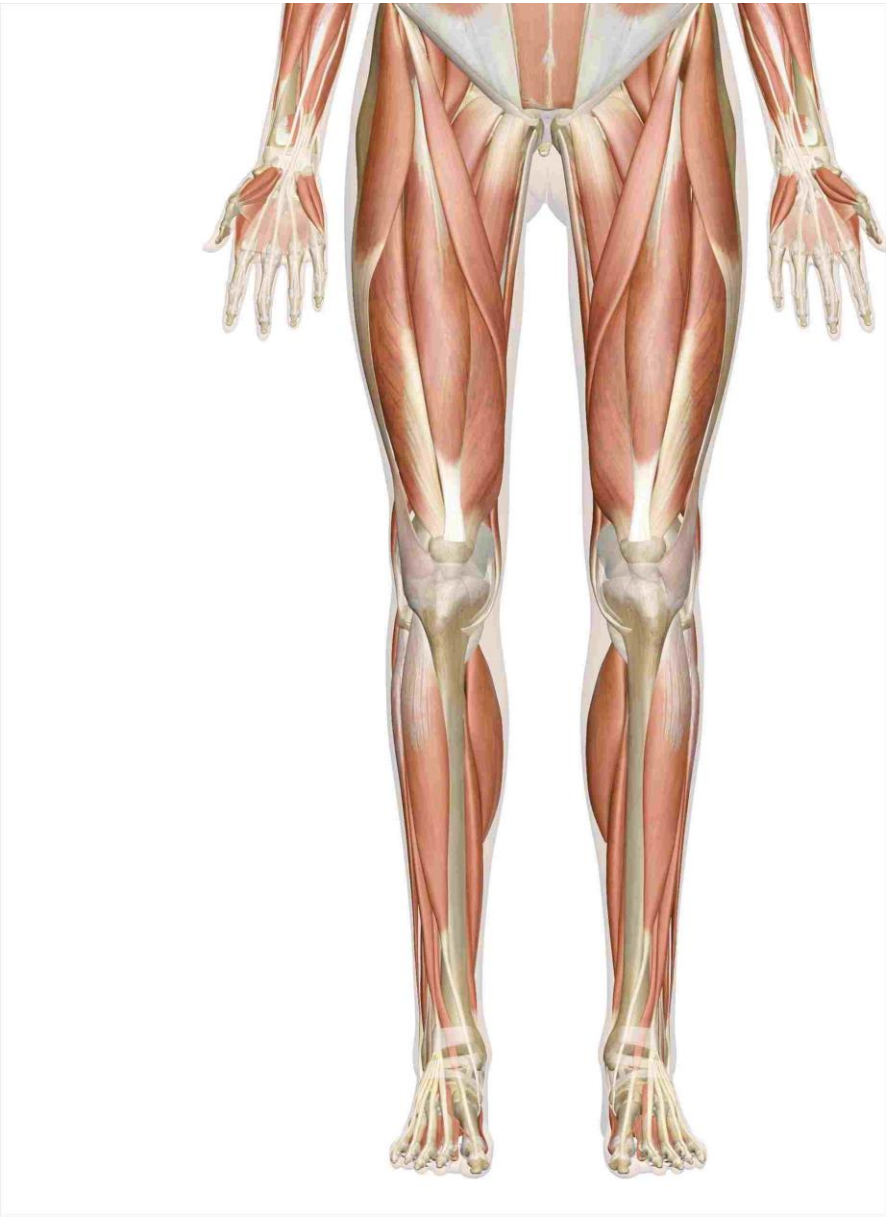
Lower Limb Bones & Joints

Dr Amal Albtoosh



Functions of the Lower Limb

The primary function of the lower limb is:

- ❖ To support the weight of the body
- ❖ To provide a stable foundation

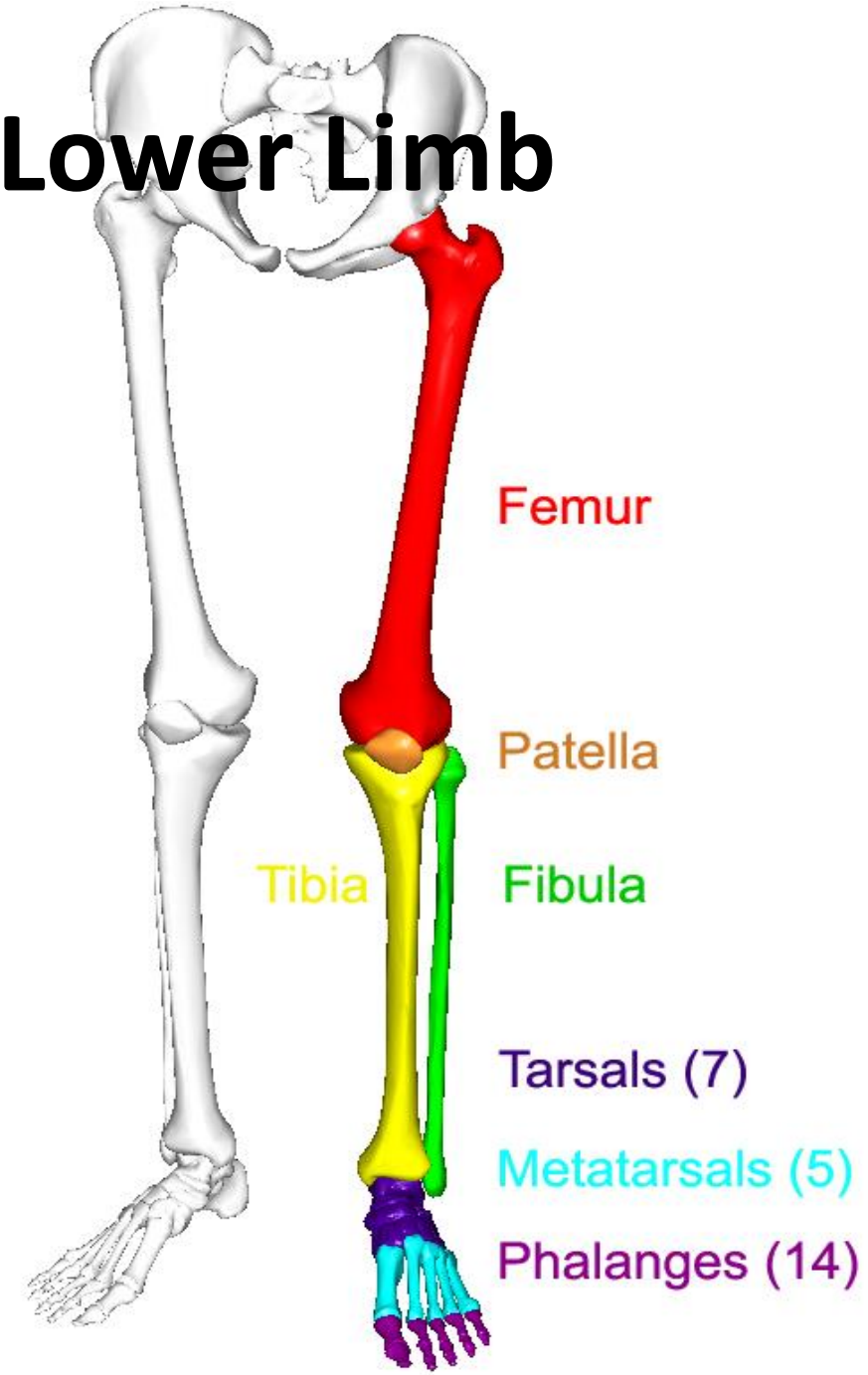
when standing, walking, or running.

Each lower limb may be divided into:

- The Gluteal Region,
- The Thigh,
- The Knee,
- The Leg,
- The Ankle,
- The Foot.

Bones of the Lower Limb

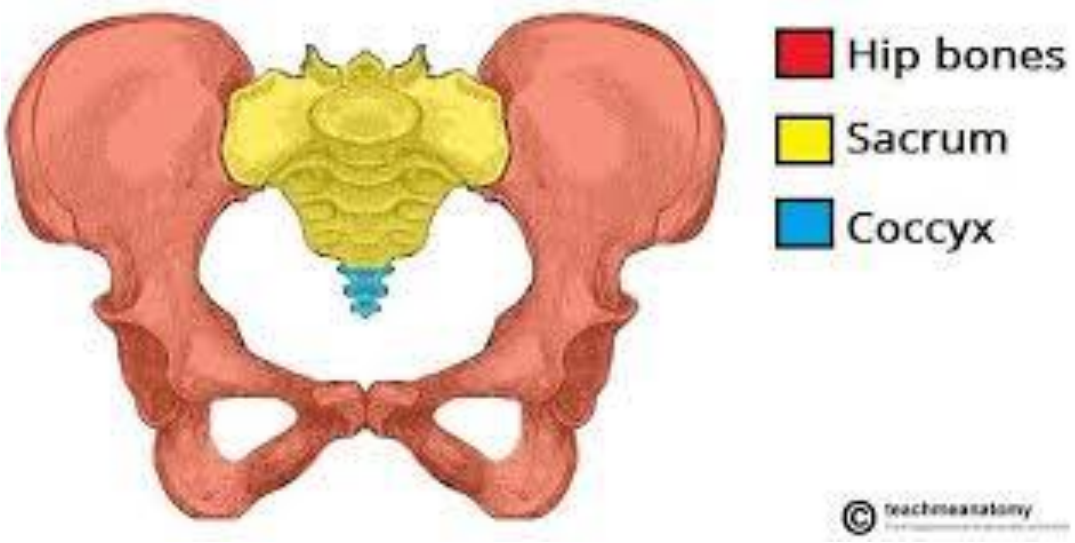
- Components:
  - Thigh
    - Femur
    - Patella
  - Leg
    - Tibia (medial)
    - Fibula (lateral)
  - Foot
    - Tarsals (7)
    - Metatarsals (5)
    - Phalanges (14)



Bones of the Pelvic Girdle

The pelvic girdle consists of four bones:

- ❑ THE TWO HIP BONES
- ❑ THE SACRUM
- ❑ THE COCCYX

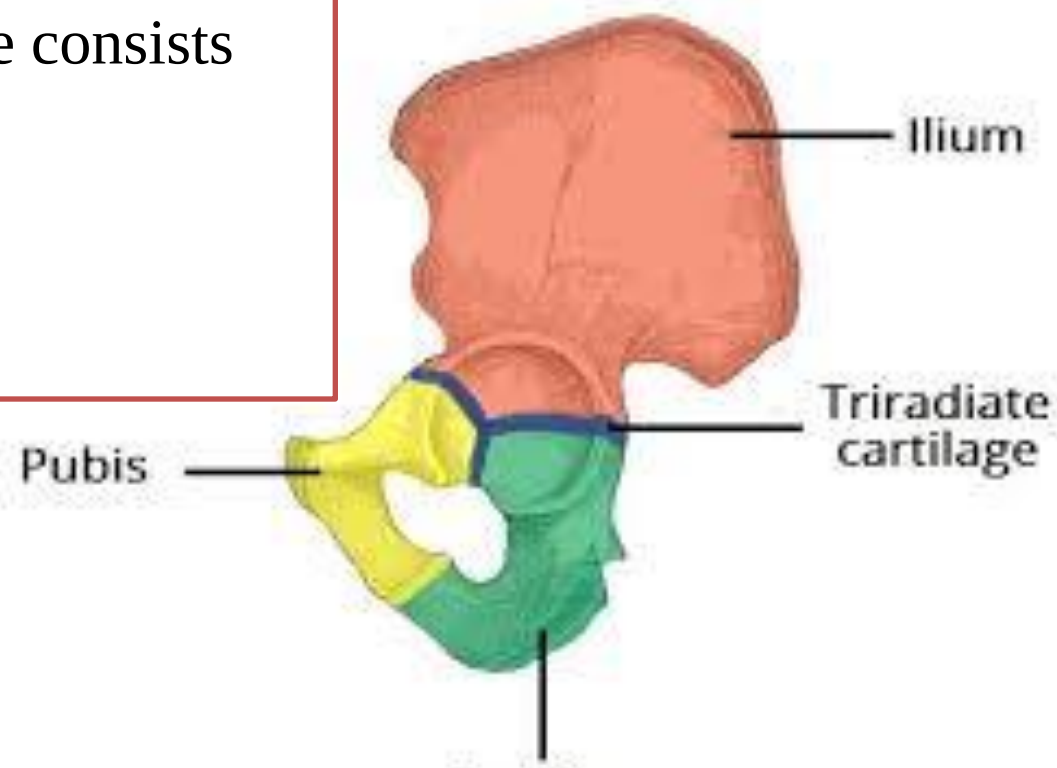


Function: The pelvic girdle provides a strong connection between the trunk and the lower limbs.

HIP BONE

In children, each hip bone consists of:

- ❖ THE ILIUM
- ❖THE ISCHIUM
- ❖ THE PUBIS



At puberty, these three bones fuse together to form one large, irregular bone.

Bones of the Thigh

FEMUR

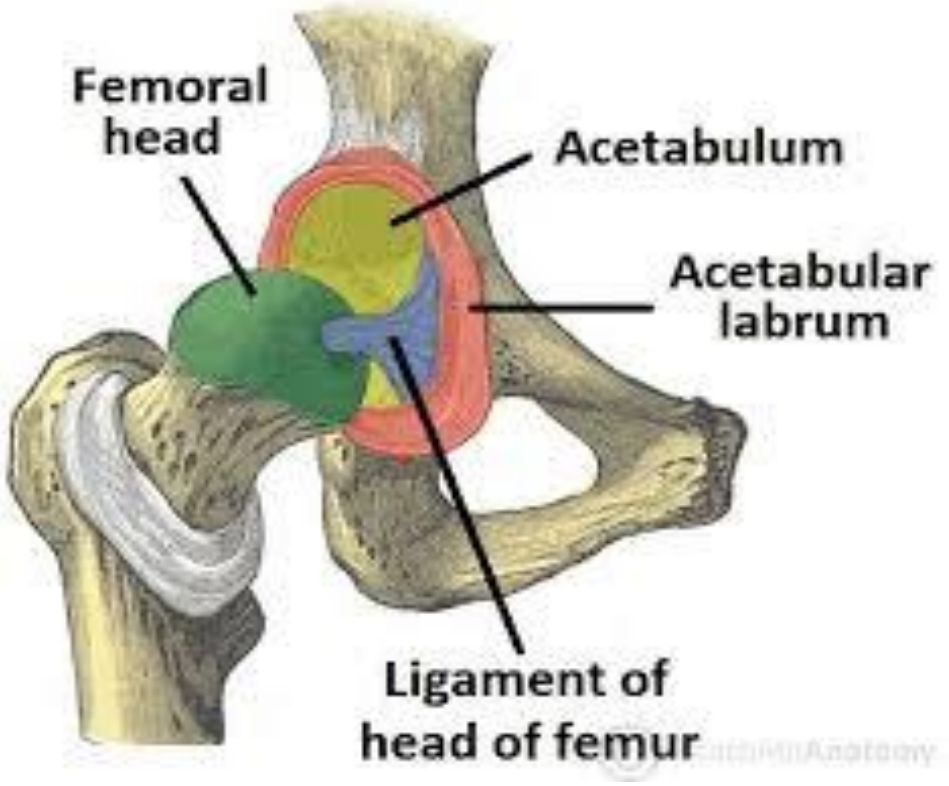
❖ The **HEAD's features**

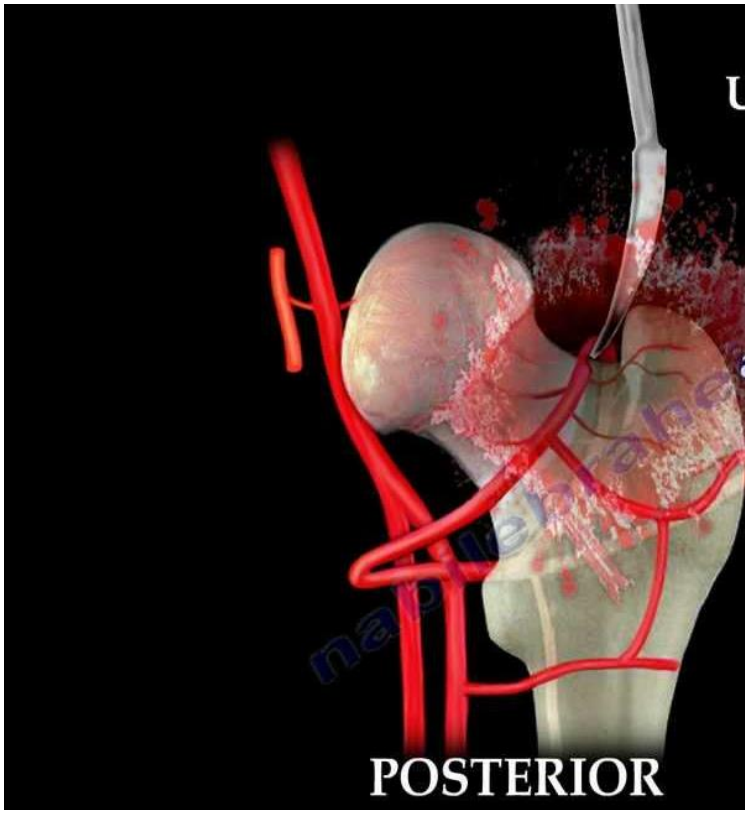
• the head of the femur is hemispheric in shape and fits into the acetabulum to form the hip joint.

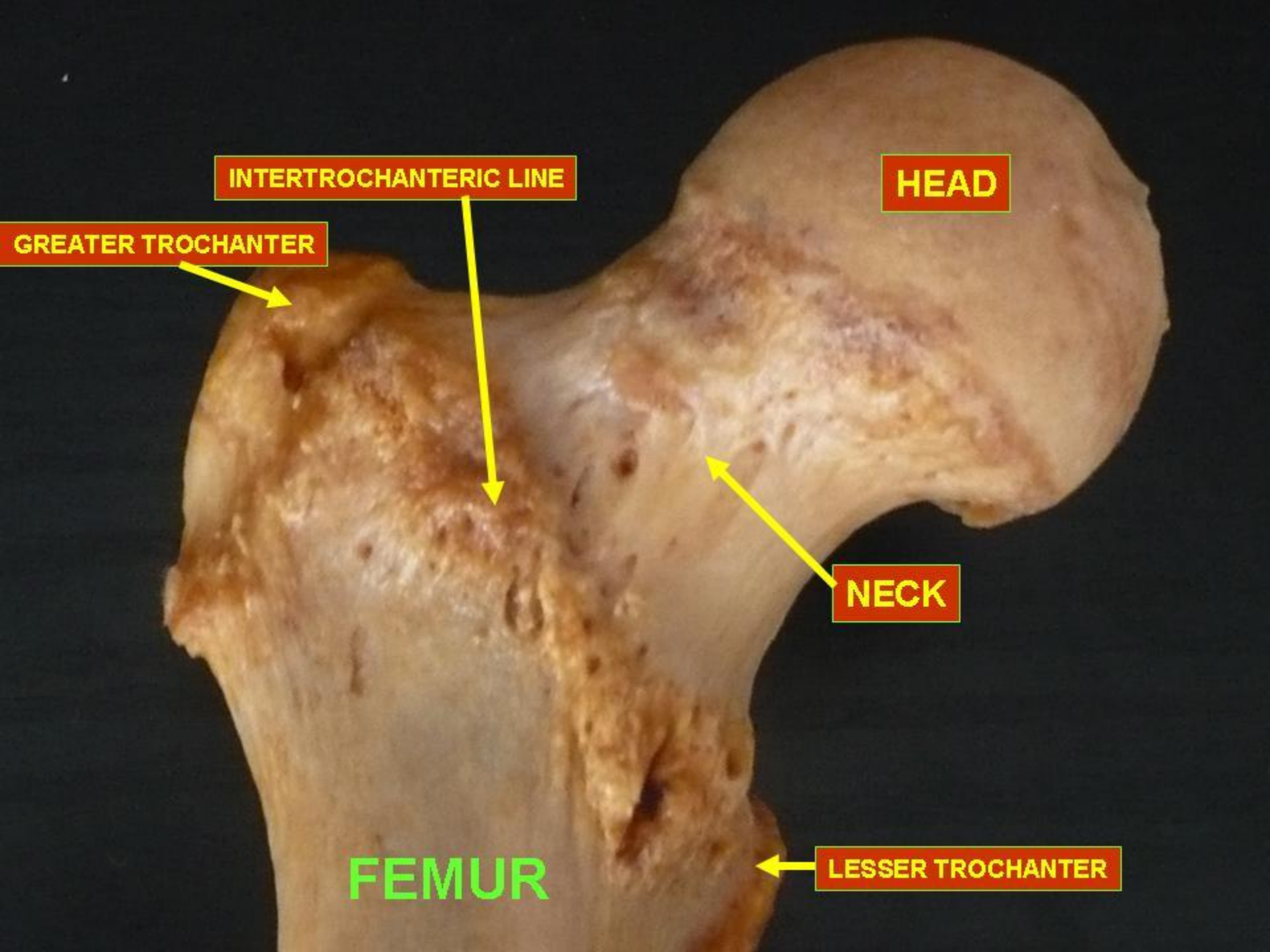
• The **fovea capitis** is a small depression in the center of the head

➢Function:1- for the attachment of the ligament of the head.

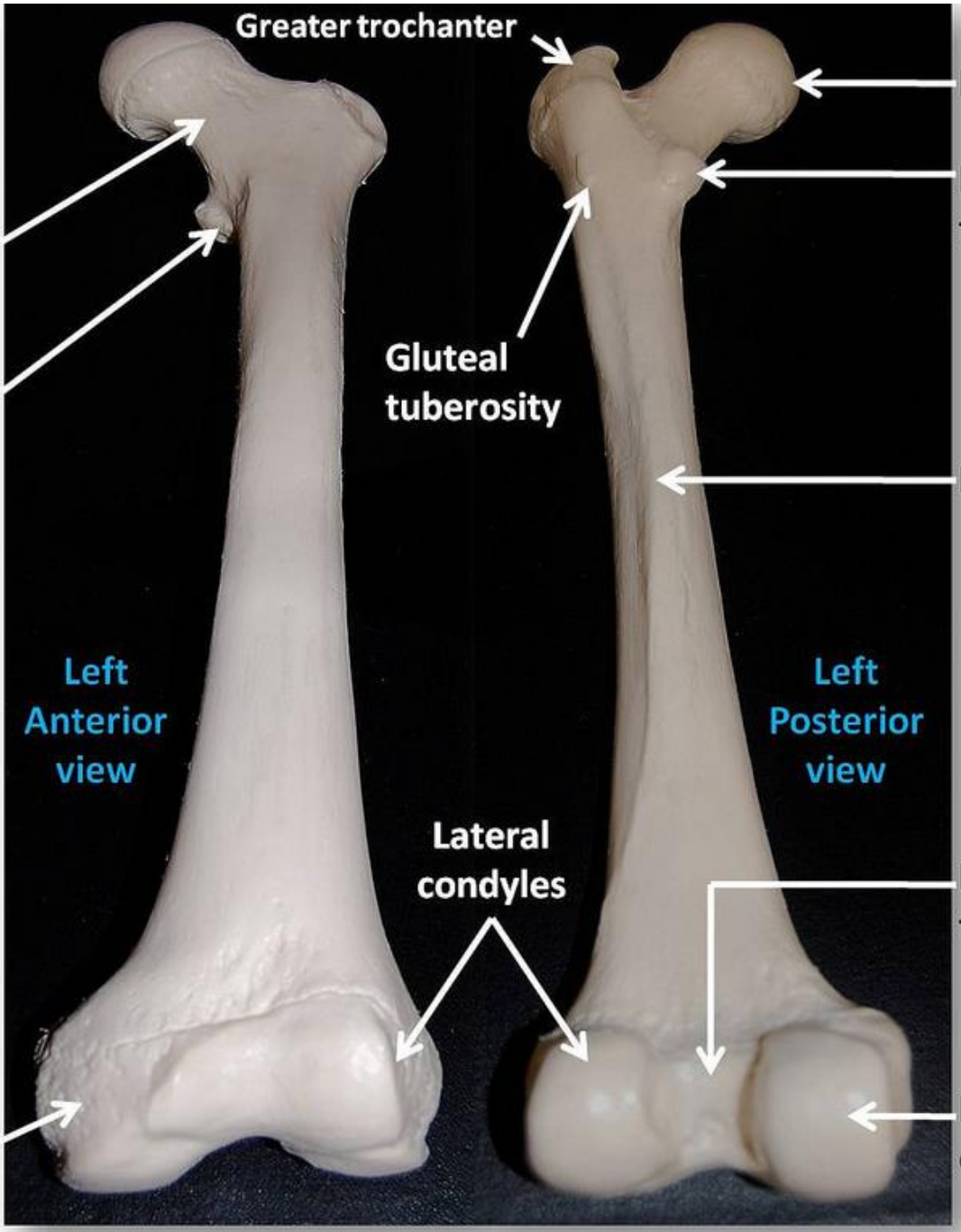
➢2- Part of the blood supply to the head of the femur

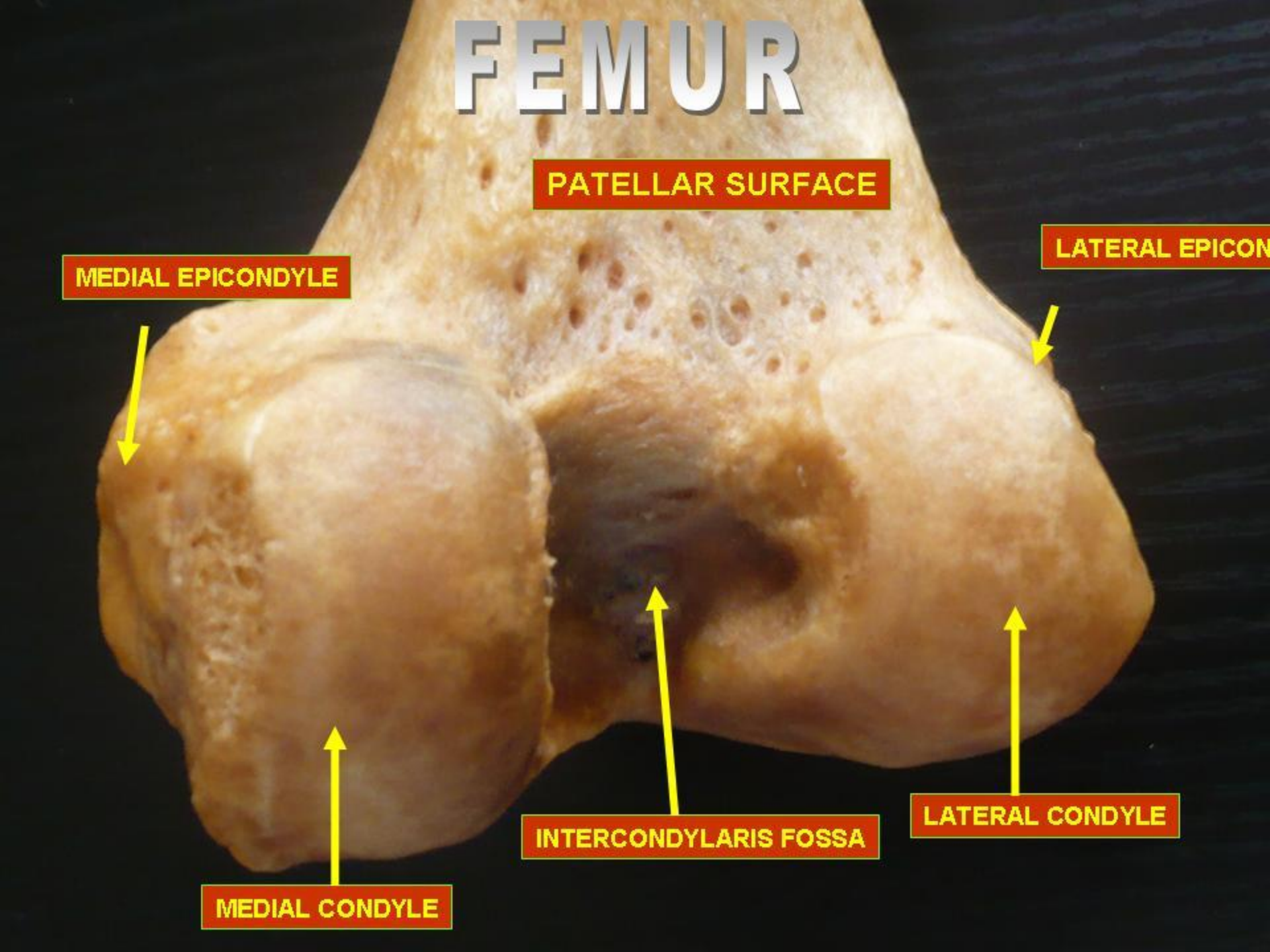

Femoral head
Acetabulum
Acetabular labrum
Ligament of head of femur

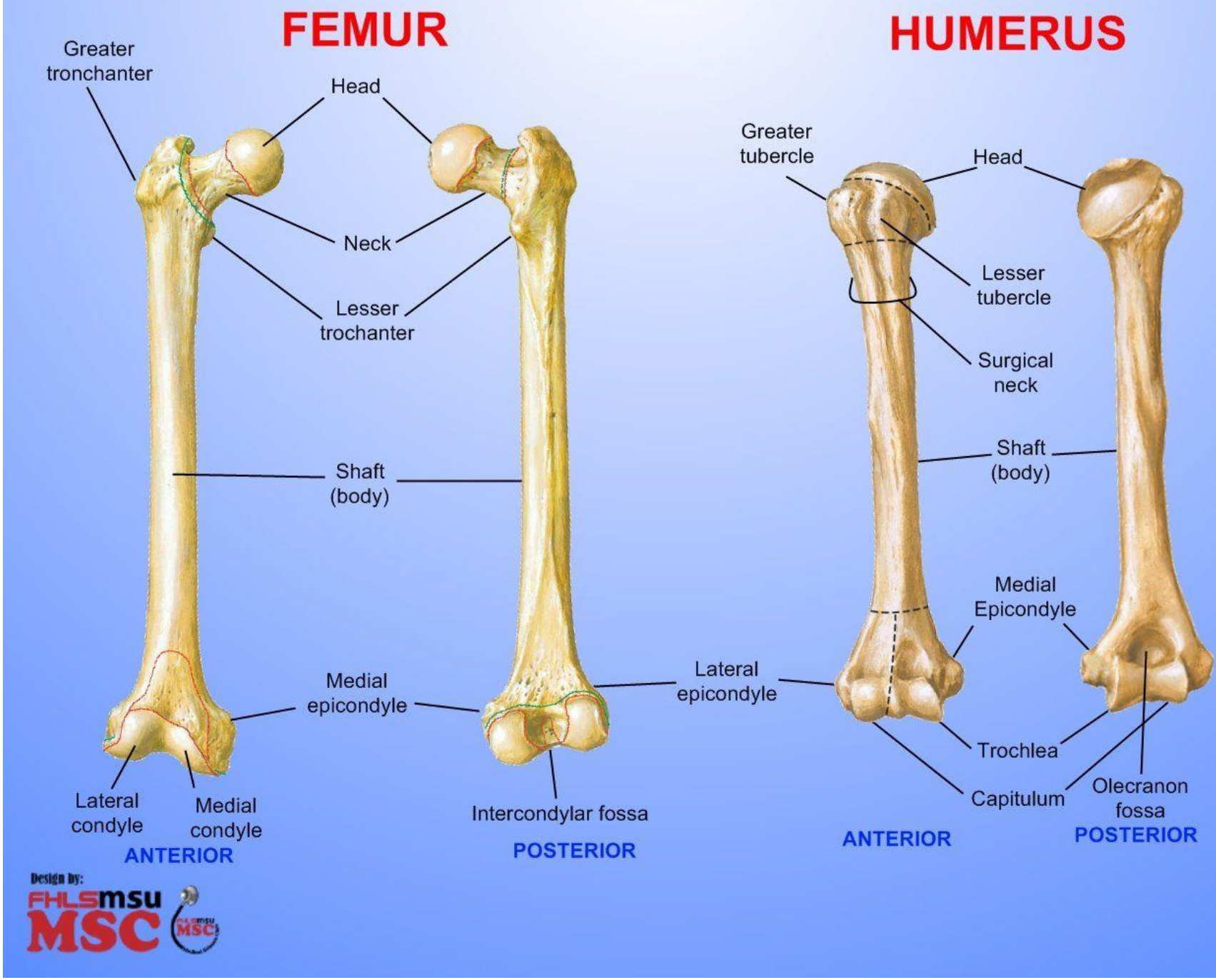

POSTERIOR


INTERTROCHANTERIC LINE
HEAD
GREATER TROCHANTER
NECK
FEMUR
LESSER TROCHANTER

Femur.


Greater trochanter
Head
Neck
Lesser trochanter
Lesser trochanter
Gluteal tuberosity
Linea aspera
Left Anterior view
Left Posterior view
Lateral condyles
Intercondyla fossa
Medial condyle
Medial condyle


FEMUR
PATELLAR SURFACE
MEDIAL EPICONDYLE
LATERAL EPICON
MEDIAL CONDYLE
INTERCONDYLARIS FOSSA
LATERAL CONDYLE



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PATELLA

❖The patella is the largest sesamoid bone
❖it lies within the **tendon of the quadriceps femoris** muscle in front of the knee joint.
❖ It is TRIANGULAR.
❖ Its apex lies inferiorly and is connected to the tuberosity of the tibia by the **ligamentum patellae.**
❖The posterior surface articulates with the condyles of the femur.

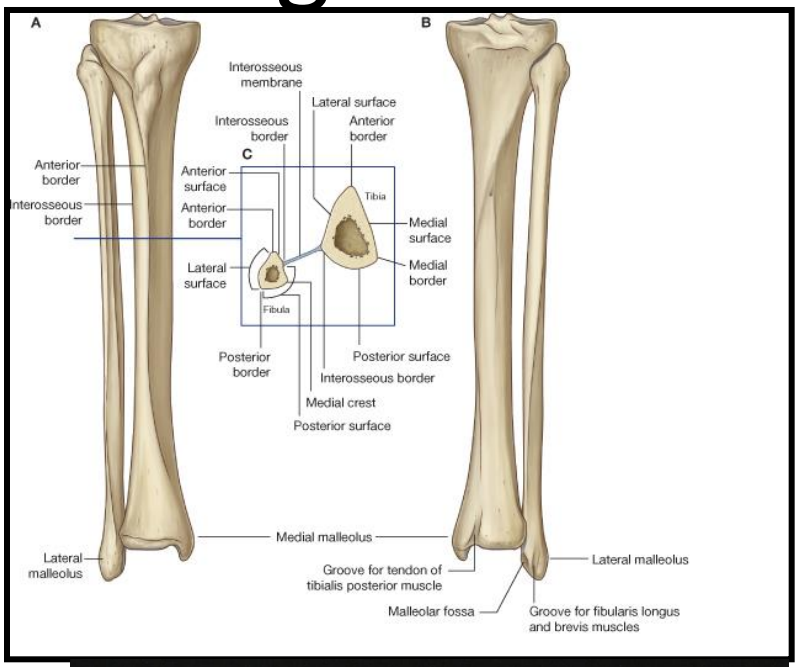
Bones of the Leg

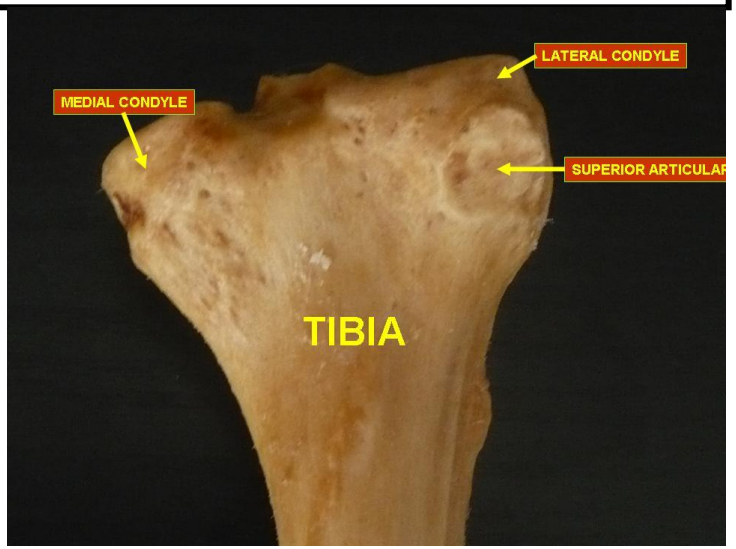
TIBIA

❖The tibia is the large, weight-bearing, medial bone of the leg.

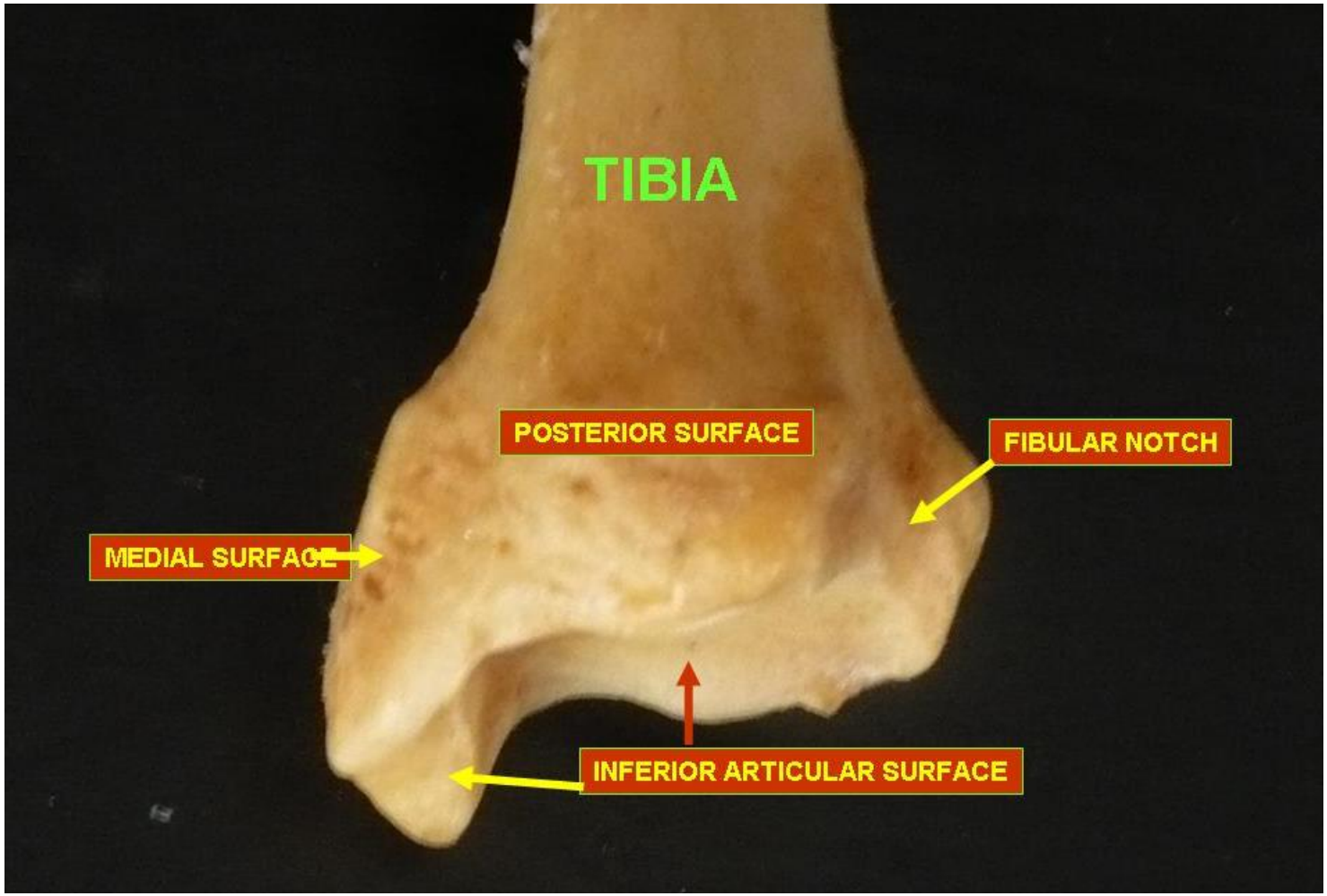
❖At the upper end are the lateral and medial condyles, which articulate with the lateral and medial condyles of the femur.

❖Separating the upper articular surfaces of the tibial condyles is the intercondylar eminence.





The lower end of the tibia shows a wide, rough depression on its lateral surface for articulation with the fibula.

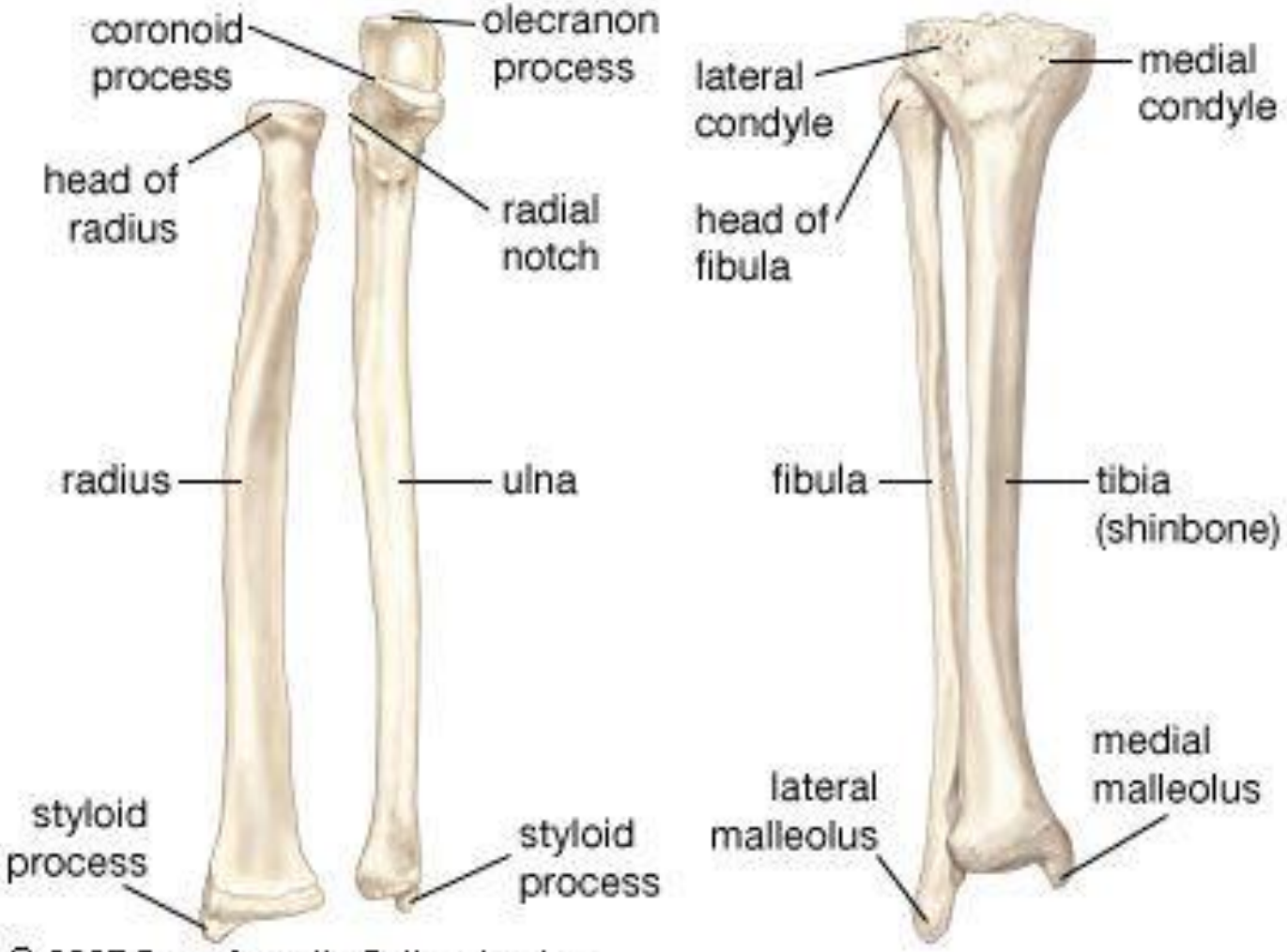


FIBULA

❖The fibula provides attachment for muscles.
❖It takes no part in articulation at the knee joint,
❖ but below, it forms part of the ankle joint.
❖The **head** forms the upper end of the fibula.
❖It has a **styloid process,**
❖it possesses an **articular sursurface** for articulation with the lateral condyle of the tibia.
❖ **The shaft** is attached to the tibia by the interosseous membrane.
❖The lower end of the fibula forms the **lateral malleolus.**

Interosseous membrane

Leg’s and Forearm’s Bone

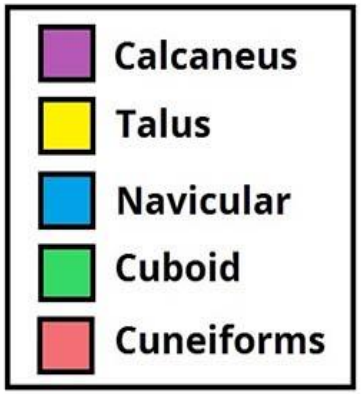


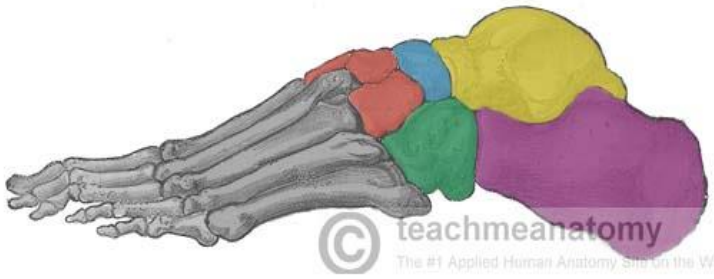
Bones of the Foot

TARSAL BONES

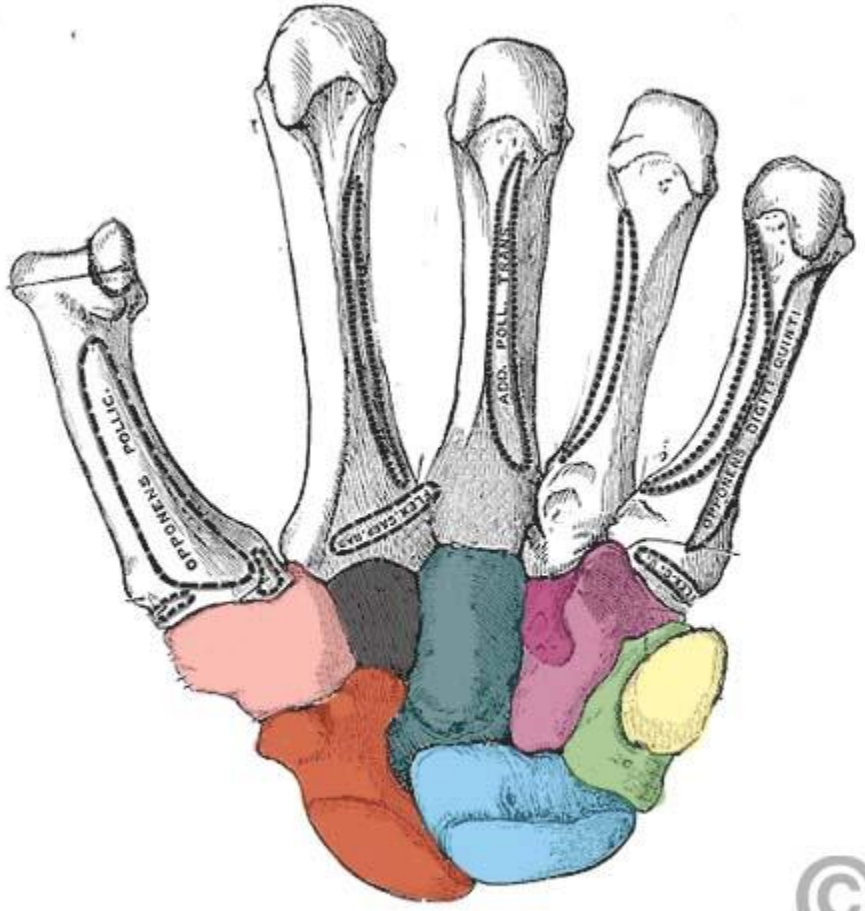
The tarsal bones are:

1) the calcaneum
2) the talus
3) the navicular
4) the cuboid
5) and the three cuneiform bones.

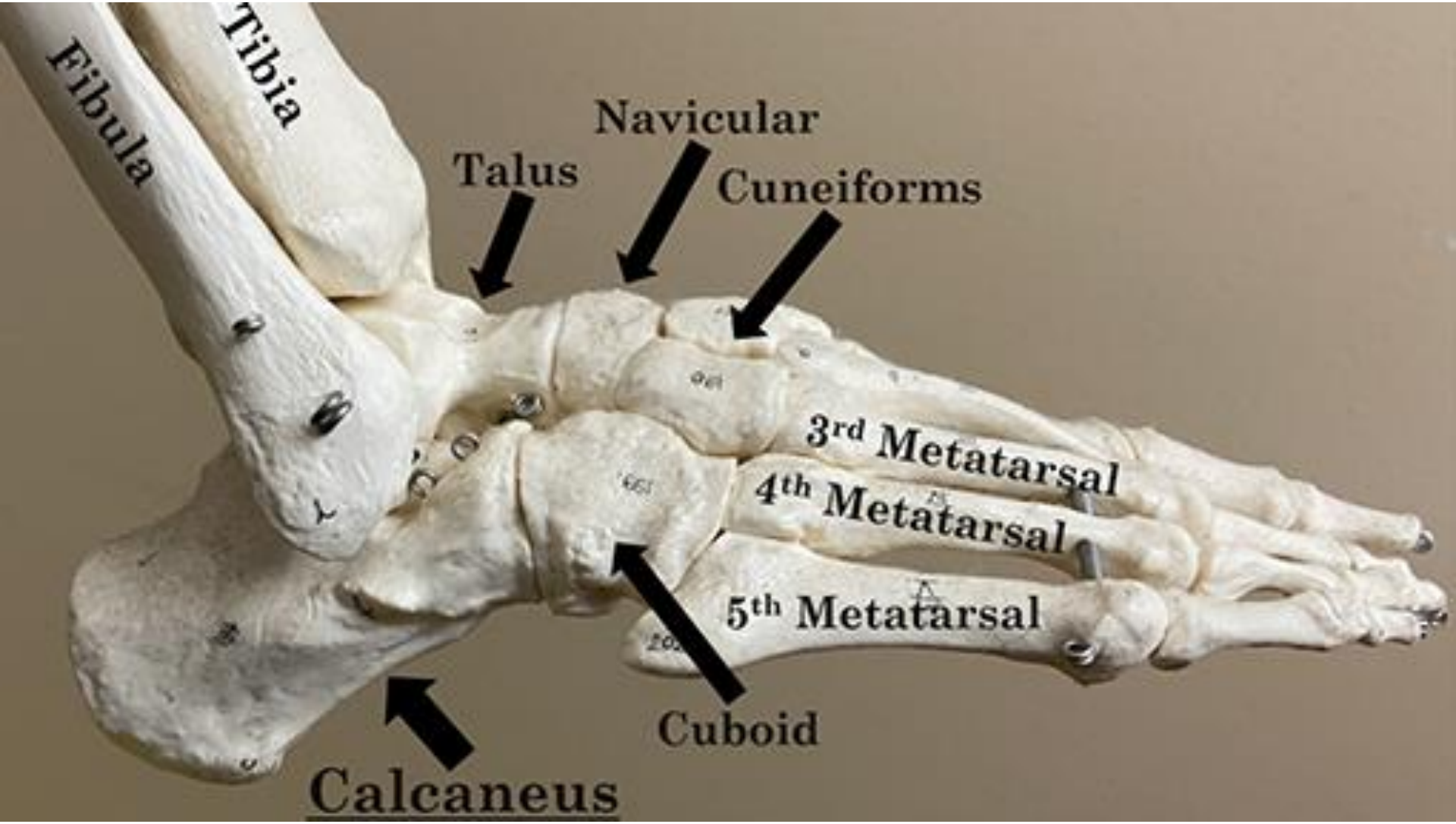




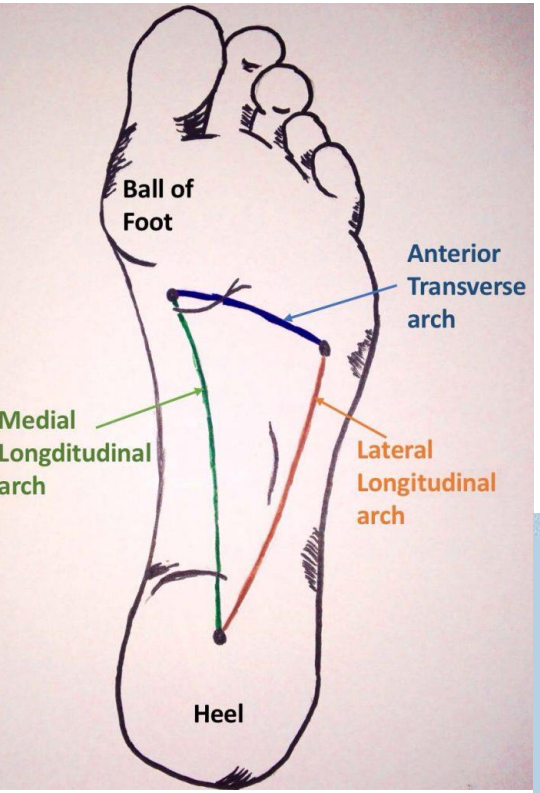
Carpal bone [for comparison]

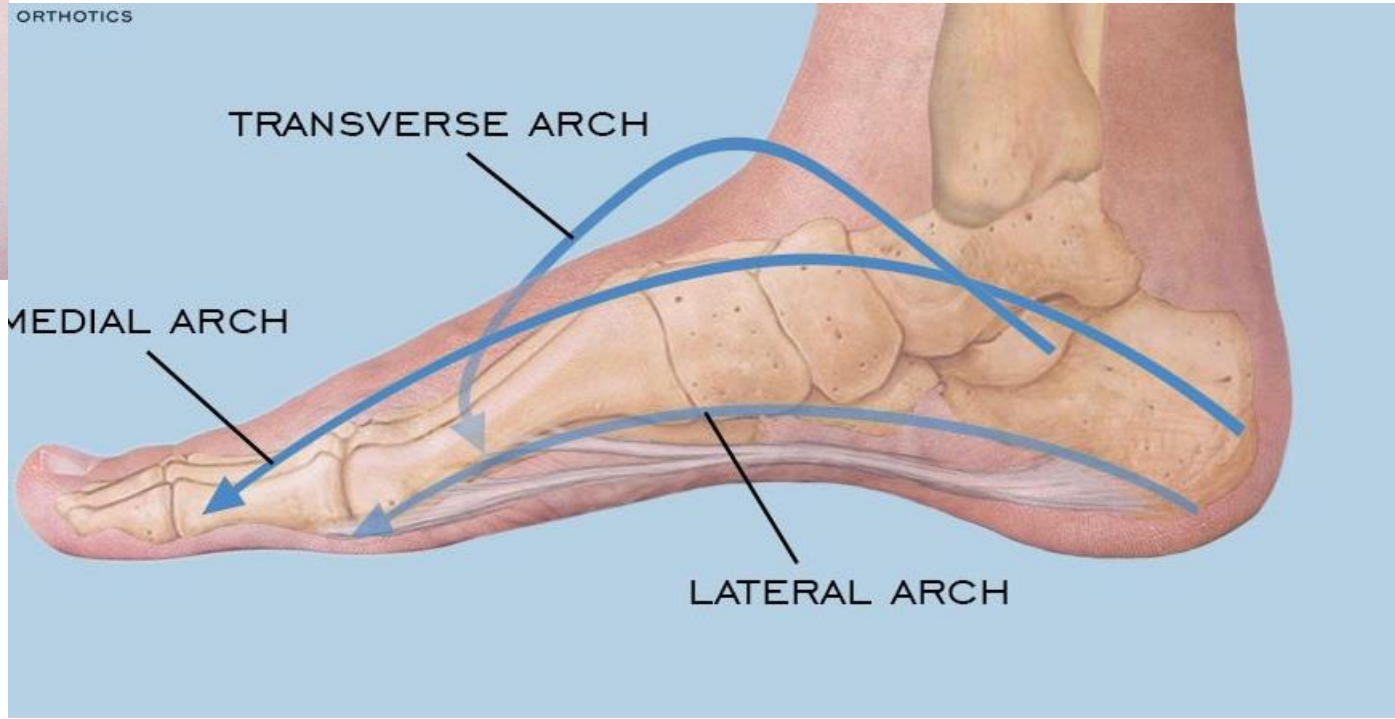


- Scaphoid
- Lunate
- Triquetrum
- Pisiform
- Trapezium
- Trapezoid
- Capitate
- Hamate


Fibula
Tibia
Talus
Navicular
Cuneiforms
3rd Metatarsal
4th Metatarsal
5th Metatarsal
Cuboid
Calcaneus

Foot arches


Ball of Foot
Anterior Transverse arch
Medial Longditudinal arch
Lateral Longitudinal arch
Heel

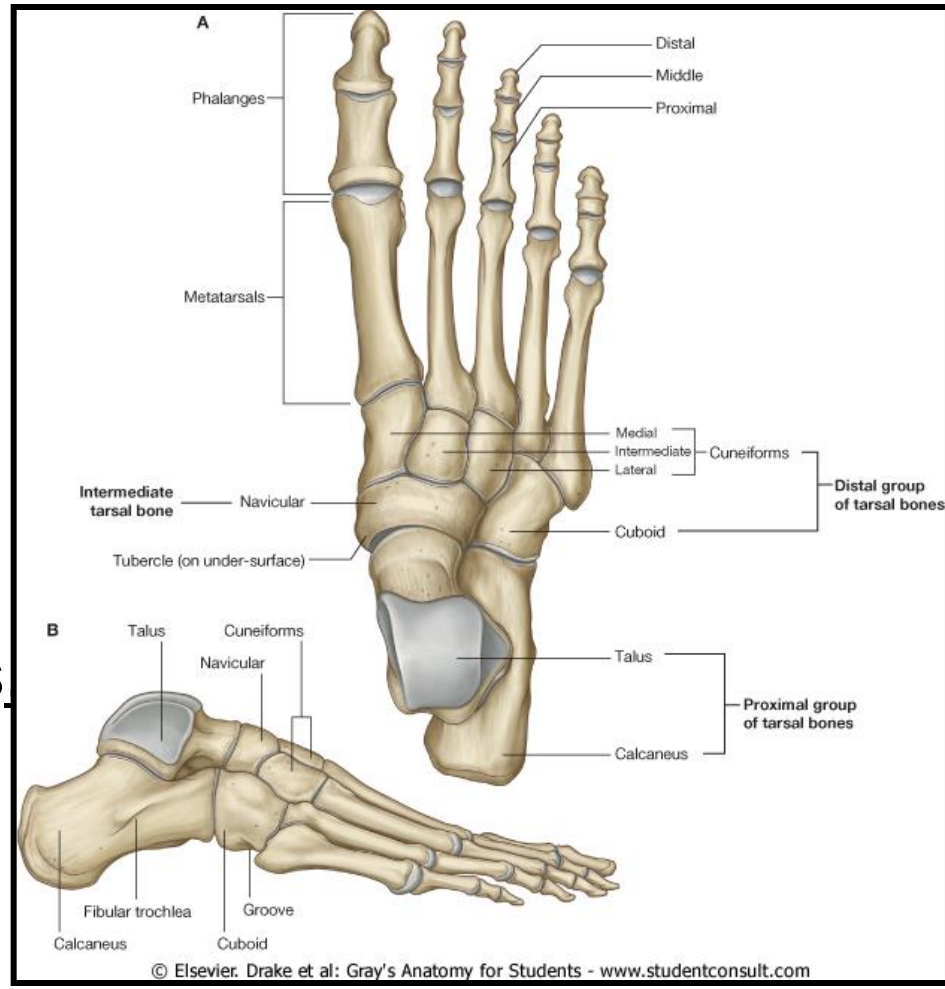

ORTHOTICS
TRANSVERSE ARCH
MEDIAL ARCH
LATERAL ARCH

METATARSAL BONES AND PHALANGES

❖The metatarsal bones and the phalanges *resemble* the metacarpal bones and the phalanges of the hand

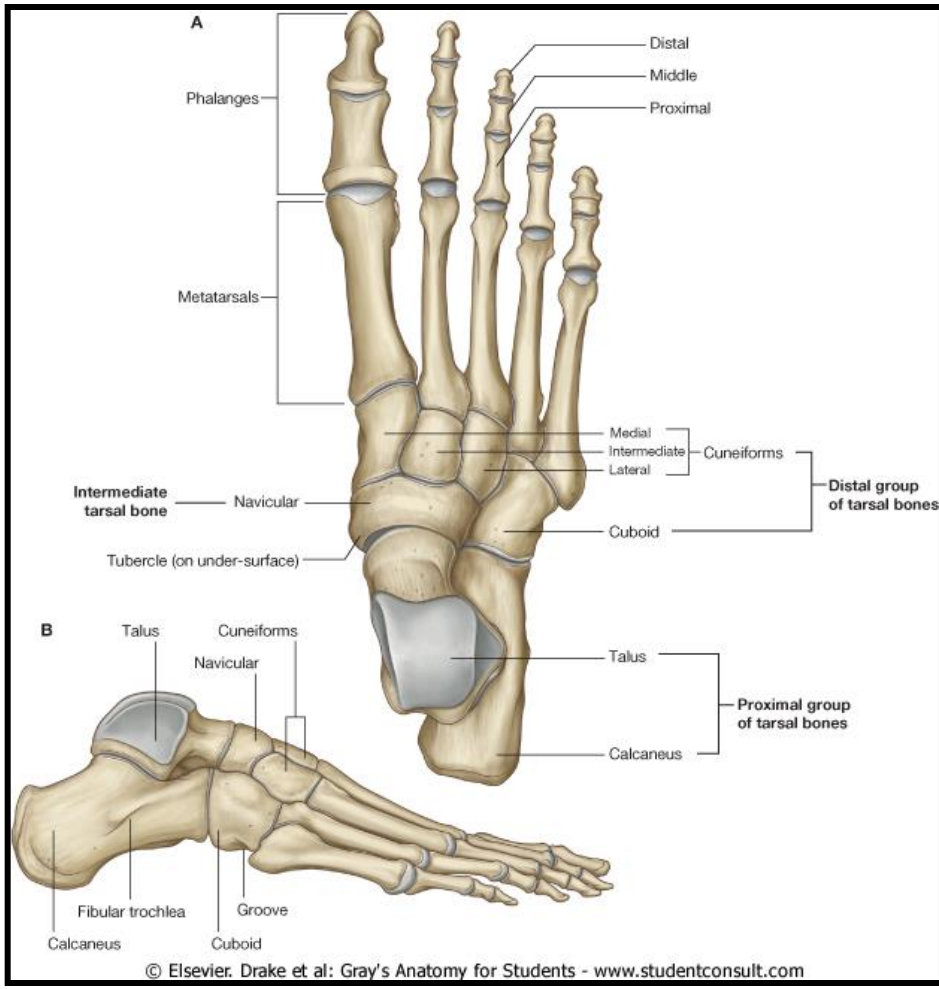
❖ Each possesses a distal head, shaft, and proximal base

❖There are five metatarsal bones, and they are numbered from the medial to the lateral side.

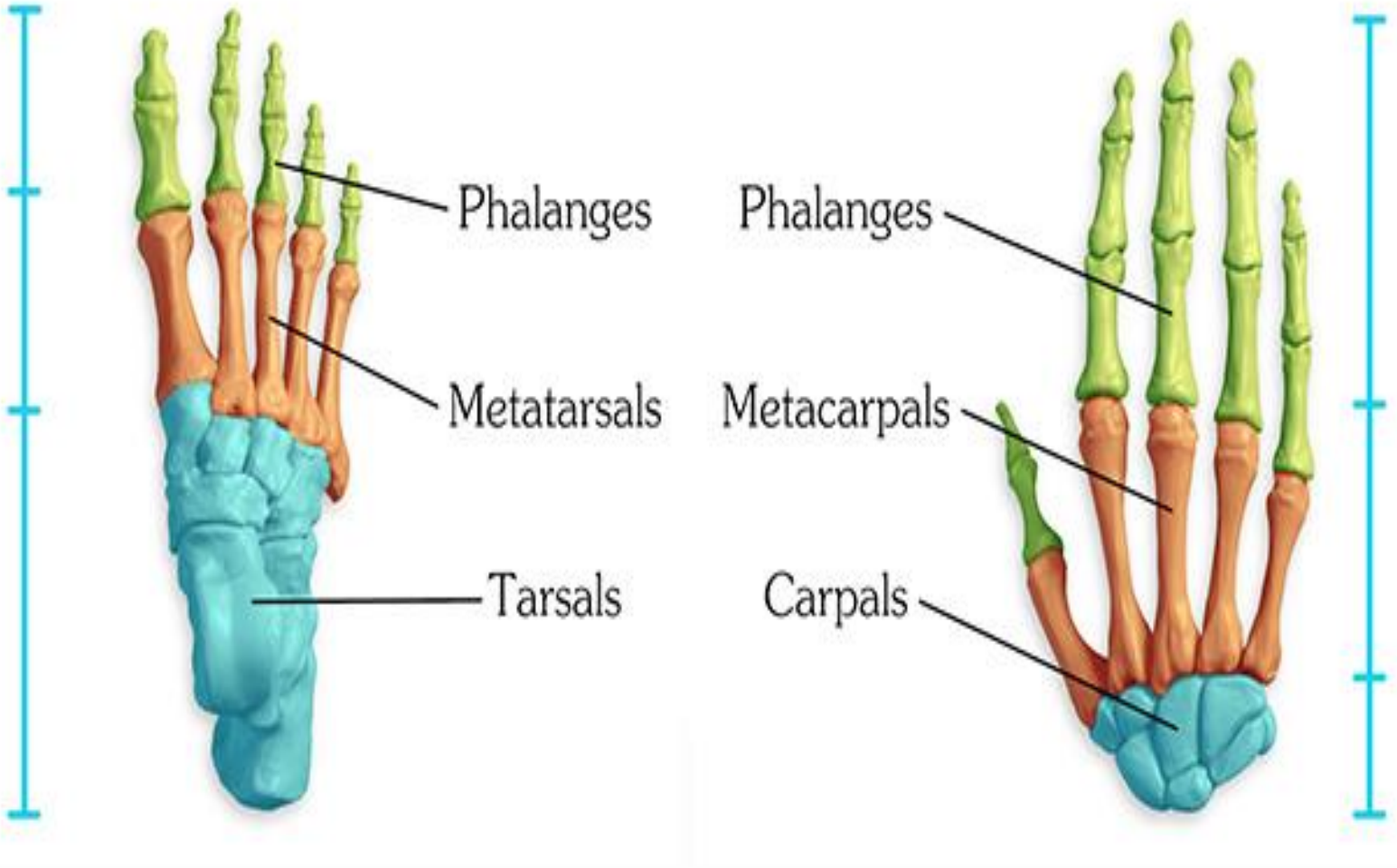


METATARSAL BONES AND PHALANGES

- The fifth metatarsal has a prominent tubercle on its base, which can be easily palpated along the lateral border of the foot.
- The tubercle provides attachment to the peroneus brevis tendon.
- Except for the big toe, each toe has three phalanges. The big toe possesses only two.



Metatarsal vs Metacarpal



Joints

Joint	Bones	Type	Movements
Hip joint	Pelvis and femur	Ball and socket	Flexion, extension, abduction, adduction and circumduction
Knee joint	Femur, tibia and patella	Hinge	Flexion and extension
Ankle joint	Tibia, fibula and talus (a tarsal bone)	gliding	Plantarflexion and dorsiflexion