



MED437  
KING SAUD UNIVERSITY



# Bones of the Lower Limb

Lecture 2

Please check our [Editing File](#).

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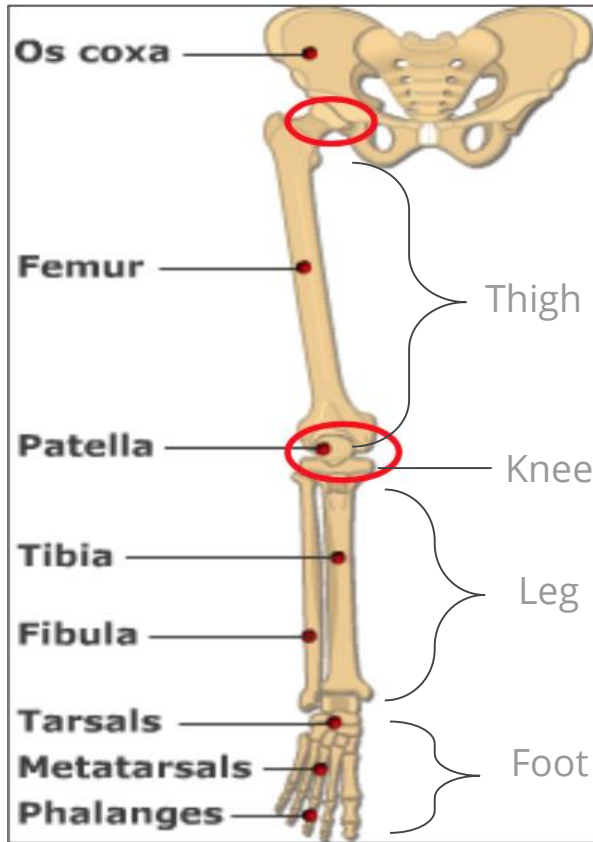
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{حَسْبُهُ}

# Objectives

- 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

- Text in **BLUE** was found only in the boys' slides
- Text in **PINK** was found only in the girls' slides
- **Text in RED is considered important**
- Text in **GREY** is considered extra notes

# Bones of Thigh (Femur and Patella)



## ❖ Femur:

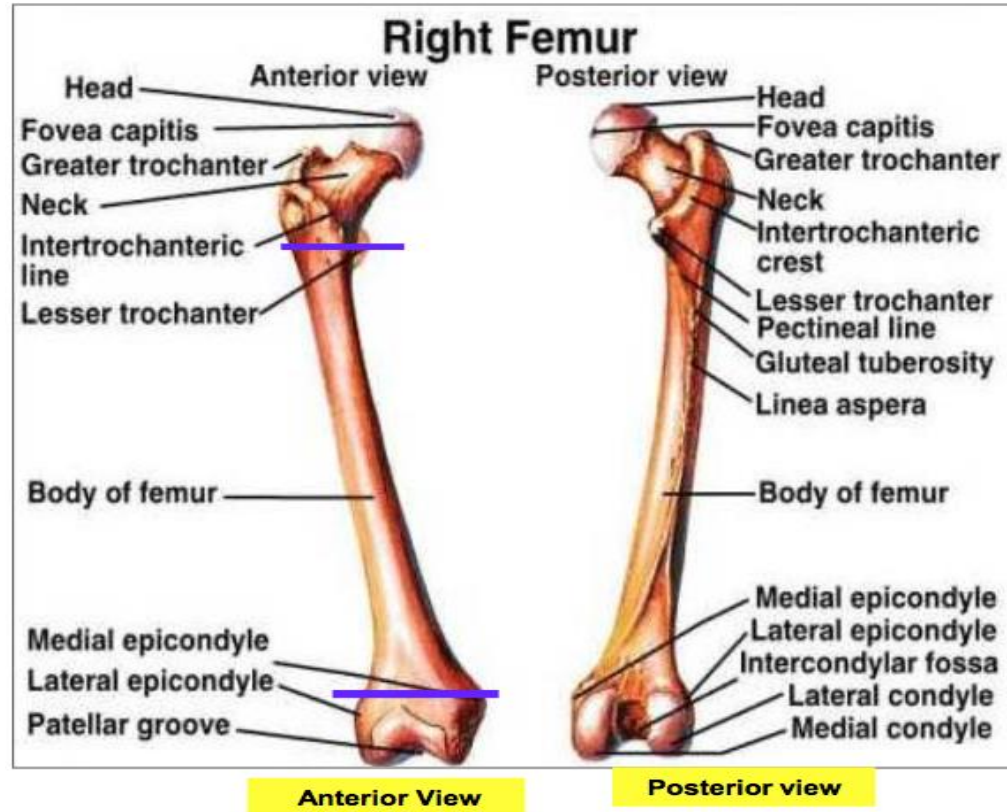
- Articulates above with **acetabulum of hip bone** to form the **hip joint**.
- Articulates below with **tibia and patella** to form the **knee joint**. (The Fibula have no part in Knee joint)

- ❖ In thigh region 1 bone
- ❖ In leg region 2 bones
- ❖ In foot region 26 bones
- ❖ (Long bone) Any bone has two ends and a shaft
- ❖ The only short bones are: Carpals and Tarsals
- ❖ (Sesamoid) a bone within the tendon of a muscle

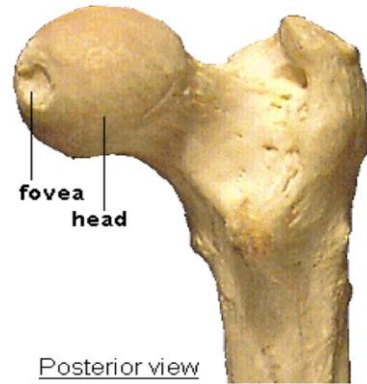
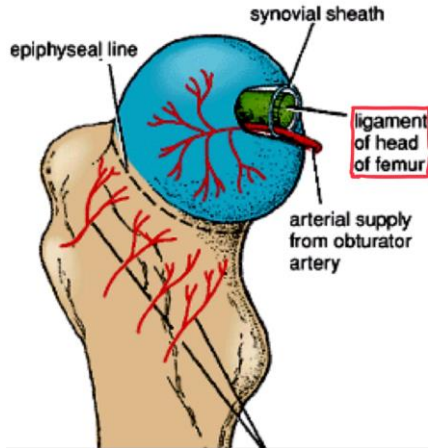
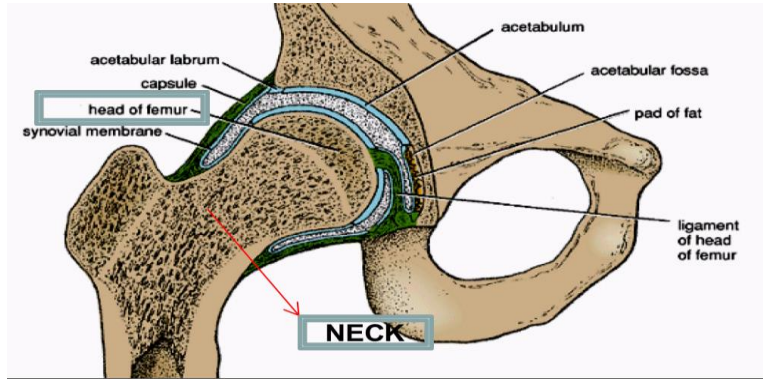
# Bones of Thigh (Femur and Patella)

## Femur

- ❖ consists of :
  - Upper end
  - Shaft
  - Lower end



# Upper End Of The Femur



## 1.Head:

-It articulates with acetabulum of hip bone to form hip joint.

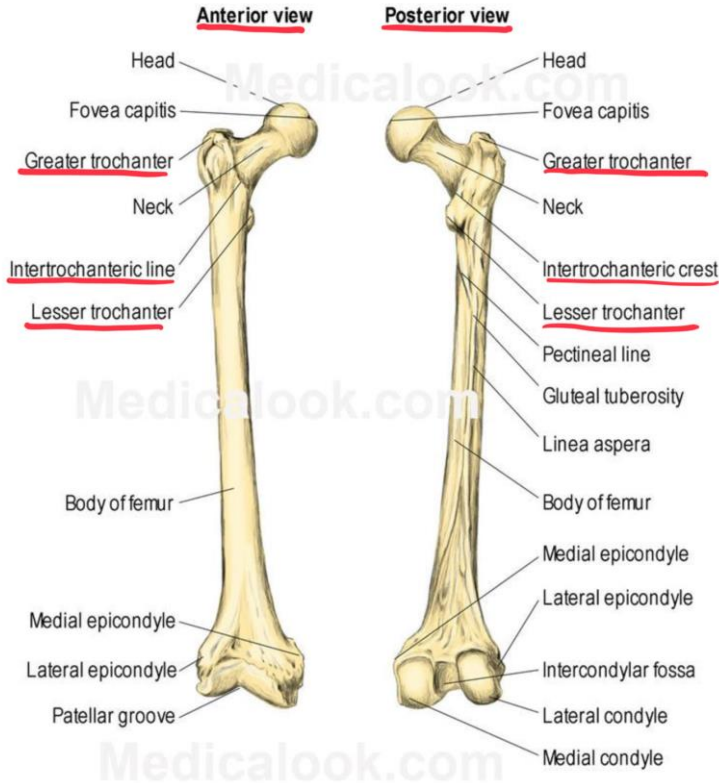
-Has a depression in the center (Fovea capitis) for the attachment of ligament of the head of femur.

-Obturator artery passes along this ligament to supply head of femur

## 2.Neck:

-It connects the head to the shaft

# Upper End Of The Femur



## Greater & lesser trochanters :

### 1. Anteriorly:

-The 2 trochanters are connected by the inter-trochanteric line, where the iliofemoral ligament is attached.

### 2. Posteriorly:

-The inter-trochanteric crest, on which is the quadrate tubercle (Quadratus femoris muscle).

Quadrate tubercle is the insertion point of the Quadratus femoris muscle

# Shaft Of The Femur



It has 3 **surfaces**:

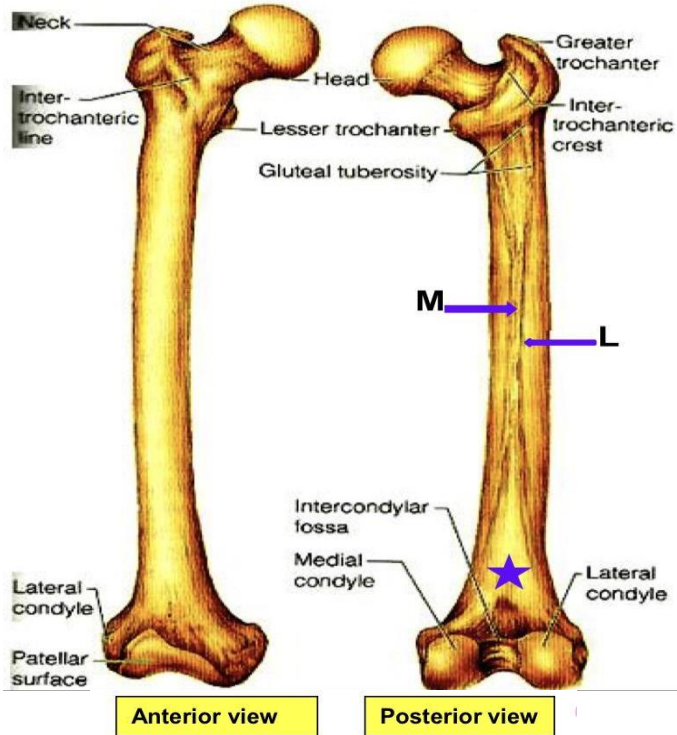
- 1- Anterior (smooth)
- 2- Medial
- 3- Lateral

It has 3 **borders**:

Two rounded (smooth and convex): medial and lateral

One thick posterior border or ridge called **linea aspera** (related to the posterior part of femur)

# Shaft Of The Femur



1- **Anteriorly**: is smooth and rounded.

2- **Posteriorly**: has a ridge, the **linea aspera**.

3- Posteriorly below the greater trochanter is the **gluteal tuberosity** for attachment of gluteus maximus muscle (which we sit on).

4- The medial margin of the linea aspera **M** continues below as **medial supracondylar ridge**

5- The Lateral margin **L** continues below as the **lateral supracondylar ridge**

6- A triangular area, **the popliteal surface** lies at the lower end of shaft



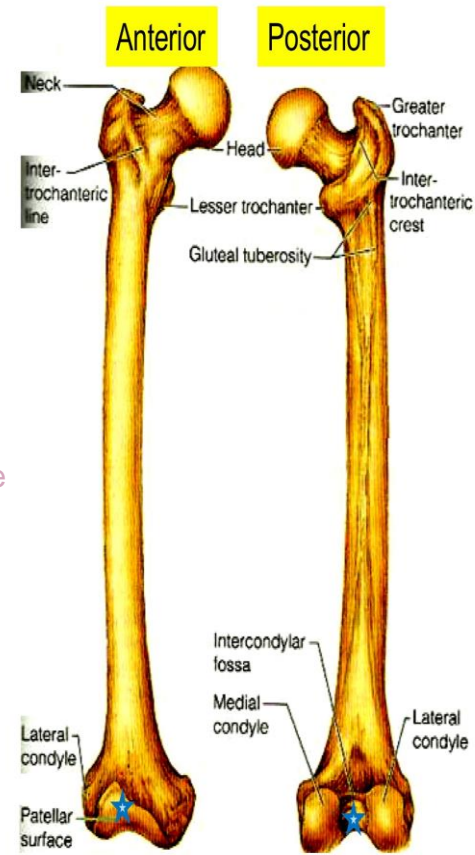
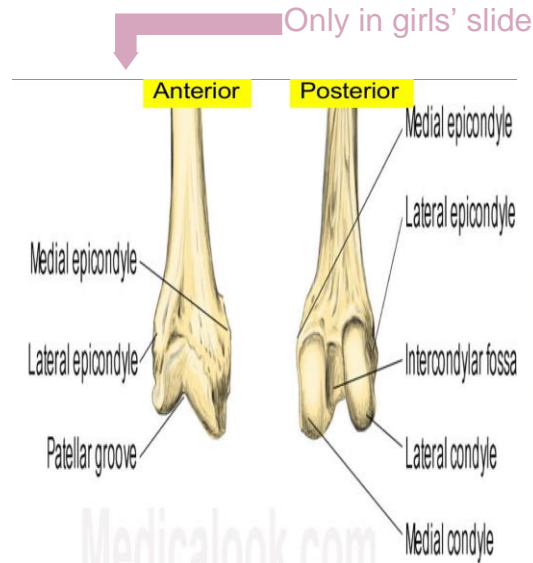


# Lower end of femur

1- Has lateral and medial condyles, separated anteriorly by articular patellar surface, and posteriorly by intercondylar notch or fossa.

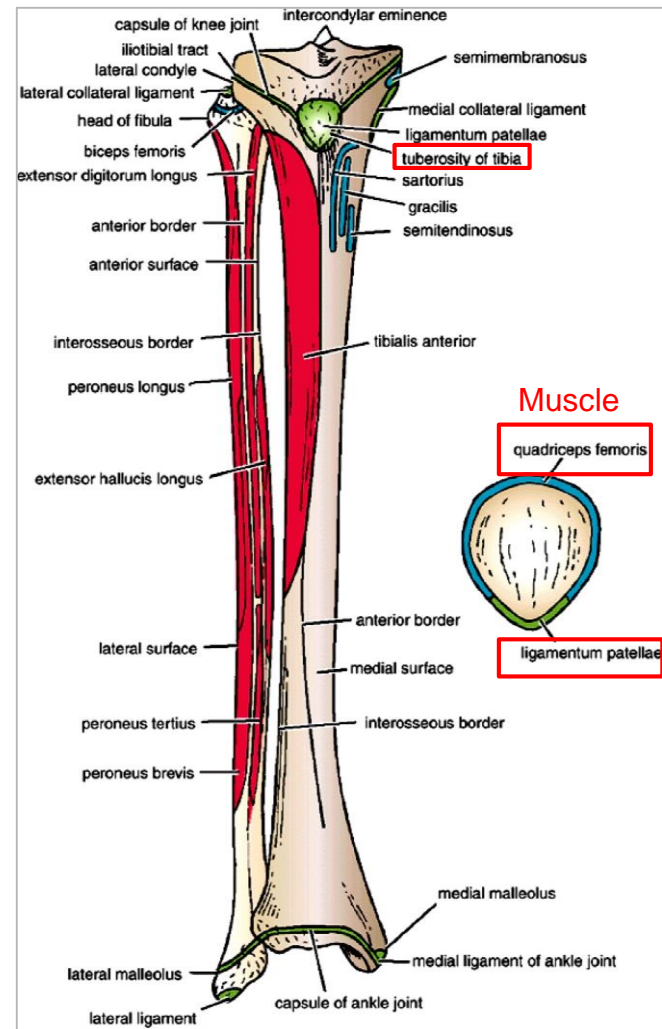
2- The 2 condyles take part in the knee joint. (articulate with the Tibia & Patella)

3 - Above the condyles are the medial & lateral epicondyles. بروزات على العظمه



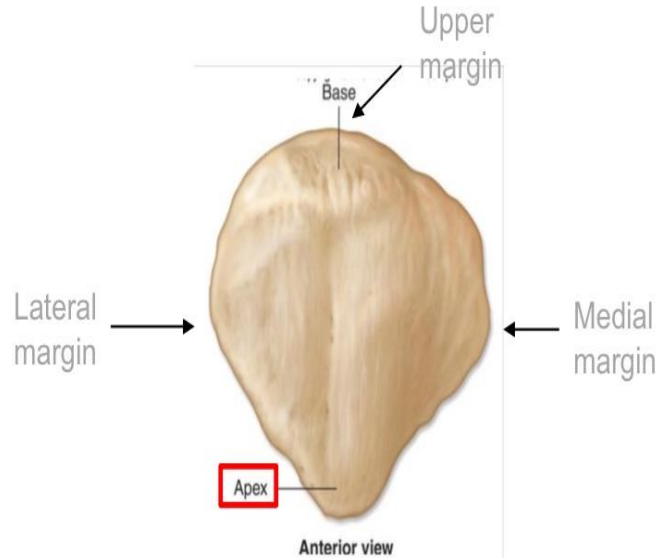
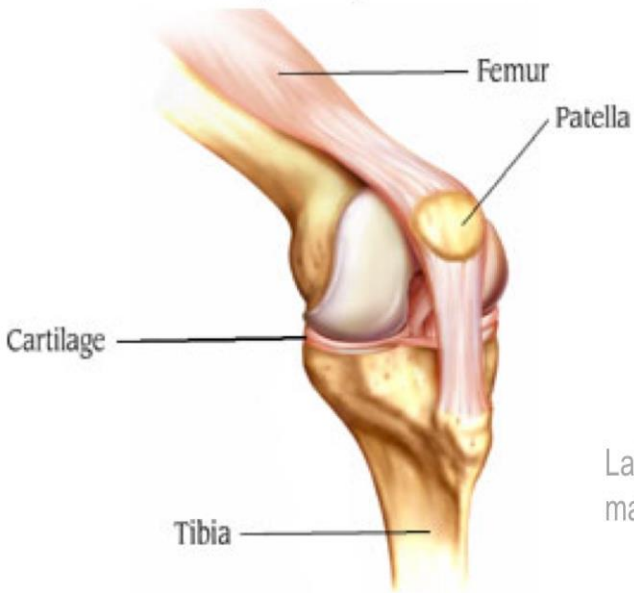
# Patella

- It is the largest sesamoid bone (lying inside the Quadriceps tendon in front of knee joint).
- Its anterior surface is rough and subcutaneous.  
*It is important to know the surfaces of the bones which are subcutaneous ( In the next slides)They might ask you " which one of these is 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.

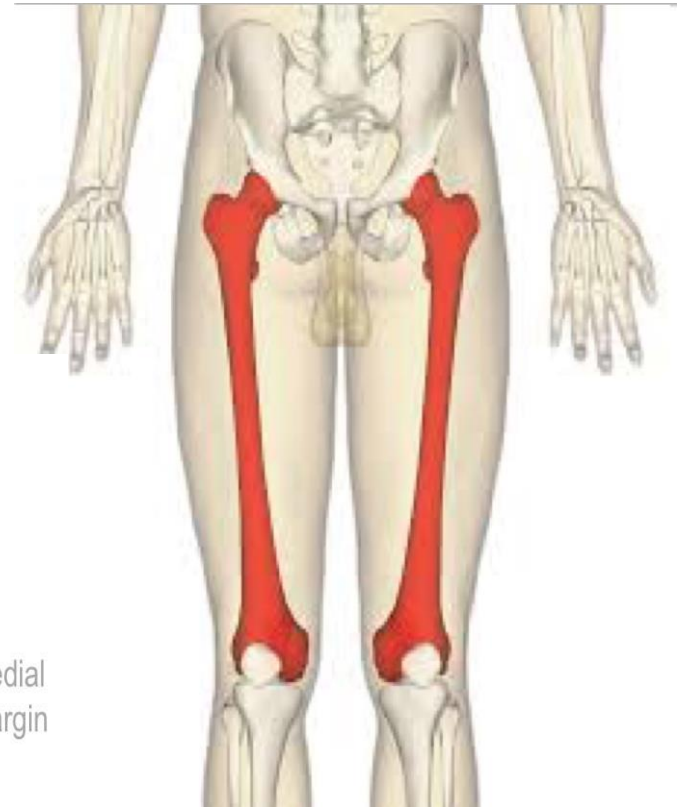


# Patella and Femur

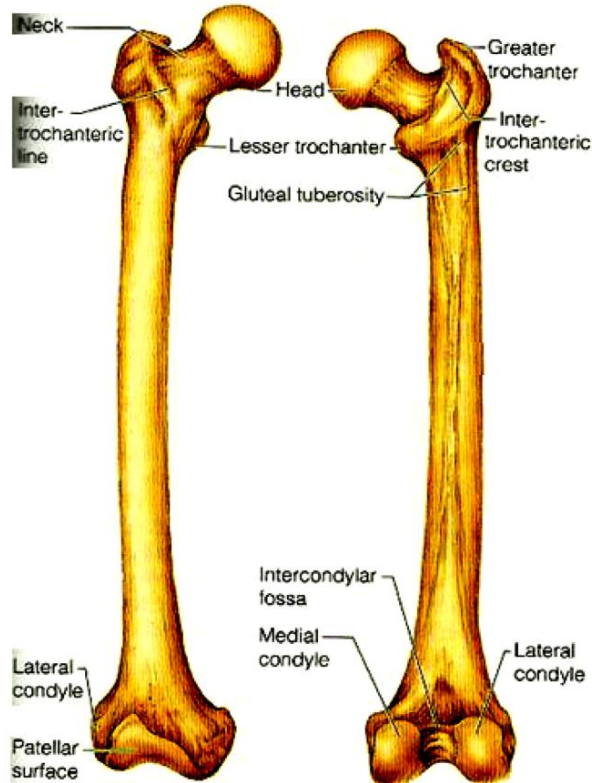
Healthy knee joint surfaces



From team 436



# Position Of Femur (Right or Left)



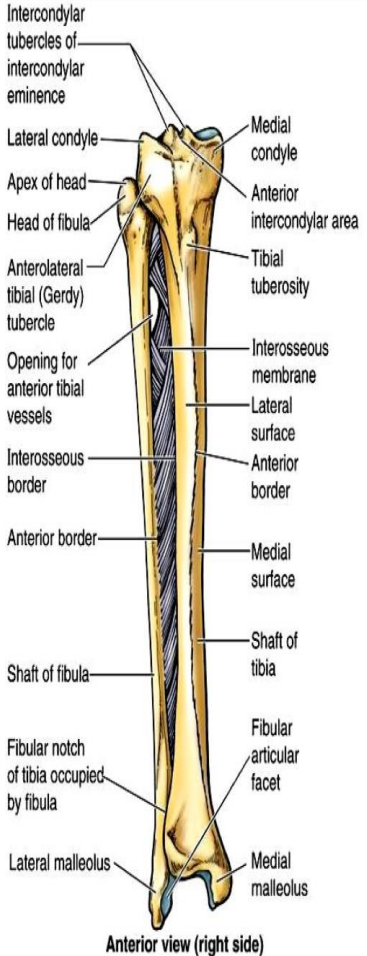
- **Head** is directed upward & Medially.
- **Shaft** is smooth and convex anteriorly.
- **Shaft** is rough and concave posteriorly.

Explanation:

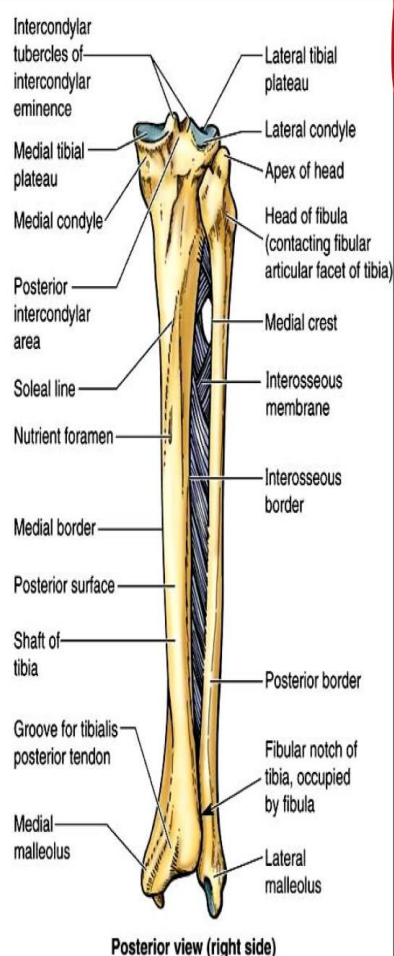
To determine if the femur bone is in the left or right thigh:

1. Make sure that the head is facing upward and is directed medially (towards the center of the body).
2. Rotate the bone until the smooth convex side of the shaft is facing anteriorly, and the rough concave side is facing posteriorly.

# BONES OF LEG (TIBIA AND FIBULA)



Anterior view (right side)



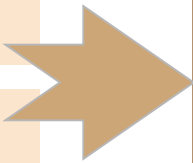
Posterior view (right side)

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.

لسهولة الحفظ  
Lateral ( فيها اثنين L )  
Fibula ( فيها L )  
Tibia > L ما فيها  
Lateral هي Fibula تكون -فالأولى

# TIBIA

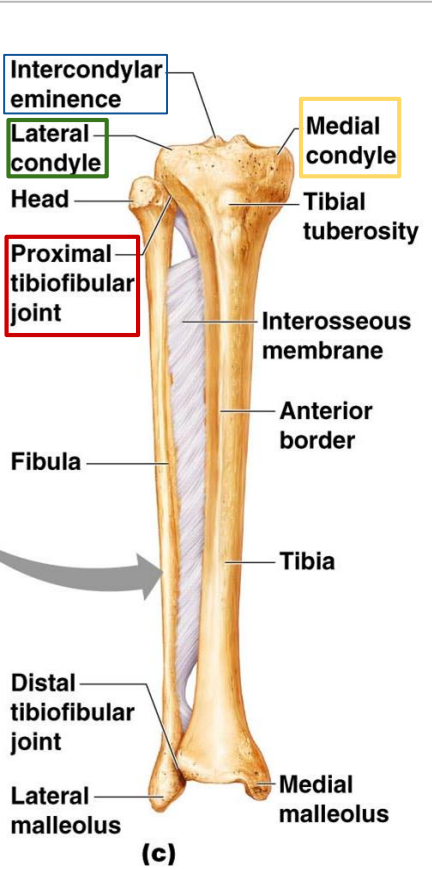
Upper end of tibia

**B**-intercondylar area:

Contains:

- -rough
- -has **intercondylar eminence**

**A**-(2)tibial condyles



condyle	size	Articulates with	other
<b>Medial condyle</b>	larger	Medial condyle with femur	Has a groove on its posterior surface for <b>semi-membranosus muscle</b> .
<b>Lateral condyle</b>	smaller	Lateral condyle of femur	has facet (small oval or circular area) on its lateral side for articulation with head of fibula to form <b>proximal tibio-fibular joint</b>



# TIBIA

## Shaft of tibia

### A-tibial tuberosity

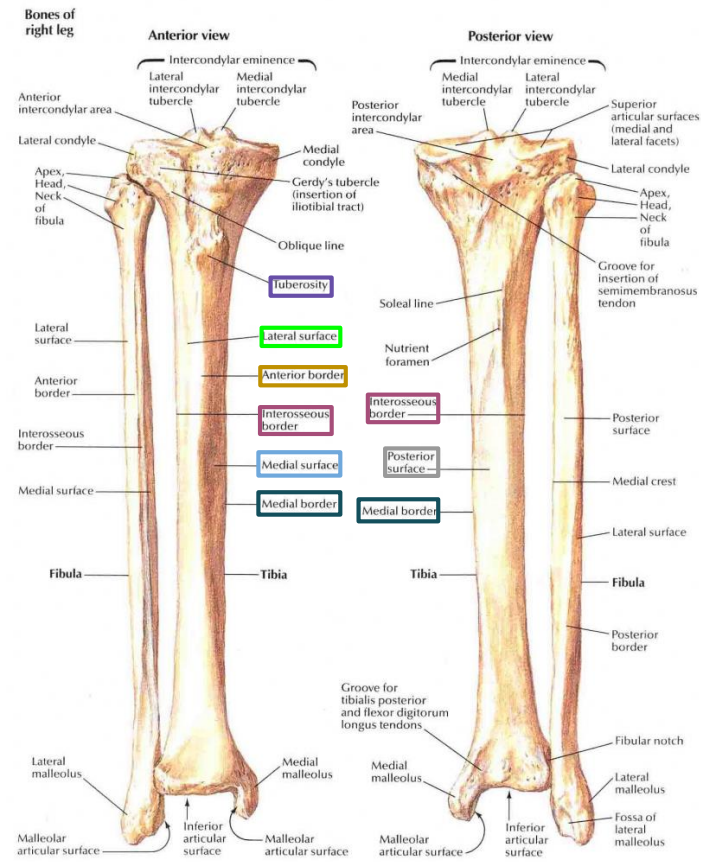
- its upper smooth part gives attachment to **ligamentum patellae**
- its lower rough part is **subcutaneous**

### B-3 borders

- **Anterior border** sharp and **subcutaneous**
- **Medial border**
- **Lateral border** or interosseous border

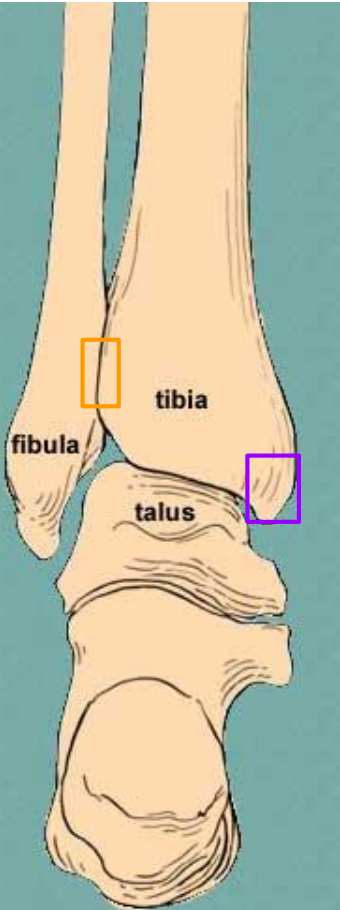
### C-3 surfaces

- **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**.
- the lower end contain:

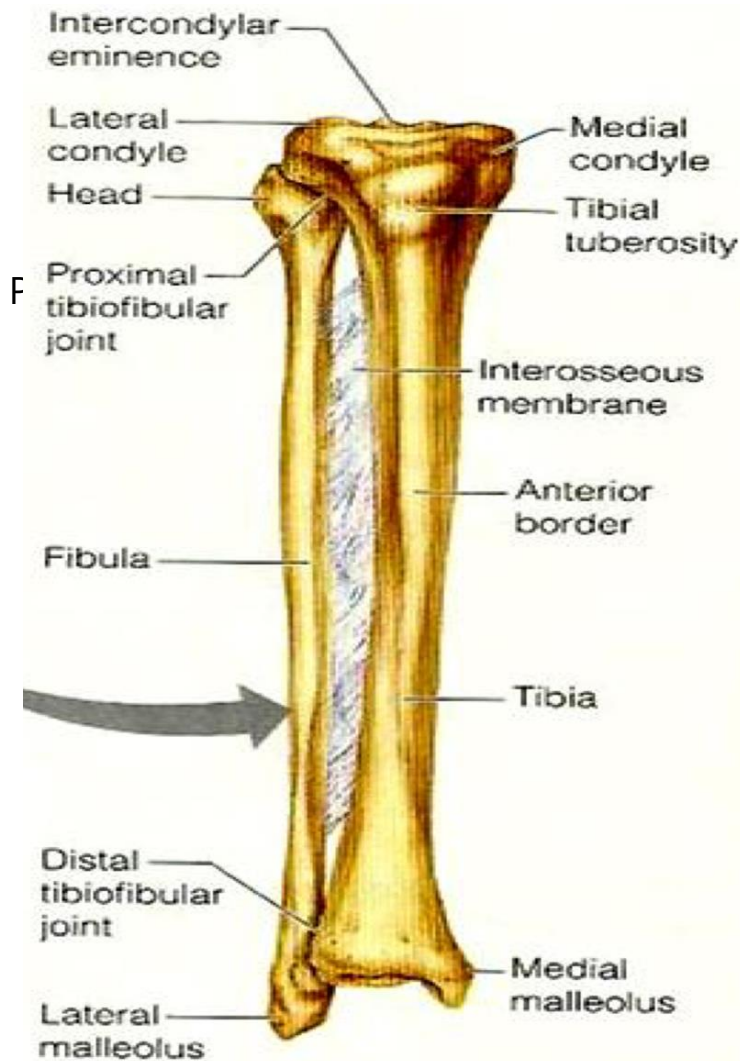
### A- Medial malleolus

- its medial surface is **subcutaneous**
- its lateral surface articulate with talus

### B- Fibular notch

- lies on its lateral surface of lower end to form **distal tibiofibular joint**





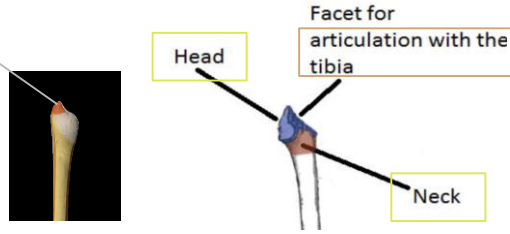
# Position of Tibia (Right or Left)

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

# Fibula

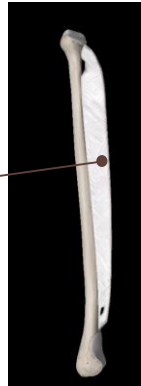
## Upper end :

- 1- **head**: articulates with the lateral condyle of tibia (to form tibiofibular joint)
- 2- **styloid process**
- 3- **neck**



## Shaft:

- 1- **4 borders** : its medial interosseous border gives attachment to **interosseous membrane**.
- 2- **4 surfaces**



\*interosseous membrane is a broad and thin plane of fibrous tissue that separates many of the bones of the body. In this case it separates the tibia and the fibula.

pictures above are extra , but important for better understanding

## Fibula

### Upper end:

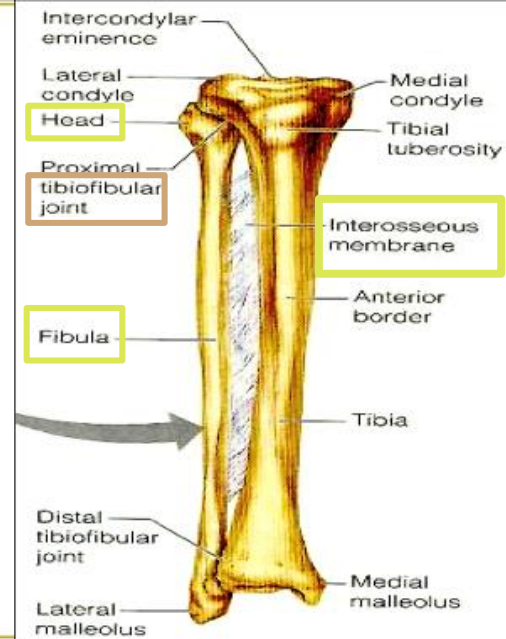
- fibular head
- neck of fibula

### Shaft:

- interosseous border

### Lower end:

- lateral malleolus



- 1- It is the slender **lateral** bone of the leg.
- 2- It takes **no part** in articulation of **knee joint**.
- 3- it gives support for muscles

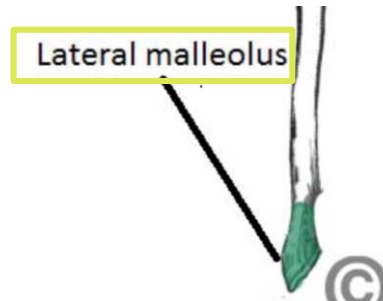
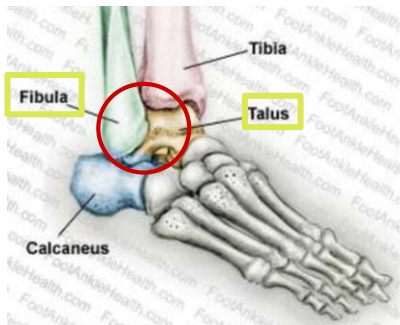
# Fibula

## Lower end:

Forms the

**Lateral malleolus**: which is

- **subcutaneous** “can be felt under the skin”.
- The medial surface of the lateral malleolus is smooth for articulation with talus to form the **ankle joint**.



pictures above are extra , but are important for better understanding

## Fibula

### Upper end:

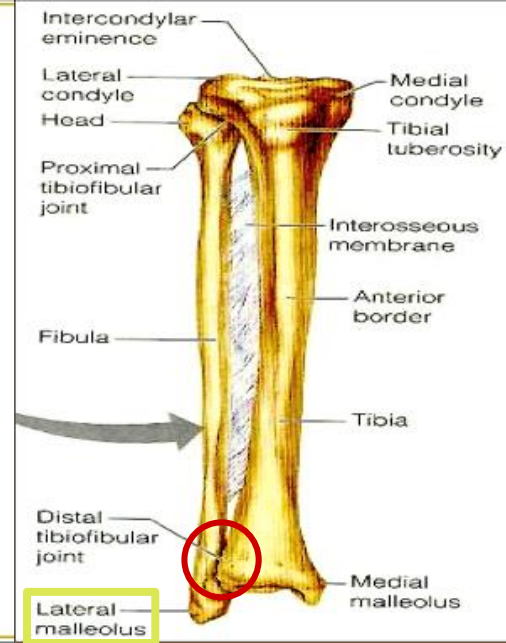
- fibular head
- neck of fibula

### Shaft:

- interosseous border

### Lower end:

- lateral malleolus



### Notes “team 436” :

- Both the femur and the tibia have 3 borders, but the fibula has 4 borders
- For each leg there are two malleolus, a medial one coming from the tibia, and a lateral one coming from the fibula

## *Comparing the long bones*

	Femur	Tibia	Fibula
Articulates	1- with acetabulum to form hip joint. 2- with tibia to form knee joint.	1- with femur to form knee joint. 2- with fibula to form proximal and distal tibiofibular joint 3- with talus to form ankle joint	1- with tibia to form proximal and distal tibiofibular joint. 2- with talus to form ankle joint.
Surfaces	3 (medial, lateral, anterior)	3 (medial, lateral, posterior)	4
Borders	3 (medial, lateral, posterior)	3 (medial, lateral, anterior)	4 (interosseous)

# Bones of foot

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

1. Calcaneus.
2. Talus .
3. Navicular.
4. Cuboid.
5. 3 cuneiform bones (Medial,Intermediate,Lateral).

- Only Talus articulates with tibia & fibula at ankle joint.

- Calcaneus: the largest bone of foot, forming the heel.



To help you memorize the tarsals:

The Circus Needs More Interesting Little Clowns.

# Bones of foot

5 Metatarsal bones: (long bones)

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

14 phalanges: (long bones)

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

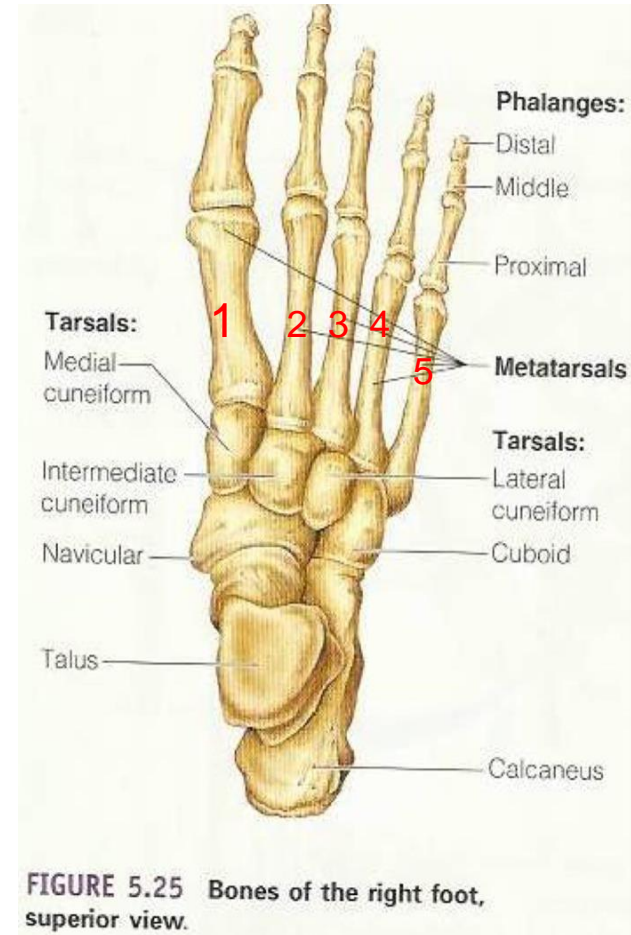


FIGURE 5.25 Bones of the right foot, superior view.

# Question

- 1) The head of the femur articulates with .... To form the hip joint.
  - a) Patella
  - b) Tibia
  - c) Talus
  - d) Acetabulum
- 2) Artery that supplies head of femur?
  - a) Radial
  - b) Obturator
  - c) Axillary
- 3) All of the following are surfaces on the shaft of the femur except?
  - a) Anterior
  - b) Medial
  - c) Lateral
  - d) Posterior
- 4) Talus articulates with ... to form ankle joint.
  - a) Proximal end of tibia
  - b) Distal end of tibia and fibula
  - c) Proximal end of fibula
  - d) Styloid process
- 5) Total number of bones in the foot?
  - a) 26
  - b) 27
  - c) 30
  - d) 25
- 6) which of the following forms the heel?
  - a) Talus
  - b) Calcaneus
  - c) Caracoid
  - d) Cuboid
- 7) direction of tibial malleolus ?
  - a) downward and medial
  - b) Upward and lateral
  - c) Forward and medial

Answers: 1. D 2. B 3. D 4. B  
5. A 6. B 7. A



# Team Members

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Albandari Alshaye  
AlFhadah abdullah alsaleem  
Arwa Alzahrani  
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Dimah Khalid Alaraifi  
Ghada Alhaidari  
Ghada Almuhanha  
Ghaida Alsanad  
Hadeel Awartani  
Haifa Alessa  
Khulood Alwehaibi  
Layan Hassan Alwatban  
Lojain Azizalrahman  
Lujain Tariq AlZaid

Maha Barakah  
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Nouf Alotaibi  
Noura Mohammed Alothaim  
Rahaf Turki Alshammari  
Reham Alhalabi  
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Abdullah Almeaither  
Yazeed Aldossari  
Muath Alhumood

Abdulelah Aldossari  
Abdulrahman Alduhayyim  
Hamdan Aldossari  
Abdullah Alqarni  
Mohammed Alomar  
Abdulrahman Aldawood  
Saud Alghufaily  
Hassan Aloraini

Abdulmajeed Alwardi  
Abdulrahman Alageel  
Rayyan Almousa  
Sultan Alfuhaid  
Ali Alammari  
Fahad alshughaihthy  
Fayez Ghiyath Aldarsouni  
Mohammed Alquwayfili

Abduljabbar Al-yamani  
Sultan Al-nasser  
Majed Aljohani  
Zeyad Al-khenaizan  
Mohammed Nouri  
Abdulaziz Al-drgam  
Fahad Aldhowaihy  
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