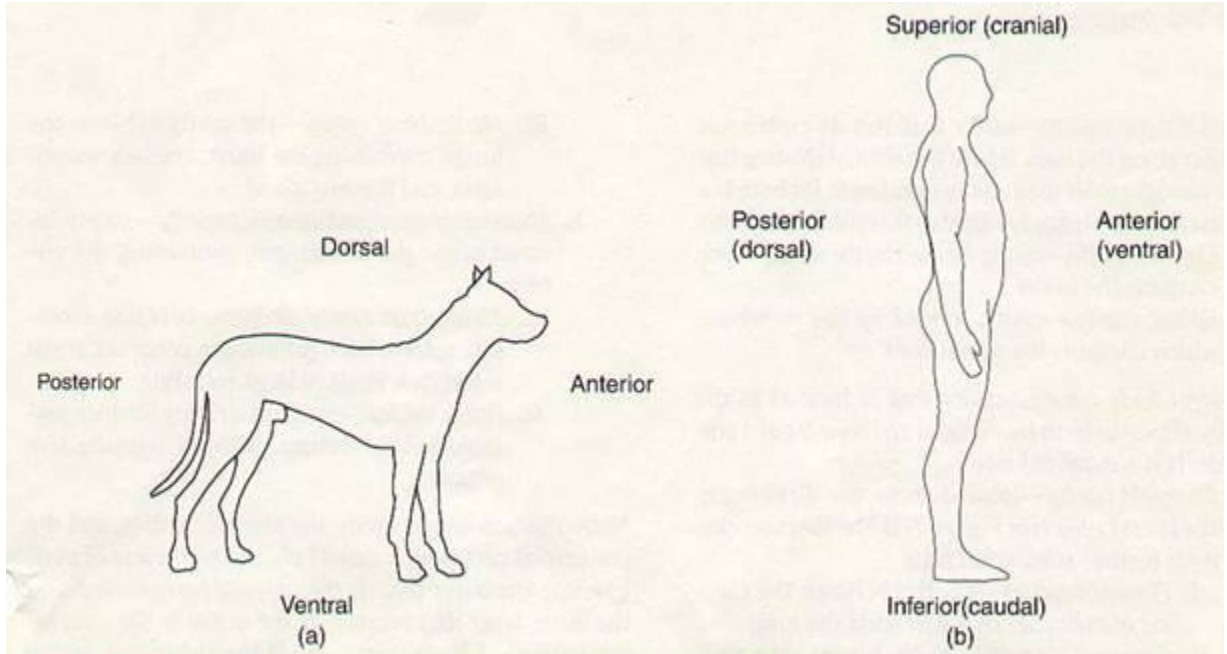
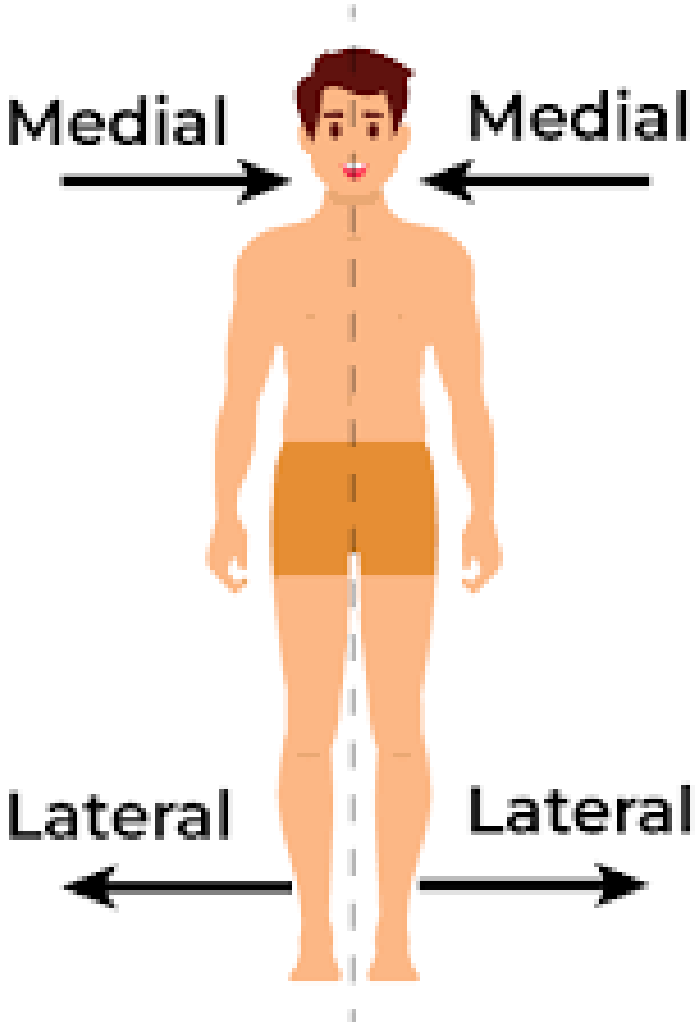
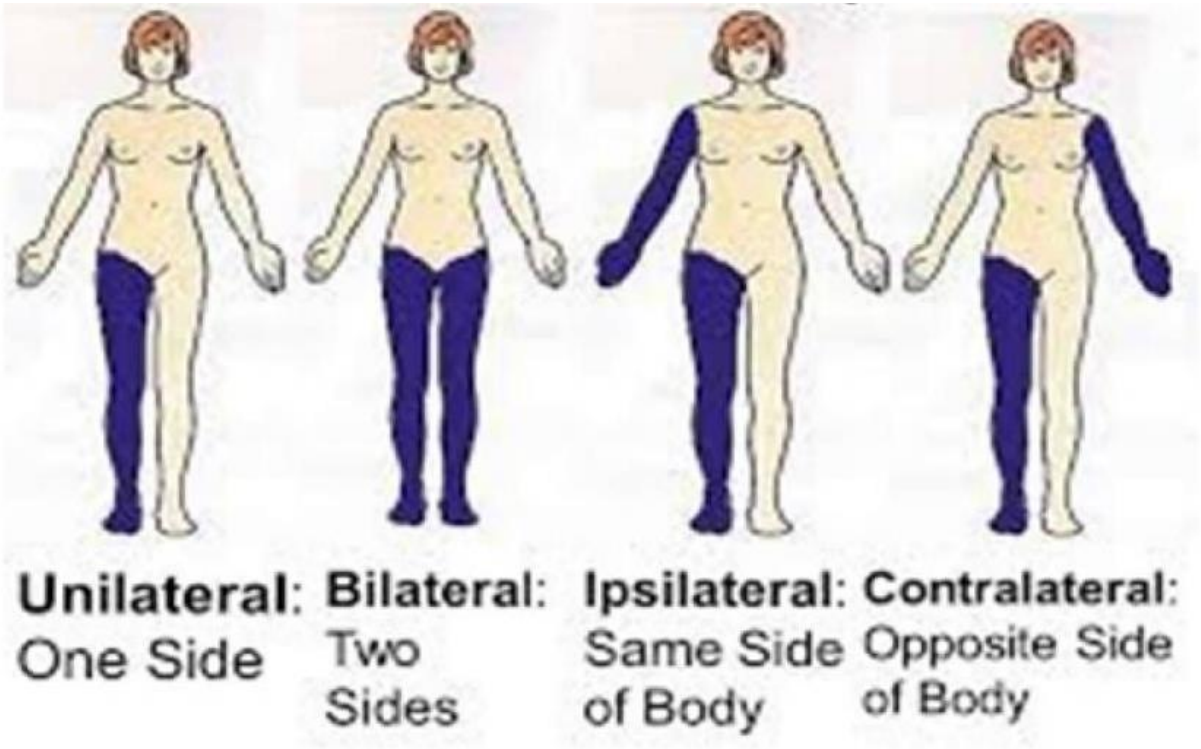


Figure 7-2 Lateral view of (a) four-legged animal and (b) two-legged form. Please note how the terms for top, bottom, back, and front are used.

- ✓Objects near the middle plane of the body are medial and those farther away are lateral.
- ✓***Proximal*** refers to structures **nearest** the central bulk of a structure and ***distal*** to ones **away** from it.



- ✓In referring to another structure, if it is located on the **same side of the body,** it is known as **ipsilateral;** if it is on the **opposite side**, it is contralateral.



Overview of the Skeletal System

The skeleton is divided into:

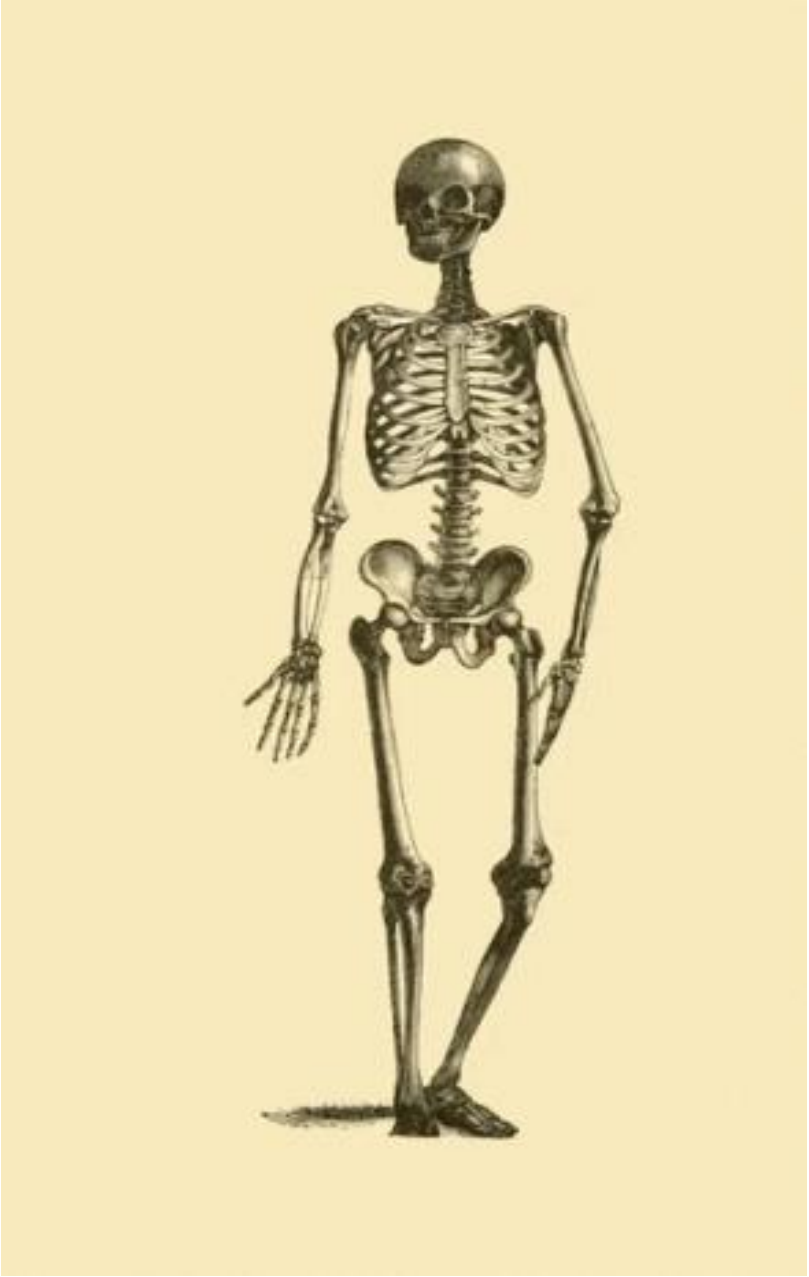
Axial Skeleton

- Skull
- Vertebral column
- Thoracic cage

Appendicular Skeleton

- Upper limbs
- Lower limbs
- Pectoral girdle
- Pelvic girdle

📌 Limbs belong to the **appendicular skeleton**.



Limb Organization

Both upper and lower limbs share a **common structural plan**.

Limb Segments

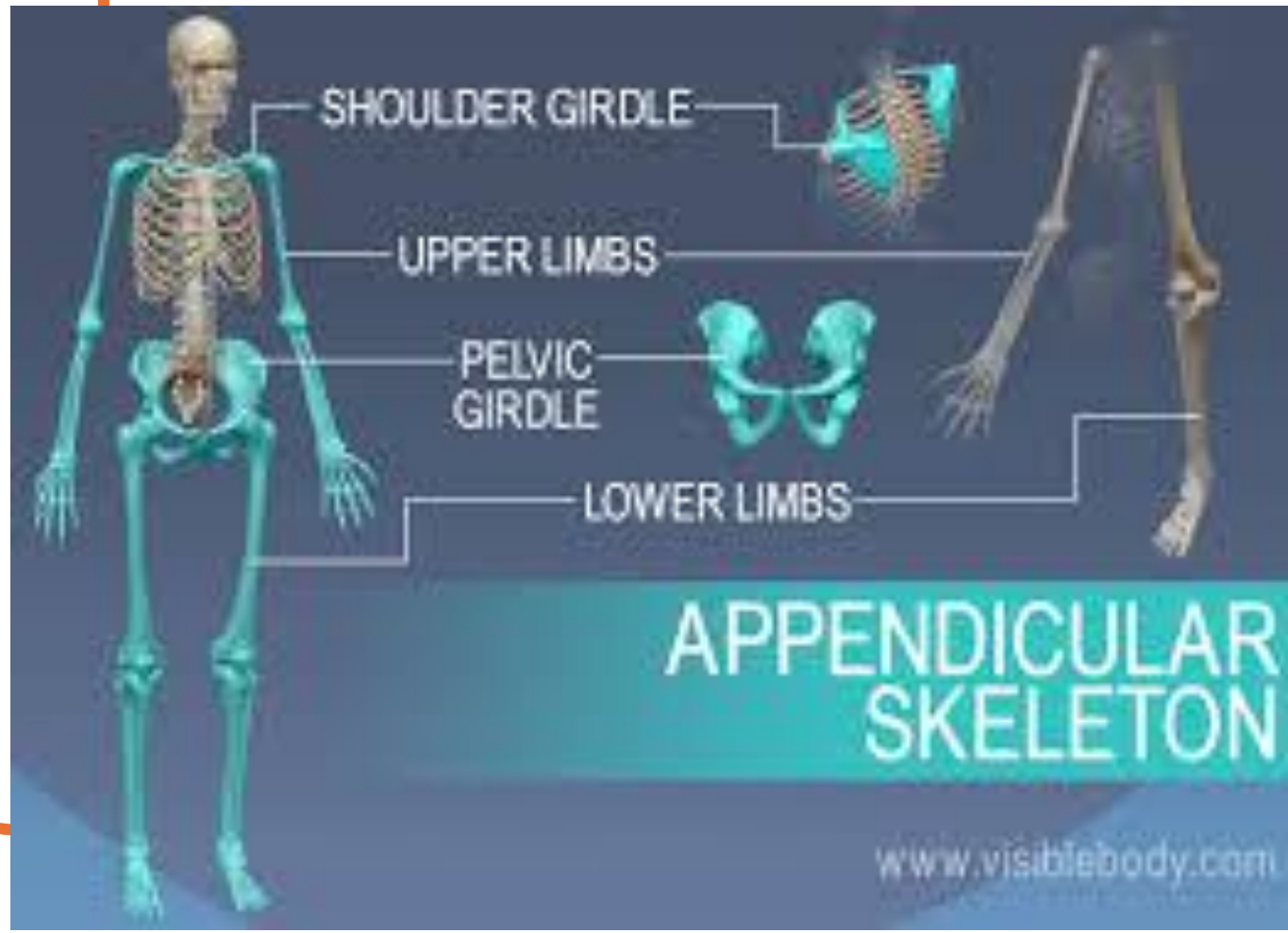
1.Girdle

2.Proximal segment

3.Intermediate segment

4.Distal segment

This structural pattern reflects **evolutionary and developmental similarity**



What is the limbs

Is a multi-jointed lever

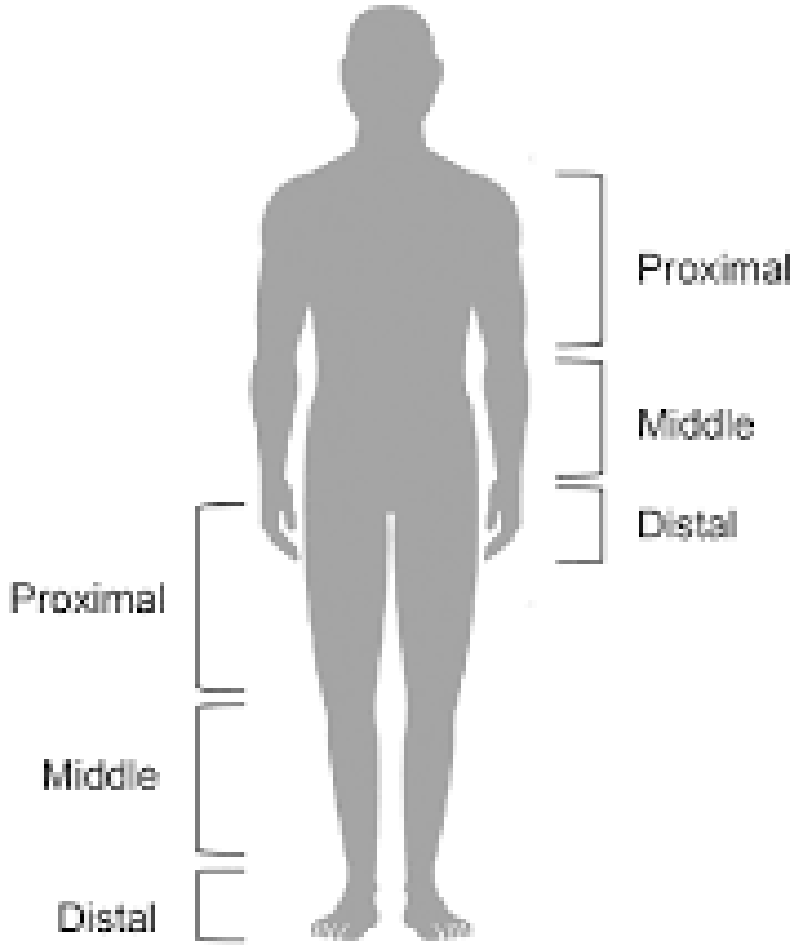
Upper Limb vs Lower Limb

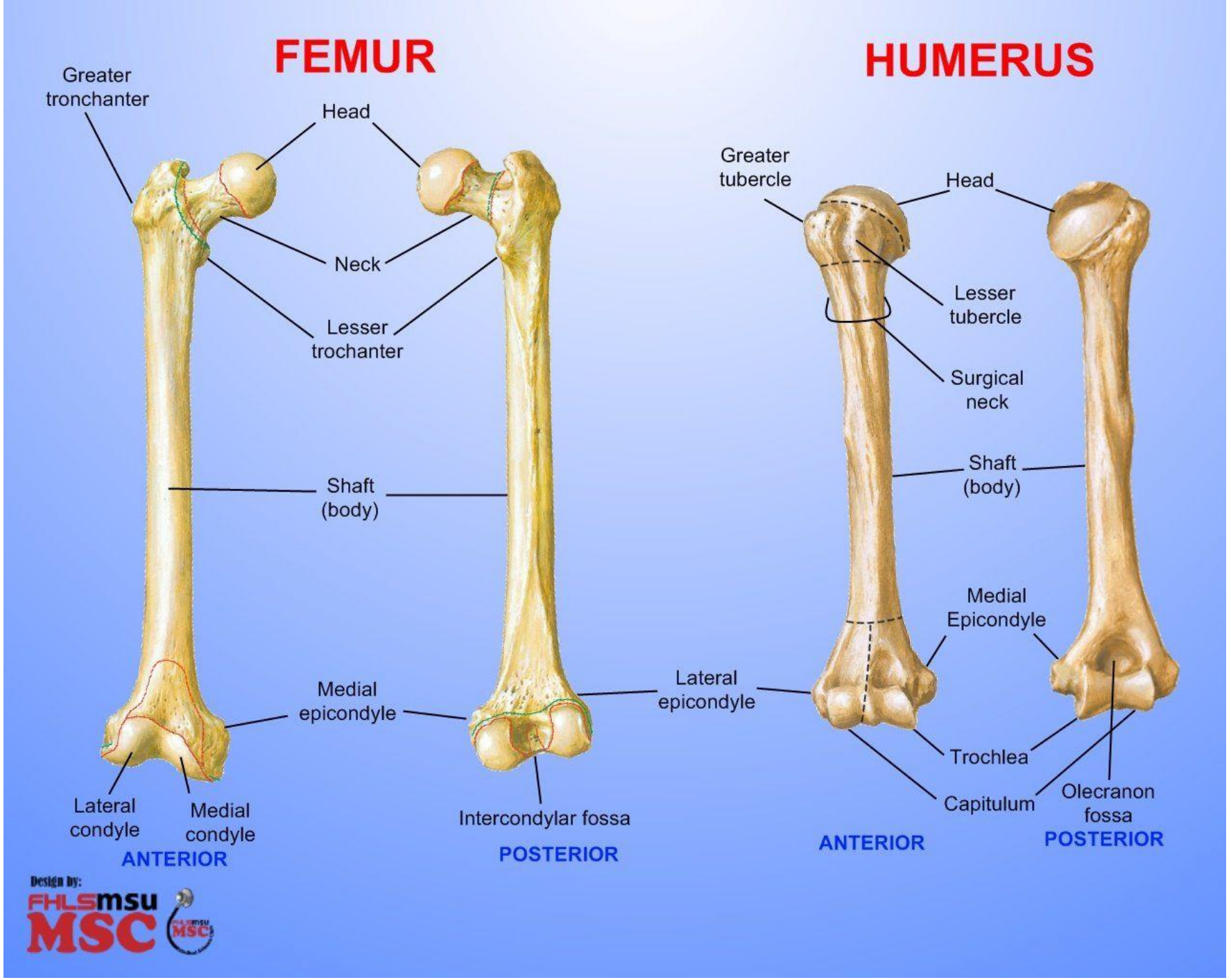
Feature	Upper Limb	Lower Limb
Primary Function	Mobility & manipulation	Weight bearing & locomotion
Mobility	Highly mobile	More stable
Girdle	Pectoral girdle	Pelvic girdle
Distal Specialization	Hand for precision	Foot for support

📌 Lower limb sacrifices mobility for **stability and power.**

Both limbs follow the same developmental plan.

Segment	Upper Limb	Lower Limb
Girdle	Pectoral girdle	Pelvic girdle
Proximal bone	Humerus	Femur
Intermediate bones	Radius & Ulna	Tibia & Fibula
Distal part	Hand	Foot




FEMUR
Greater tronchanter
Head
Neck
Lesser trochanter
Shaft (body)
Medial epicondyle
Lateral condyle
Medial condyle
ANTERIOR
Intercondylar fossa
POSTERIOR
HUMERUS
Greater tubercle
Head
Lesser tubercle
Surgical neck
Shaft (body)
Medial Epicondyle
Lateral epicondyle
Trochlea
Capitulum
ANTERIOR
Olecranon fossa
POSTERIOR
Design by:
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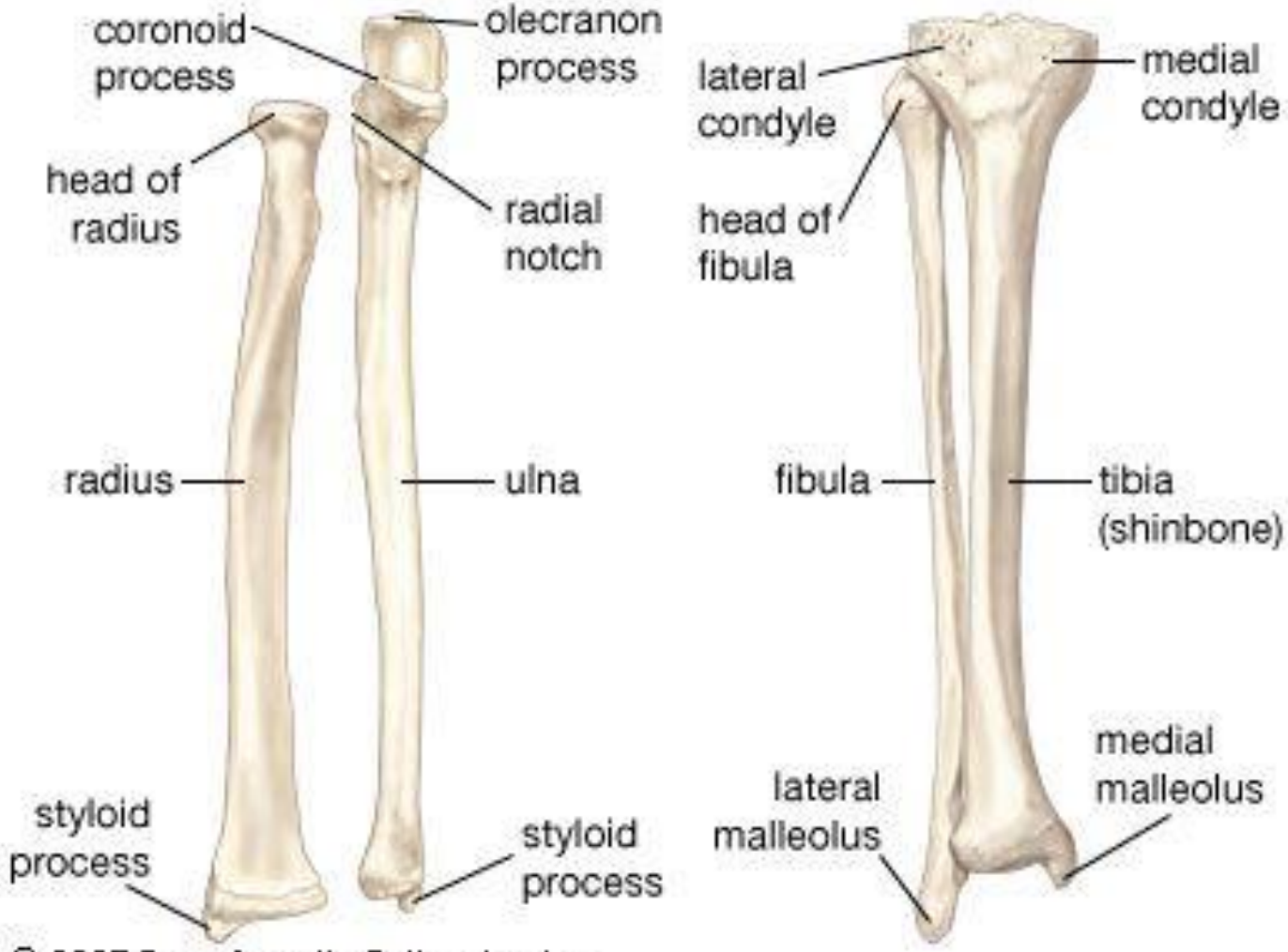
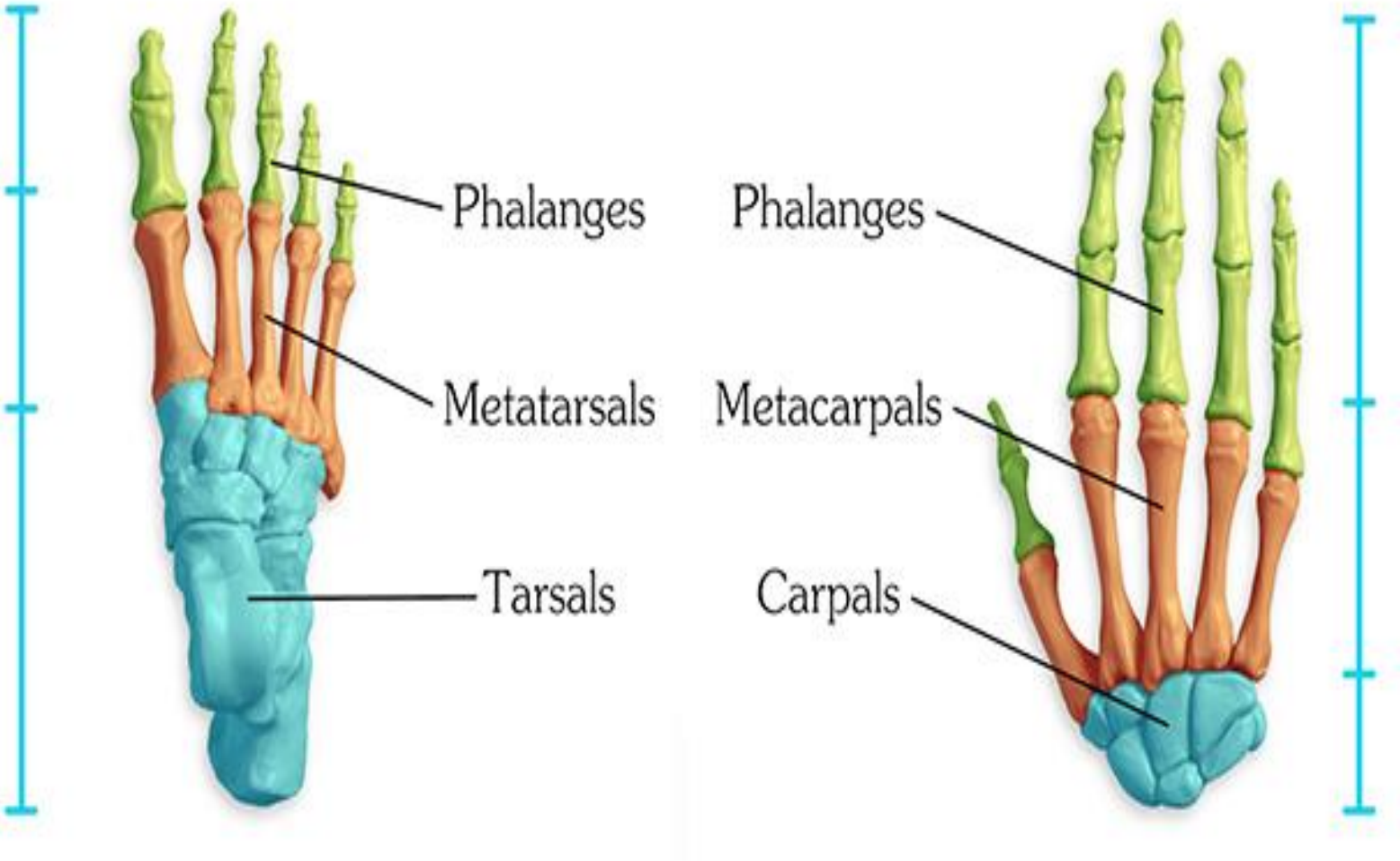


Metatarsal vs Metacarpal




femur
(thigh bone)
patella
(knee cap)
patellar
tendon
fibula
tibia
(shin bone)