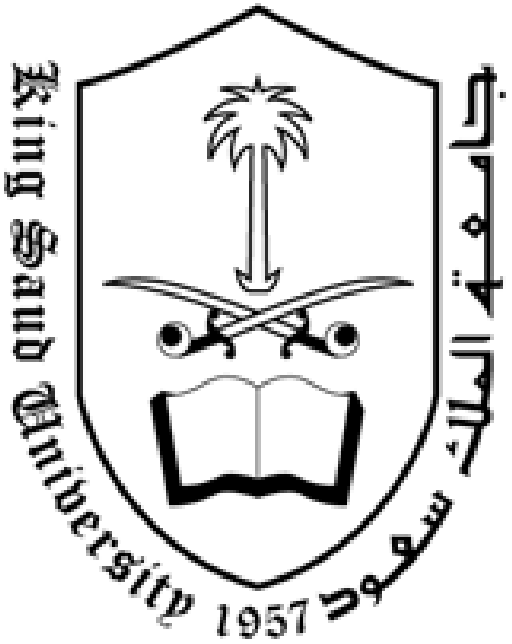
BONES OF LOWER LIMB



ANATOMY DEPARTMENT

Dr. Mohammad Saeed Vohra

OBJECTIVES

- ***At the end of the lecture the students should be able to:***

- **Classify the bones** of the three regions of the lower limb (thigh, leg and foot).
- **Differentiate the bones of the lower limb** from the bones of the upper limb
- **Memorize the main features of the**
  - Bones of the thigh (femur & patella)
  - Bones of the leg (tibia & Fibula)
  - Bones of the foot (tarsals, metatarsals and phalanges)
- **Recognize the side of the bone**

BONES OF THIGH (Femur and Patella)

Femur:

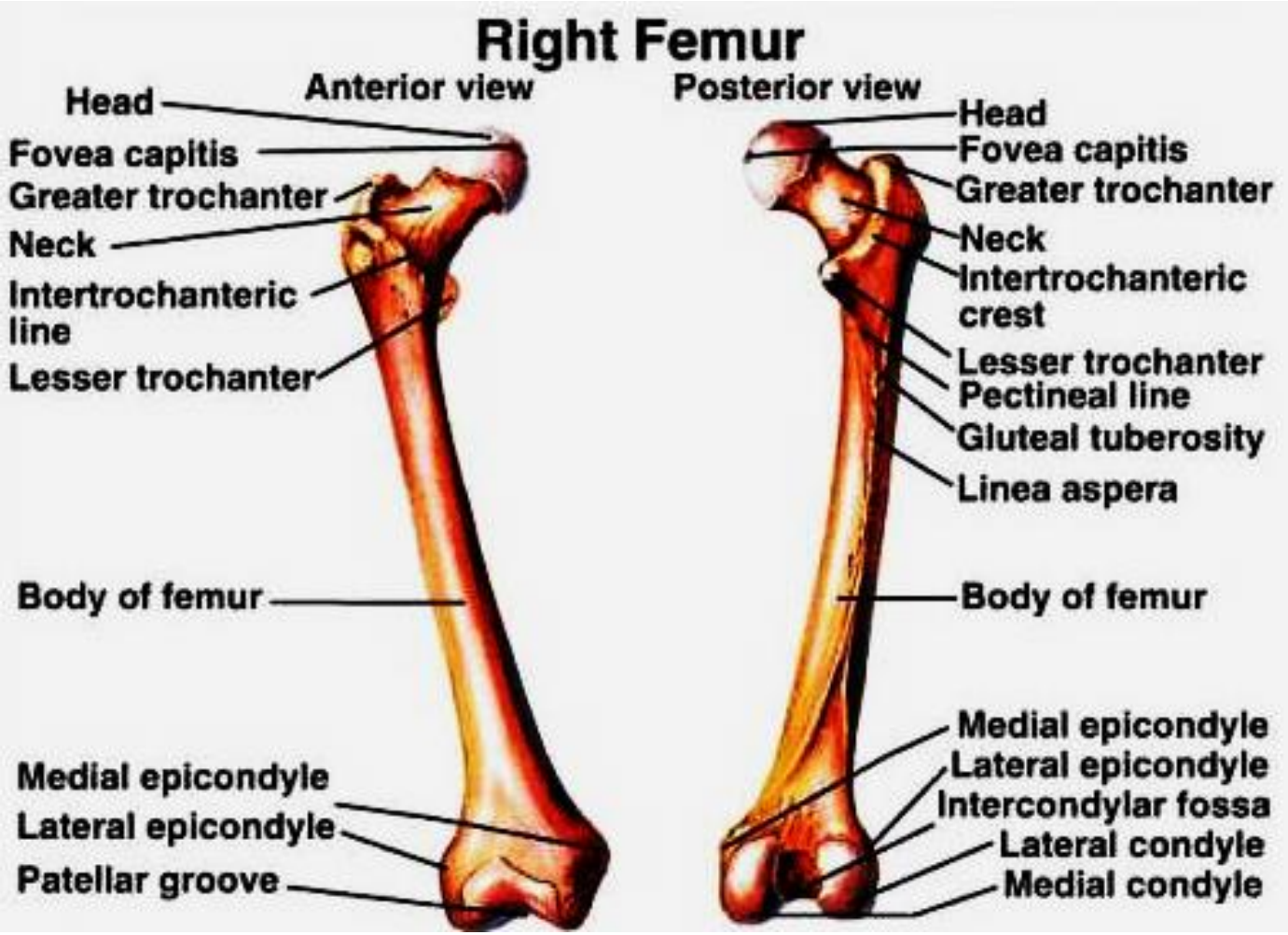
- Articulates above with acetabulum of hip bone to form the hip joint
- Articulates below with tibia and patella to form the knee joint

BONES OF THIGH (Femur and Patella)

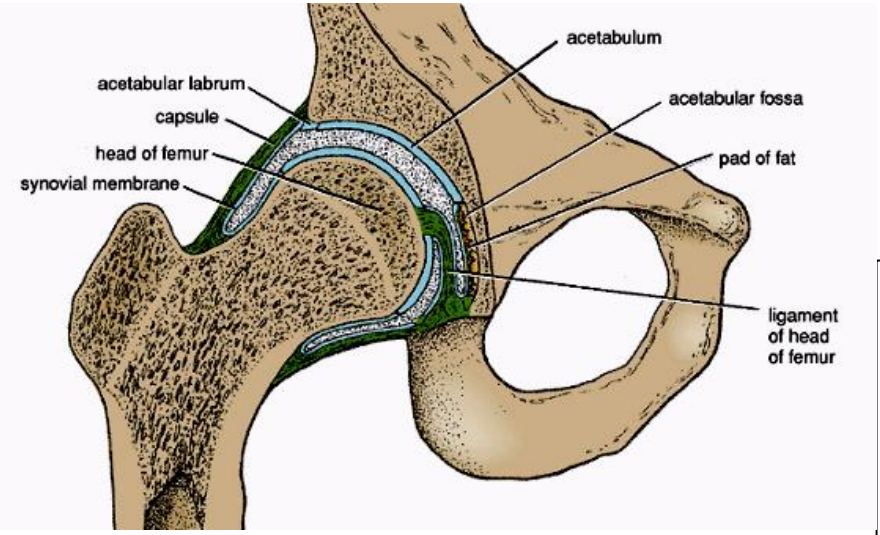
- **Femur**

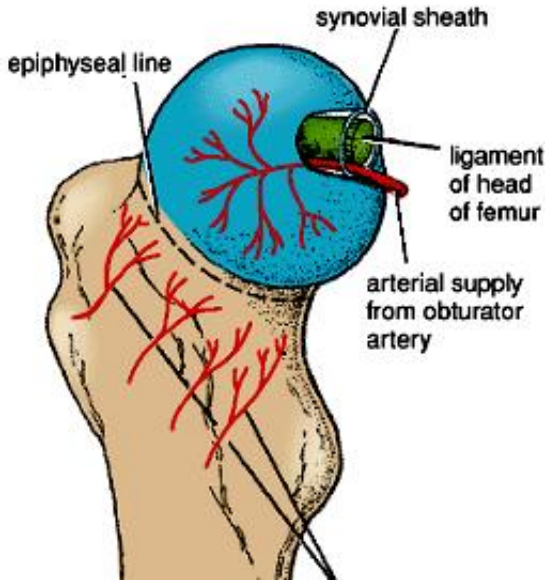
Consists of:

- Upper end
- Shaft
- Lower end



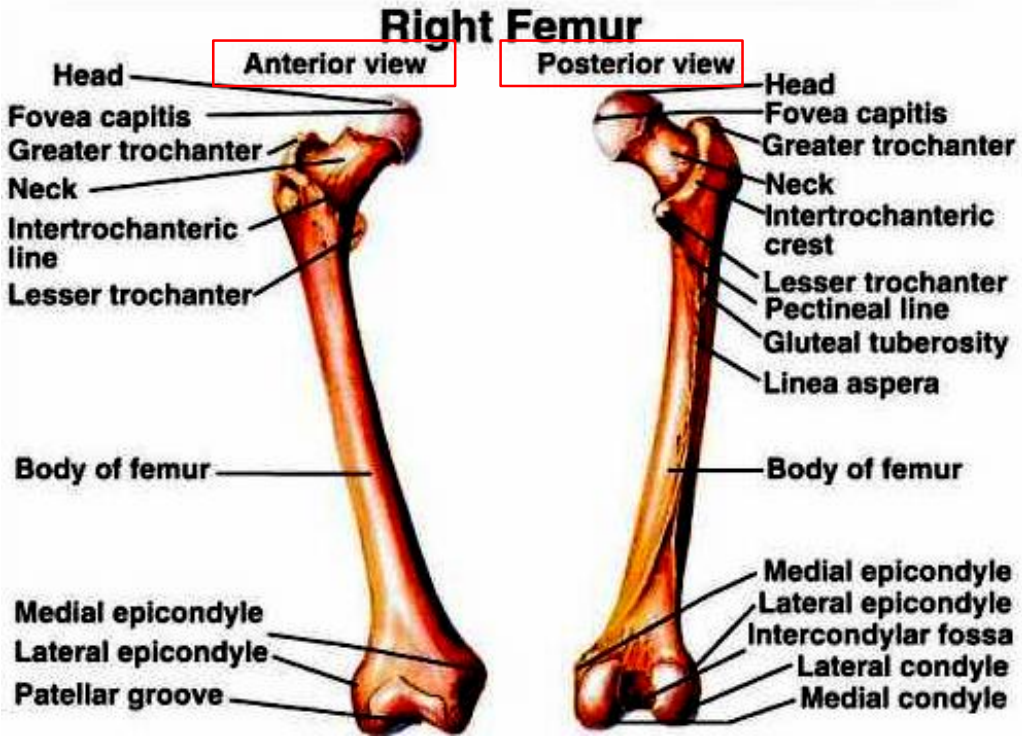
UPPER END OF FEMUR





- **Head:**
- It articulates with acetabulum of hip bone to form hip joint
- Has a depression in the center (fovea capitis), for the attachment of ligament of the head
- Obturator artery passes along this ligament to supply head of femur
- **Neck:**
- It connects head to the shaft

UPPER END OF FEMUR



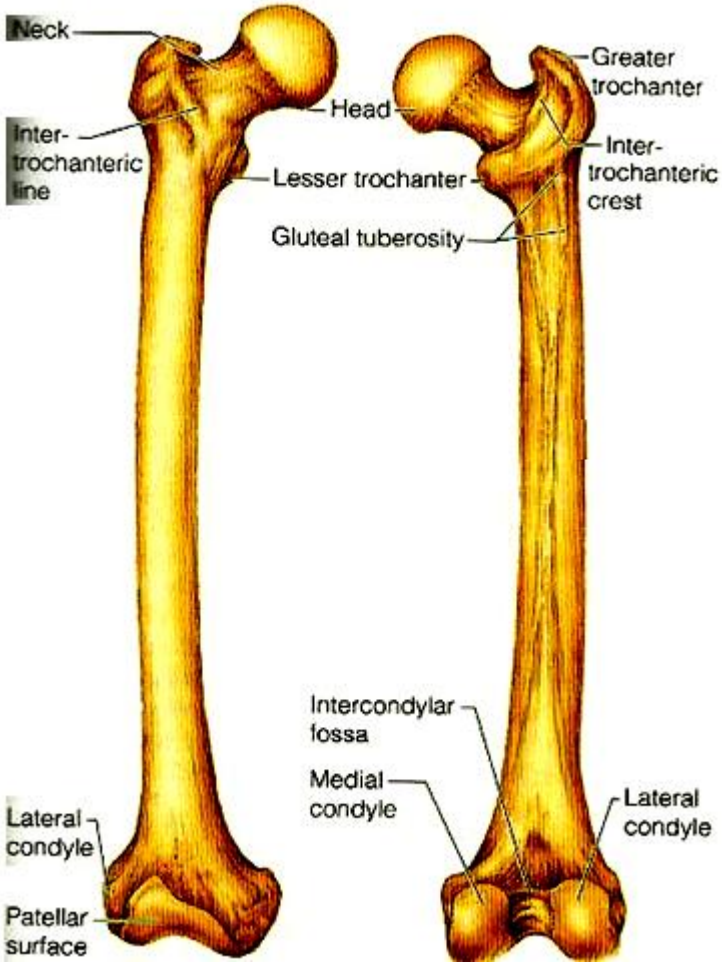
- **Greater and lesser trochanters**
- **Anteriorly**

connecting the 2 trochanters the **inter-trochanteric line,** where the ***iliofemoral ligament*** is attached

- **Posteriorly**

the **inter-trochanteric crest,** on which is **the quadrate tubercle**

SHAFT OF FEMUR



It has 3 borders

Two rounded medial and lateral

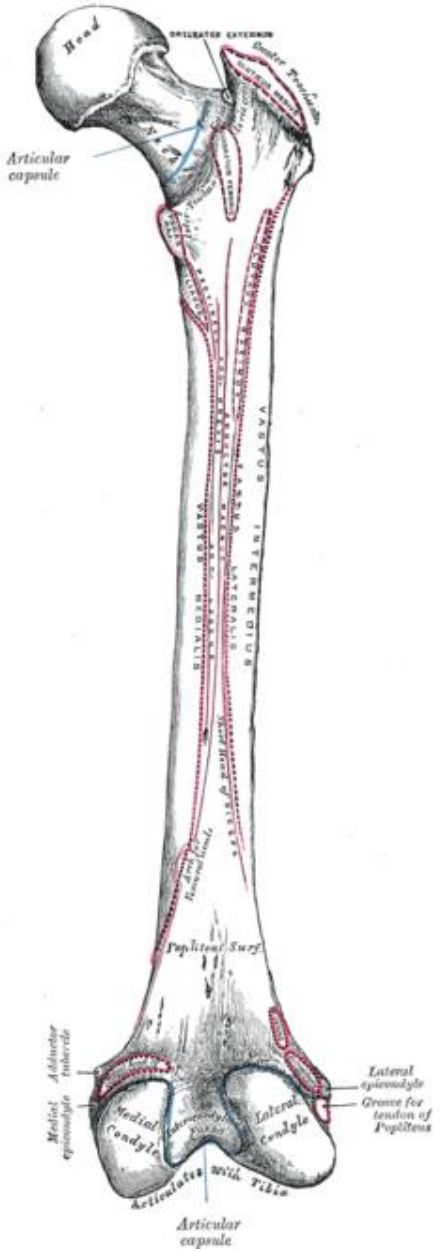
One thick posterior border or ridge called **linea aspera**

It has 3 surfaces

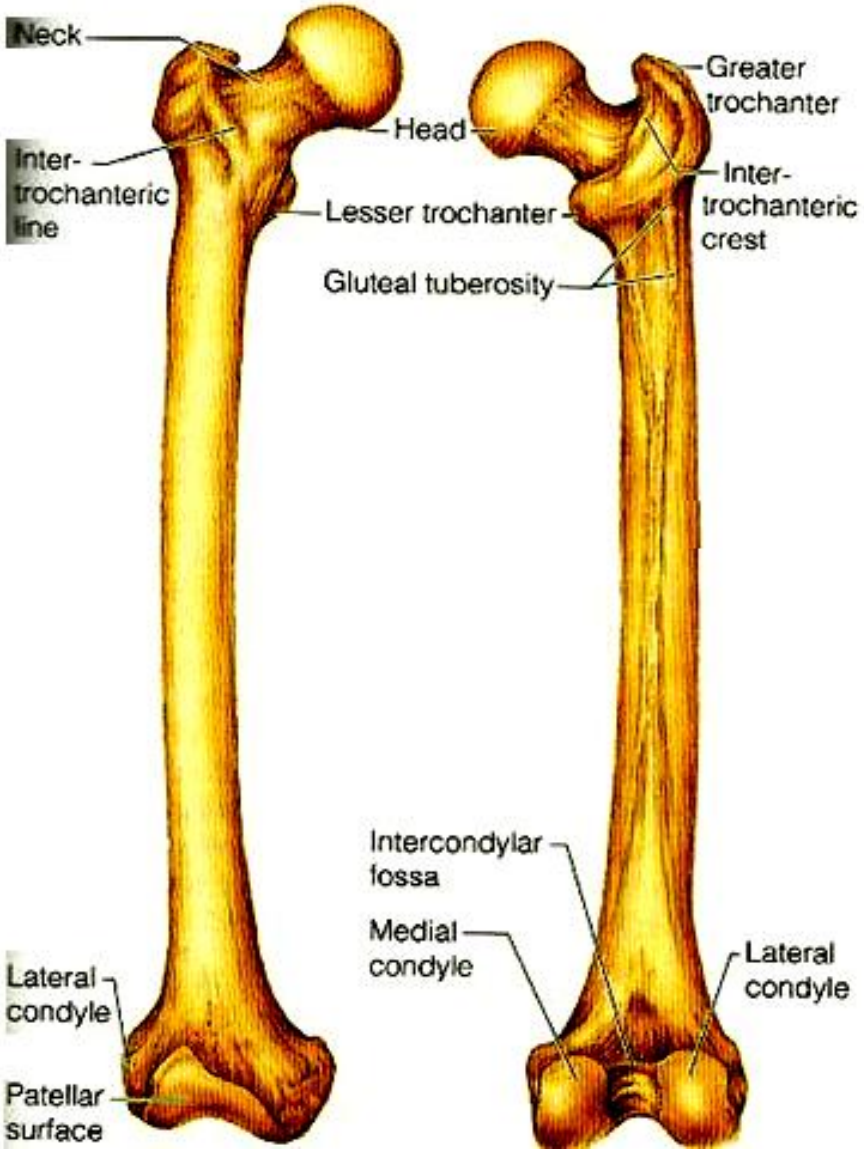
Anterior

Medial

Lateral

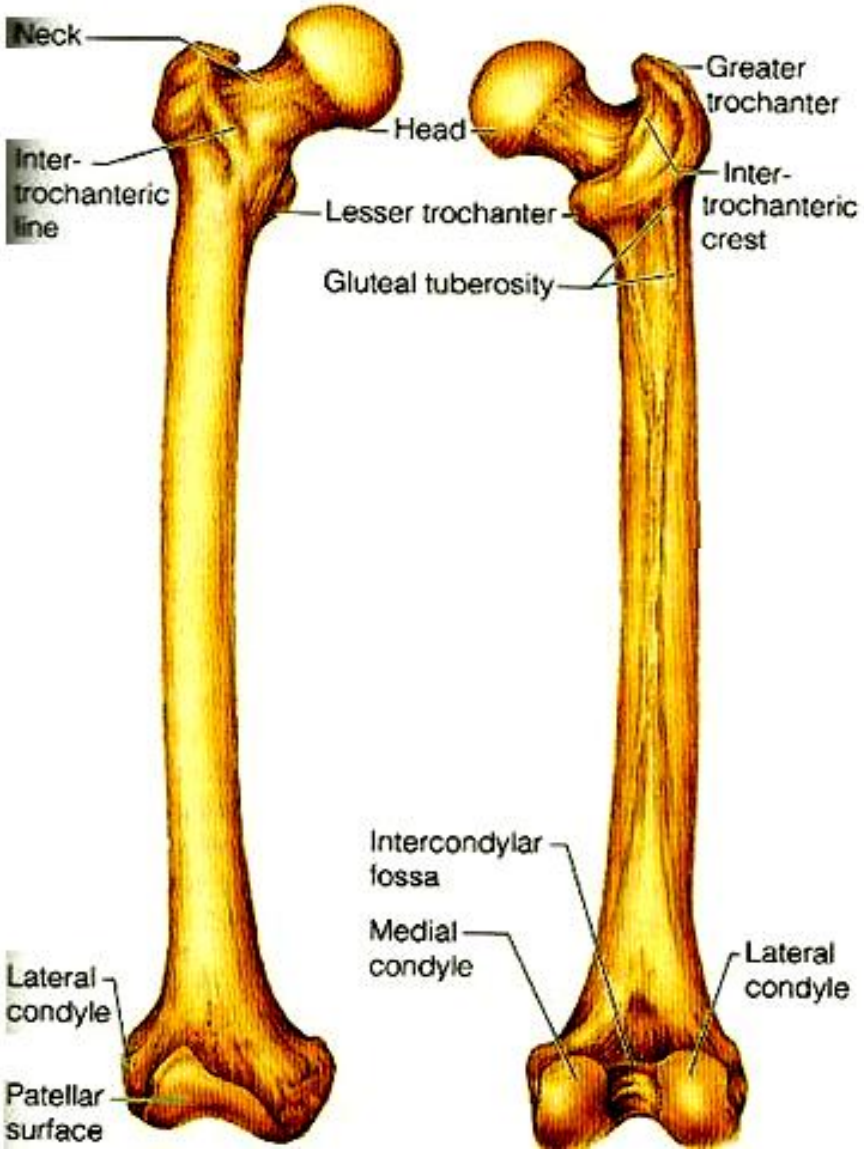


SHAFT OF FEMUR



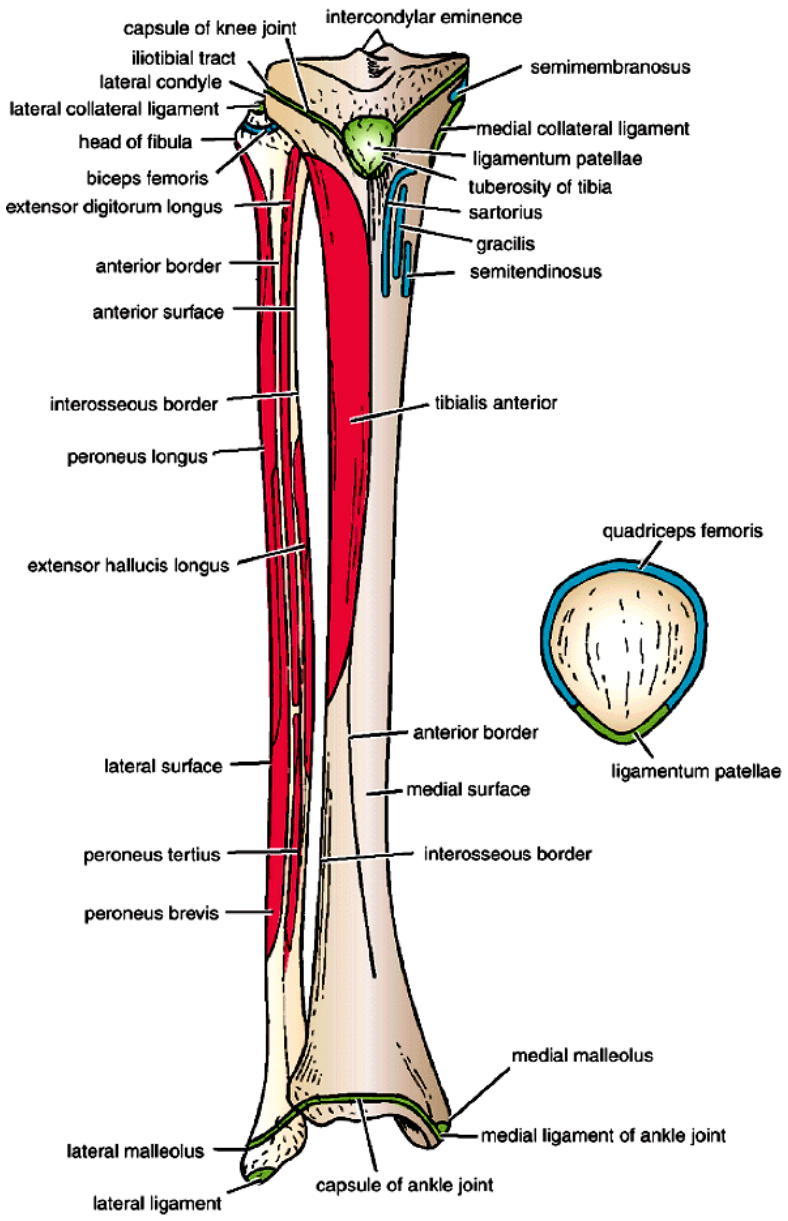
- **Posteriorly:** below the greater trochanter is the gluteal tuberosity for attachment of gluteus maximus muscle
- **The medial margin of linea aspera continues below as medial supracondylar ridge**
- **The lateral margin becomes continues below with the lateral supracondylar ridge**
- **A Triangular area, the popliteal surface lies at the lower end of shaft**

LOWER END OF FEMUR



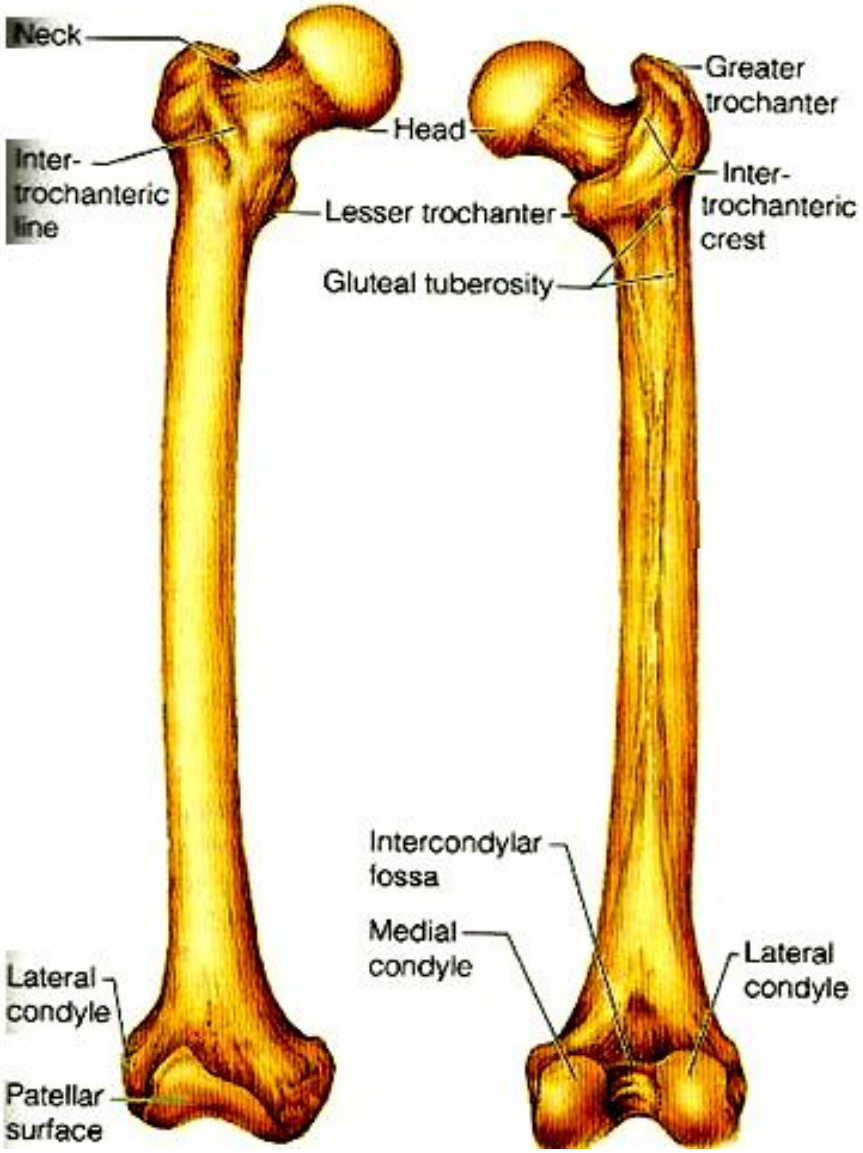
- Has lateral and medial condyles, separated anteriorly by articular patellar surface, and posteriorly by intercondylar notch or fossa
- The 2 condyles take part in the knee joint
- Above the condyles are the medial & lateral epicondyles

PATELLA



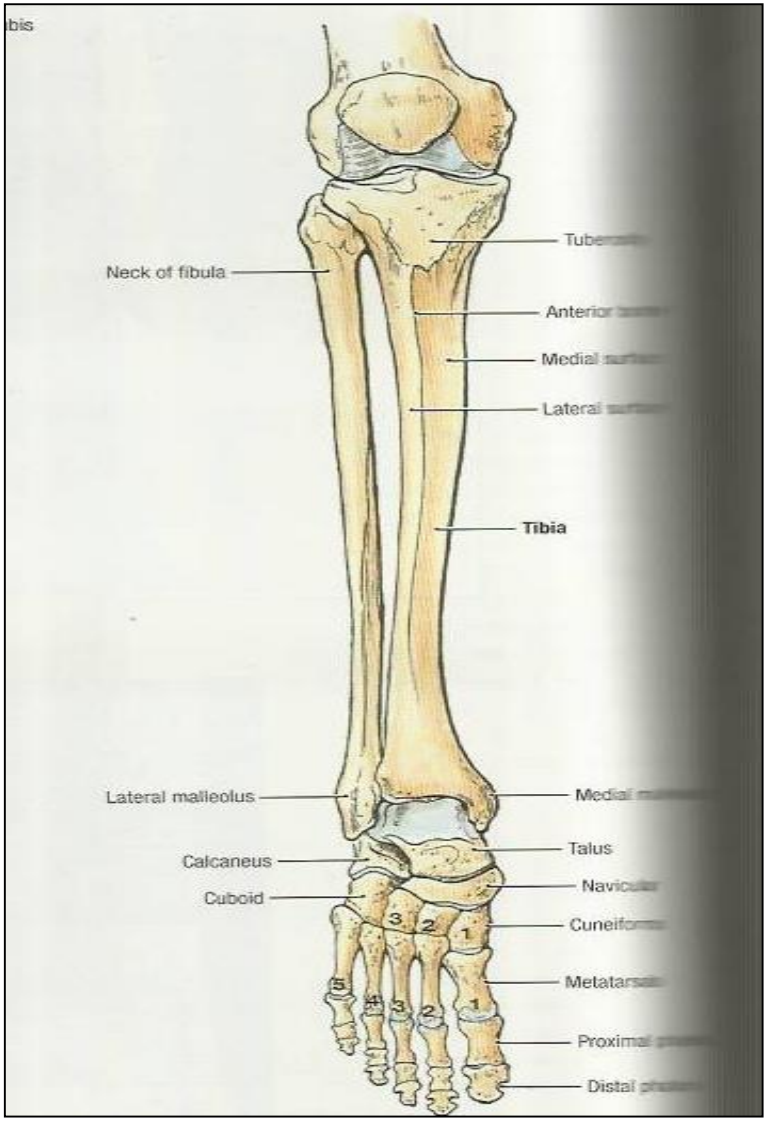
- **It is a largest sesamoid bone** (lying inside the Quadriceps tendon in front of knee joint)
- **Its anterior surface** is rough and **subcutaneous**
- Its posterior surface articulates with the condyles of the femur to form knee joint
- Its apex lies inferiorly and is connected to tuberosity of tibia by ligamentum patellae
- Its upper, lateral, and medial margins give attachment to Quadriceps femoris muscles

POSITION OF FEMUR (RIGHT OR LEFT)



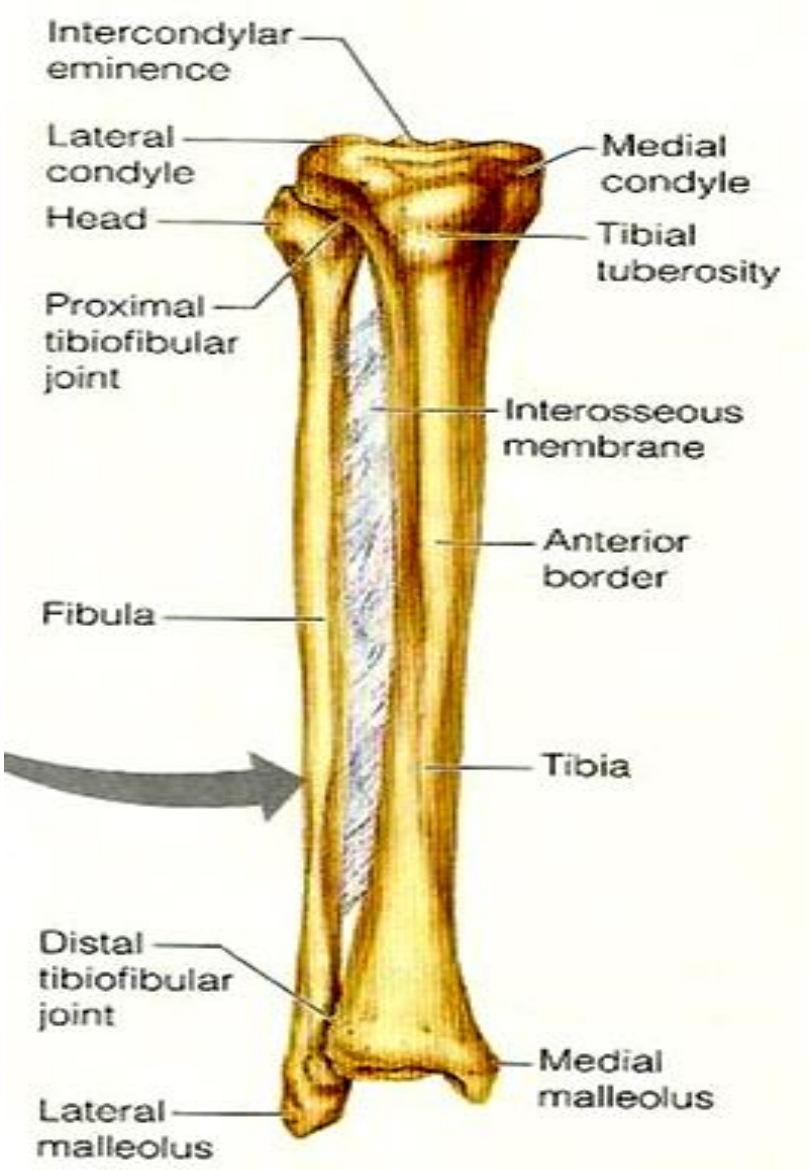
- **Head** is directed upward & medially
- **Shaft** is smooth and convex anteriorly
- **Shaft** is rough and concave posteriorly

BONES OF LEG (TIBIA AND FIBULA)



- **Tibia**
- It is the medial bone of leg
- **Fibula**
- It is the lateral bone of leg
- **Each of them has**
  - upper end
  - shaft
  - lower end

TIBIA



Upper end has

- **Two tibial condyles**

  Medial condyle

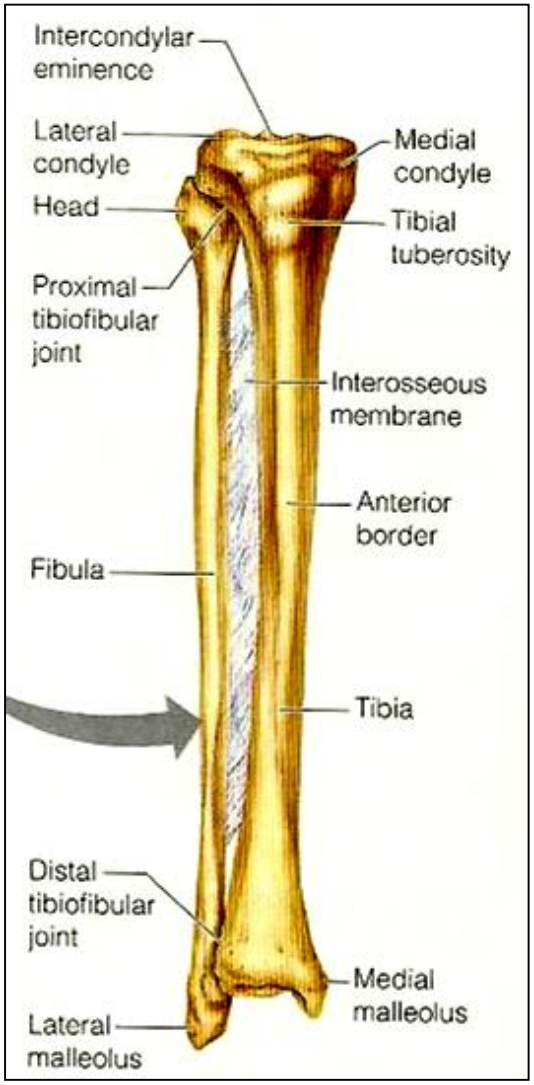
  Is larger and articulate with medial condyle of femur. It has a groove on its posterior surface for semimembranosus muscle

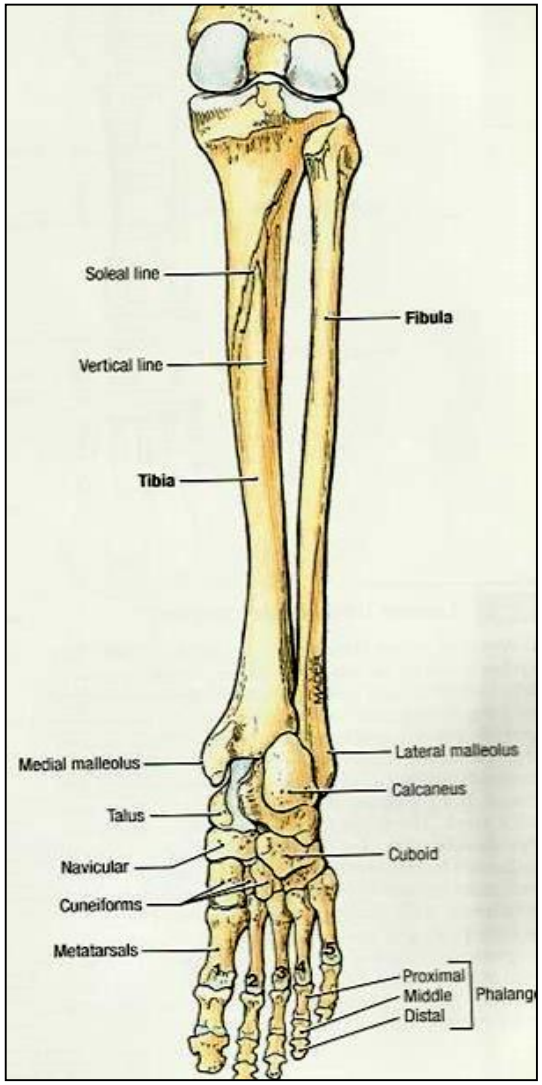
  Lateral condyle

  Is smaller and articulates with lateral condyle of femur. It has facet on its lateral side for articulation with head of fibula to form proximal tibio-fibular joint

- **Intercondylar area**
  is rough and has intercondylar eminence

TIBIA

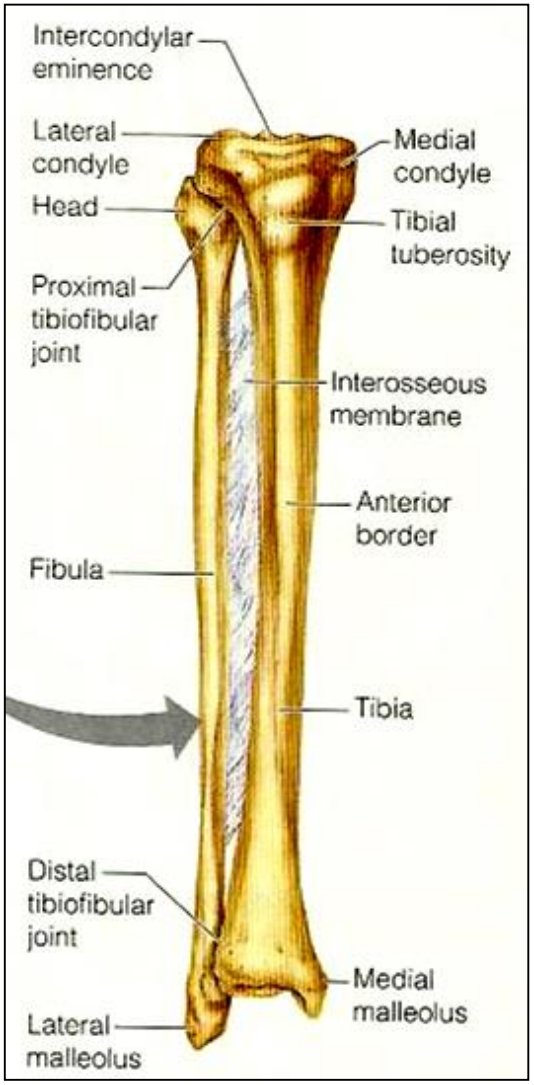


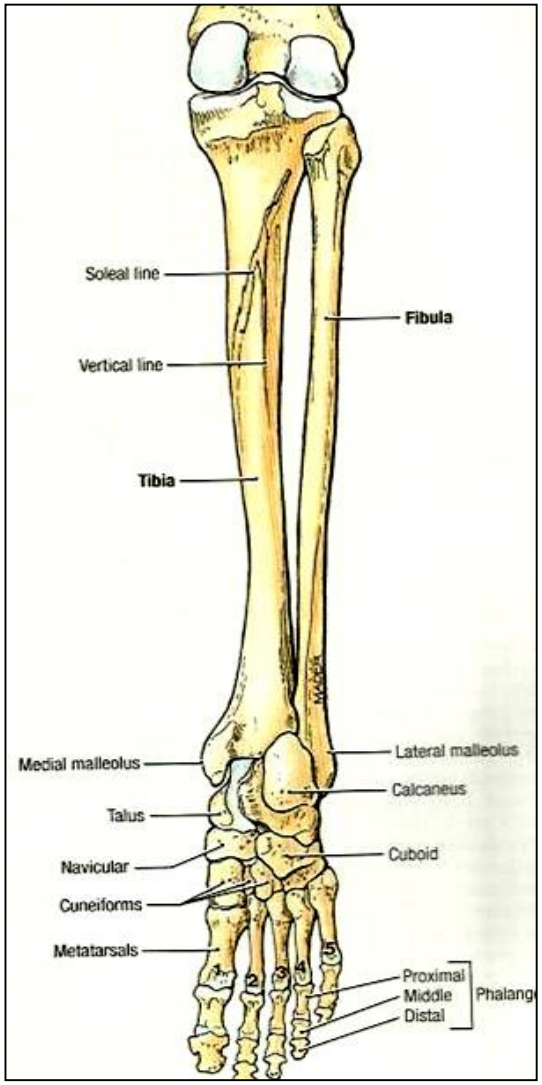


Shaft has

- **Tibial tuberosity**
  - Its upper smooth part gives attachment to ligamentum patellae.
  - Its lower rough part is subcutaneous
- **3 borders**
  - Anterior boder is sharp and subcutaneous
  - Medial border
  - Lateral border also called interosseous border.
- **3surfaces**
  - Medial : subcutaneous.
  - Lateral
  - Posterior has oblique line, soleal line for attachment of soleus muscle

TIBIA

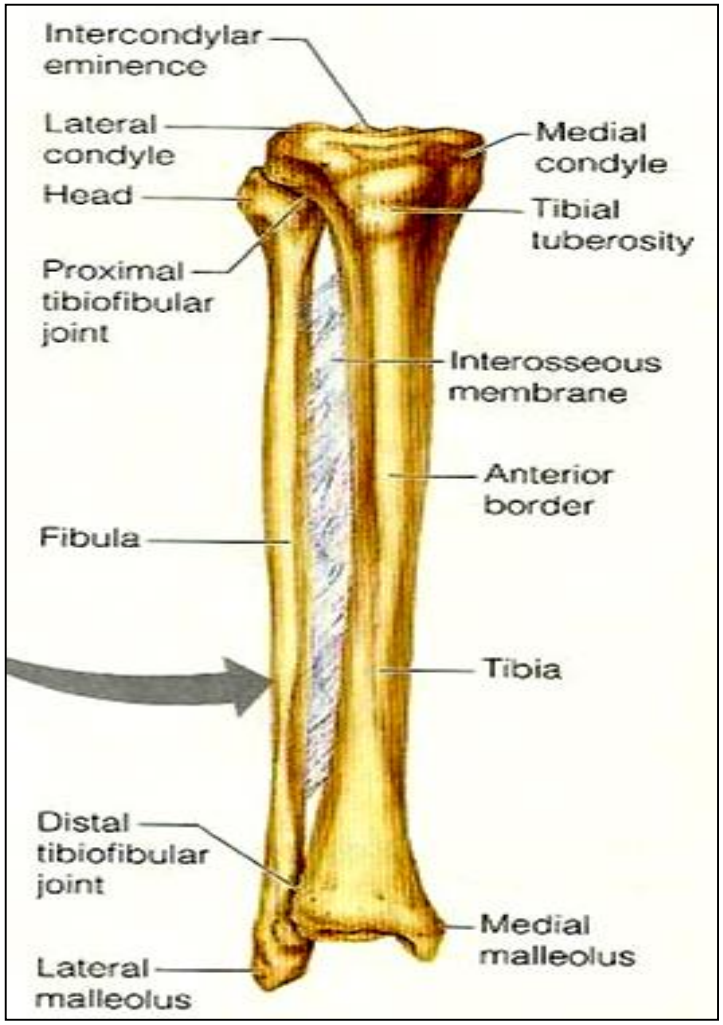




Lower end

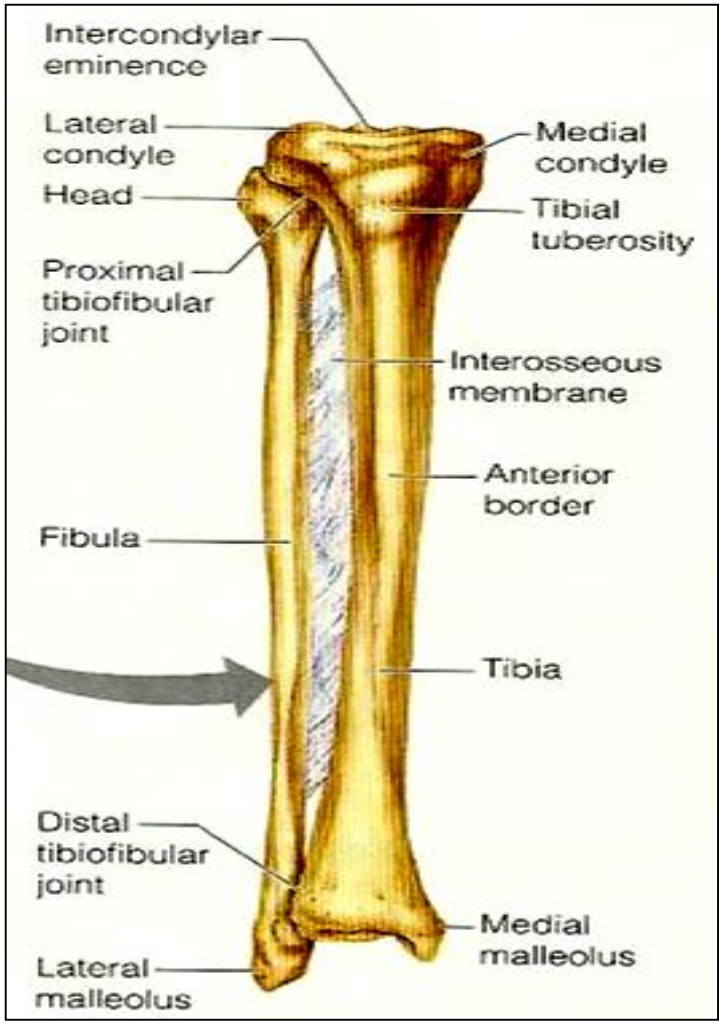
- Articulates with talus for formation of ankle joint.
- Its medial surface is subcutaneous (medial malleolus)
- Its lateral surface articulate with talus
- Fibular notch lies on its lateral surface of lower end to form distal tibiofibular joint

POSITION OF TIBIA (RIGHT OR LEFT)



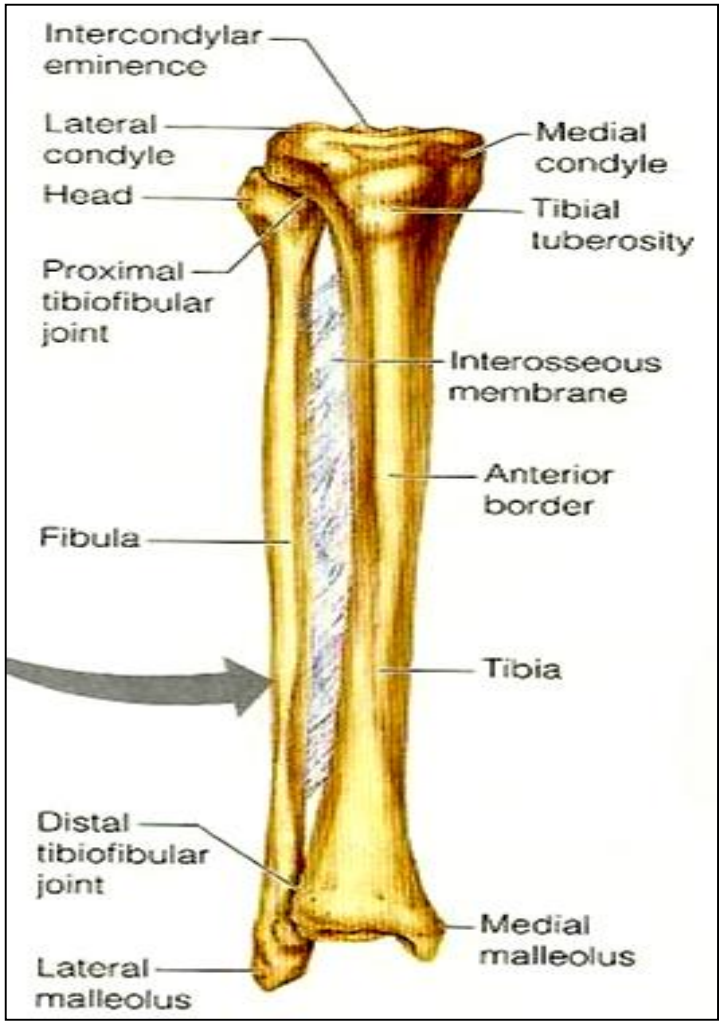
- **Upper end** is larger than lower end
- **Medial malleolus** is directed downward and medially
- **Shaft** has sharp anterior border

FIBULA



- It is the slender lateral bone of the leg.
- It takes no part in articulation of knee joint.
- **Its upper end has**
  - Head: articulates with lateral condyle of tibia
  - Styloid process.
  - Neck

FIBULA



Shaft has

- Four borders & 4 surfaces
  - Medial
  - interoseous border gives attachment to interosseous membrane

Lower end forms

- Lateral malleolus is **subcutaneous**
- Its medial surface is smooth for articulation with talus to form ankle joint

BONES OF FOOT

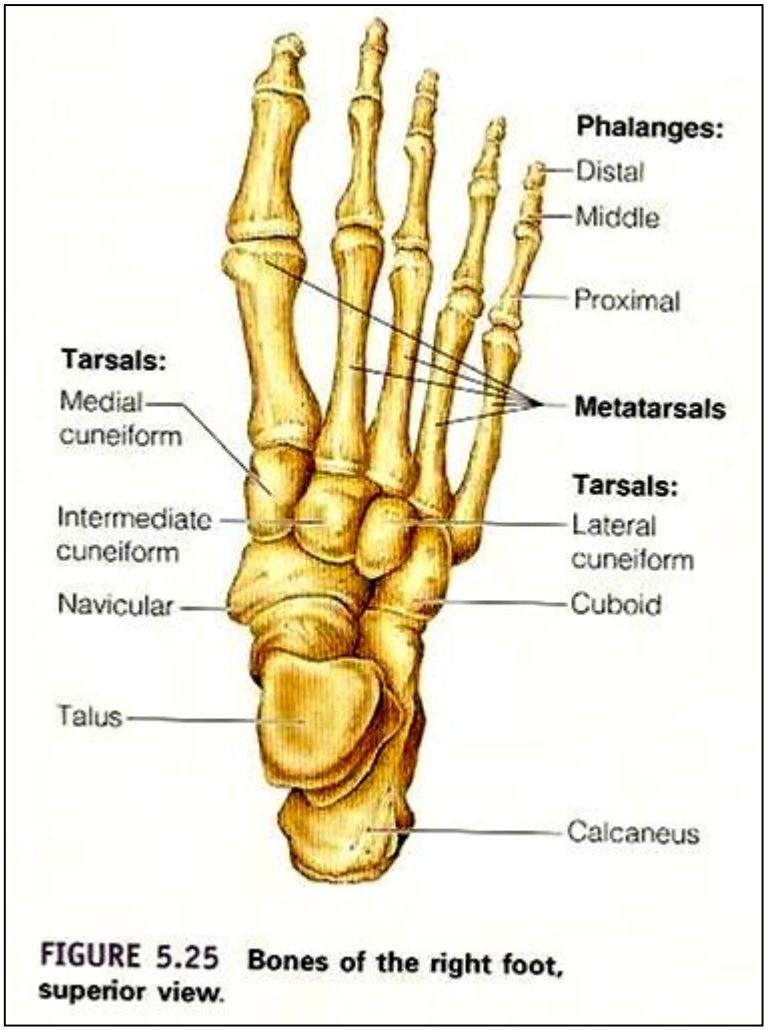


FIGURE 5.25 Bones of the right foot, superior view.

Seven Tarsal bones

start to ossify before birth and end ossification by 5th year in all tarsal bones. They are

1. Calcaneum
2. Talus
3. Navicular
4. Cuboid
5. Three cuneiform bones

- **Only Talus** articulates with tibia & fibula at ankle joint
- **Calcaneum:** the largest bone of foot, forming the heel

BONES OF FOOT

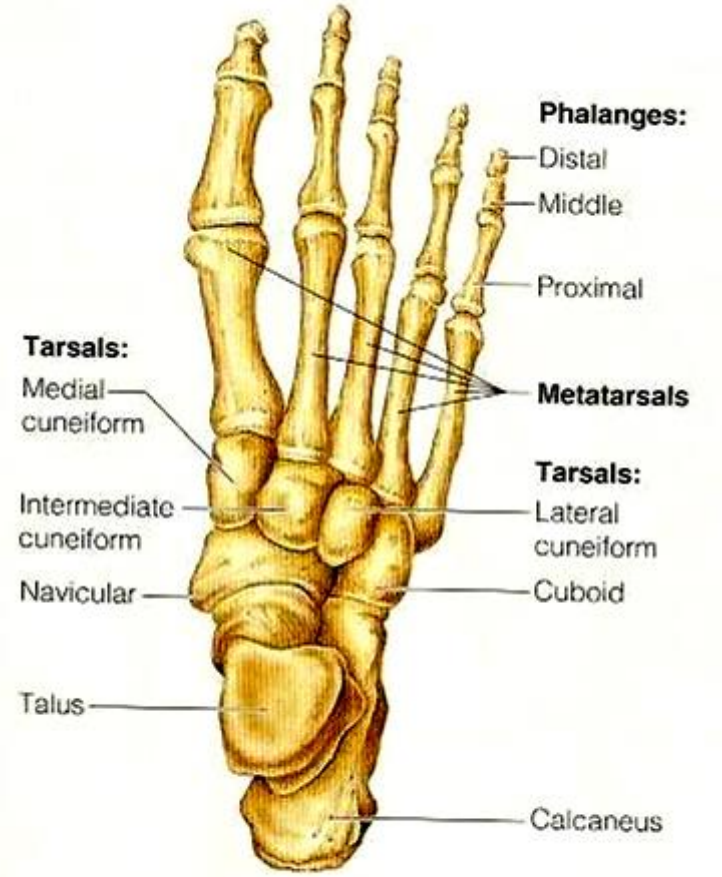


FIGURE 5.25 Bones of the right foot, superior view.

Five Metatarsal bones

- They are numbered from medial to lateral.
- 1st metatarsal bone is large and lies medially.
- Each metatarsal bone has a base (proximal) a shaft and a head (distal)

Fourteen phalanges

- Two phalanges for big toe (*proximal & distal*)
- Three phalanges for each of the lateral 4 toes (*proximal, middle & distal*)
- Each phalanx has base, shaft and a head.

SUMMARY

- **Skeleton of lower limb consists of:**
- **Femur:** is the bone of thigh.
- **Tibia:** is the medial bone of the leg.
- **Fibula:** is the lateral bone of leg.
- **Skeleton of foot:**
- **Tarsal bones** (7 in number), calcaneum is the largest bone forming the heel.
- **Metatarsal bones** (5 in number).
- **Phalanges** (14 in number).

The subcutaneous parts of bones in the lower limb are:

- Patella.
- Anterior border of the tibia
- Tibial tuberosity.
- Medial malleolus of tibia.
- Lateral malleolus of fibula.
- **The foot is a complex structure. There are 26 bones in each foot alone. The foot is also well muscled and is supported by ligaments and tissue known as fascia. Support is of prime importance in the foot, as it bears the weight of the body and must adopt different configurations to permit locomotion.**

THANK YOU