

لا تحسبن المجد تمراً أنت آكله ... لن تبلغ المجد حتى تلعق
الصبرا

Musculoskeletal Block
ANATOMY
team 435



COLORCODES

- IMPORTANT NOTES
- EXTRA NOTES
- DEFINITION

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**



Important words

من المطلوب عليك كجزء من دراستك للمادة أن تستطيع أن تصف موقع العظمة و أهم تضاريسها و هذه معاني لأهم الكلمات التي تساعدك في الوصف:

Superior: near to head. في الجزء العلوي من العظمة

Inferior: away from head. في الجزء السفلي من العظمة

(فوق و تحت)

Anterior: near to front. في الجزء الأمامي من العظمة

Posterior: near to back. في الجزء الخلفي من العظمة

(قدام و ورا)

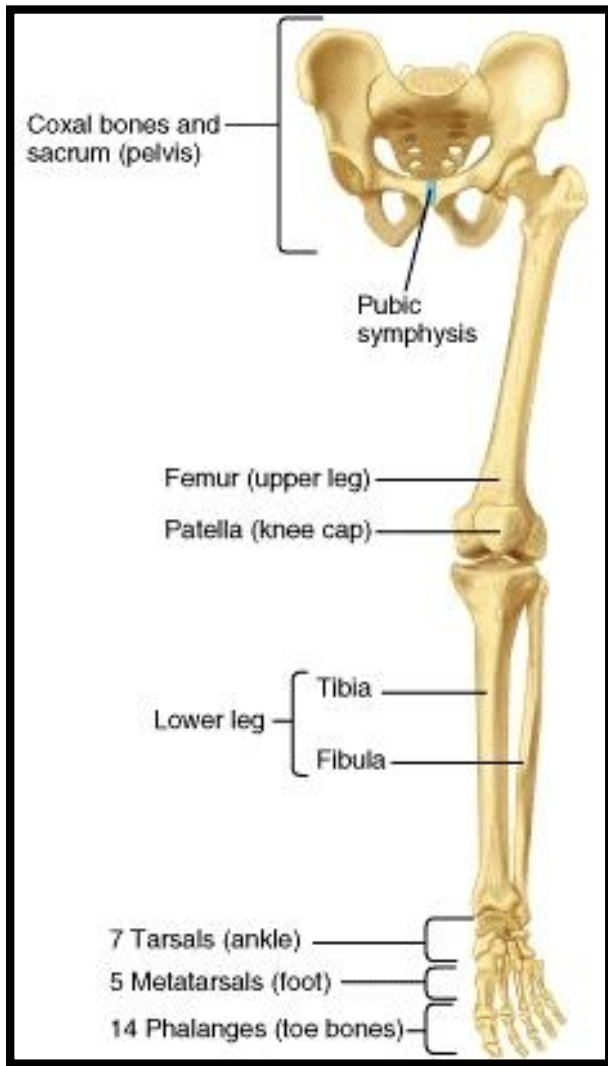
Medial: near to median plane. في الجزء القريب من الجسم في العظمة

Lateral: away from median. في الجزء البعيد من الجسم في العظمة



BONES OF THIGH

(Femur and Patella)



Femur:

- Articulates above with **acetabulum** (تجويف في عظم الورك) of hip bone to form the **hip joint**
- Articulates below with **tibia** and **patella** to form the **knee joint**

Knee joint consists of 3 bones: **femur, tibia, and patella.**



BONES OF THIGH

(Femur and Patella)

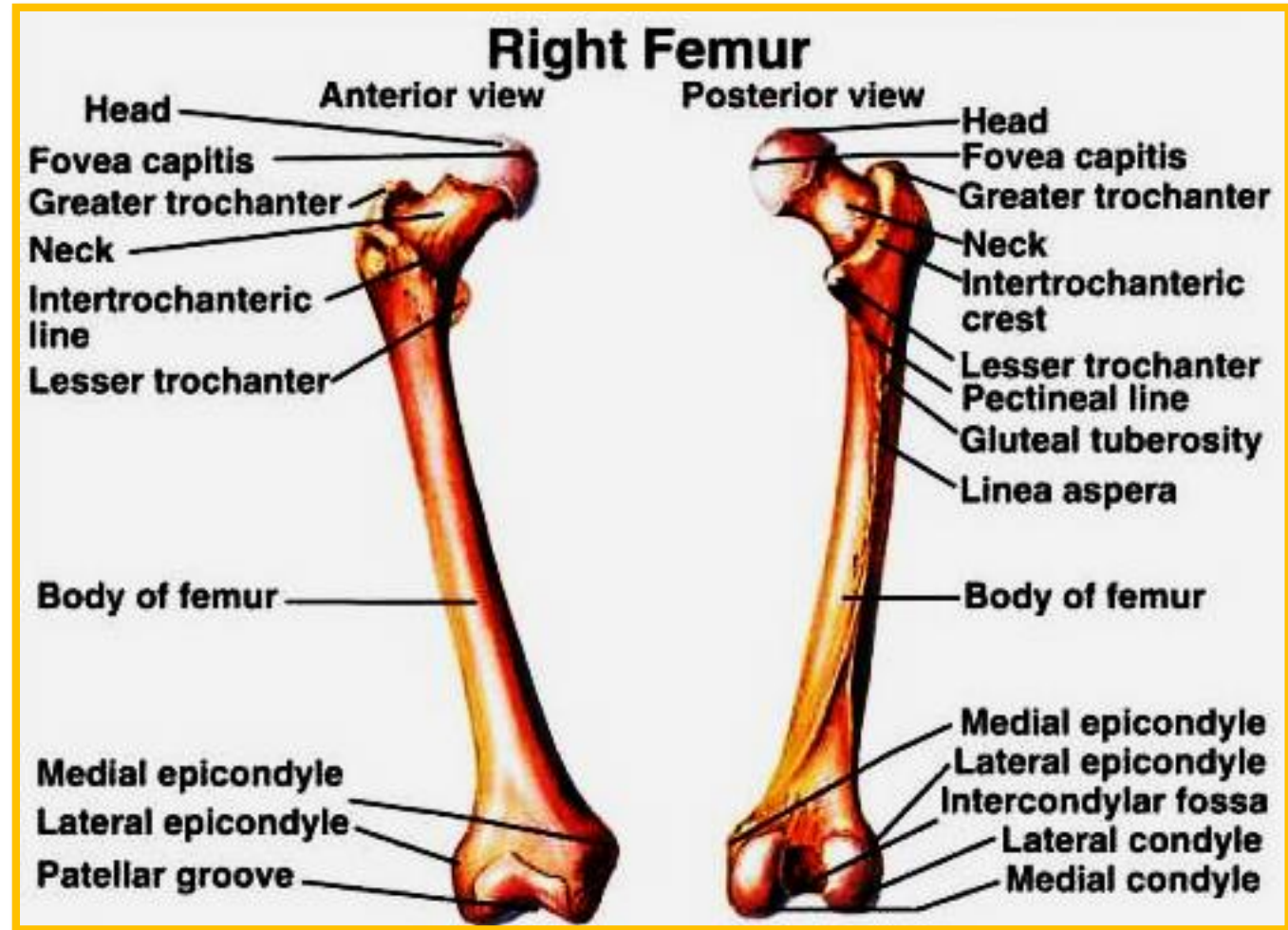
Femur

Consists of:

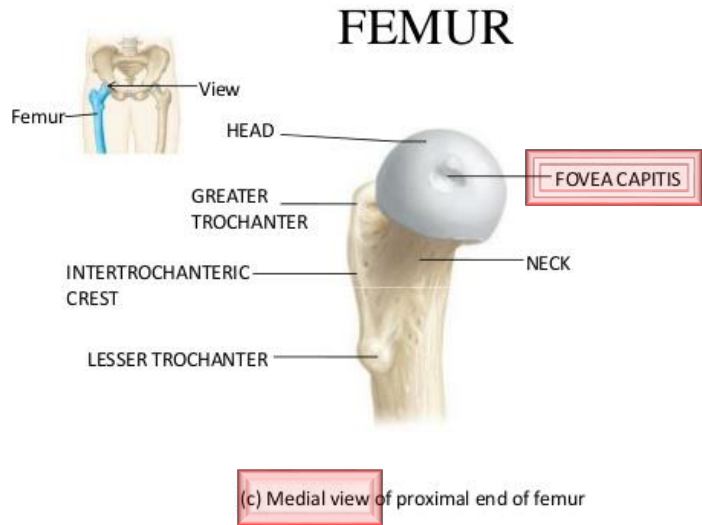
1. Upper end
2. Shaft
3. Lower end

note:

All long bones consist of an upper end, lower end, and a shaft



UPPER END OF FEMUR



4/6/2013

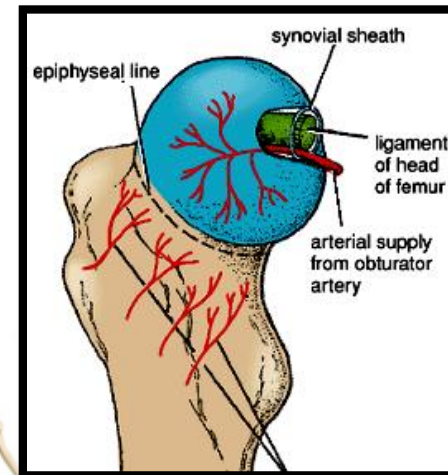
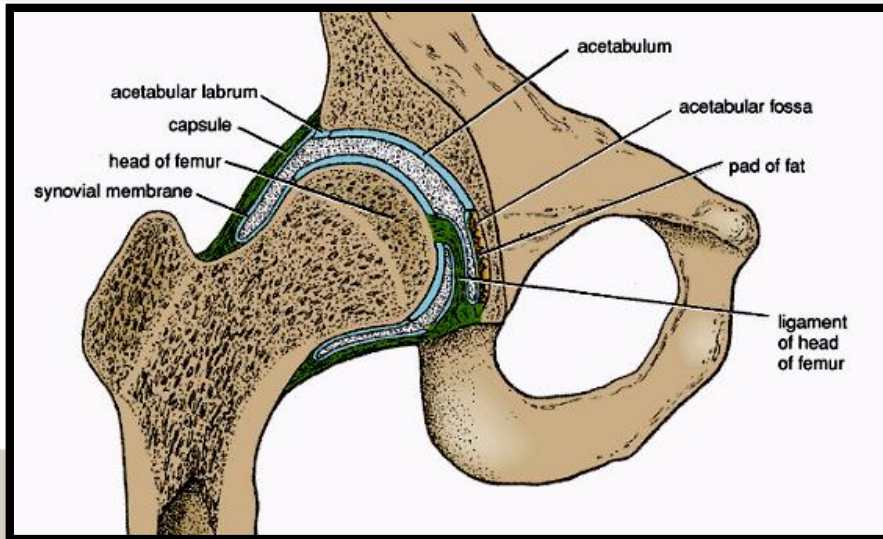
27

■ Head:

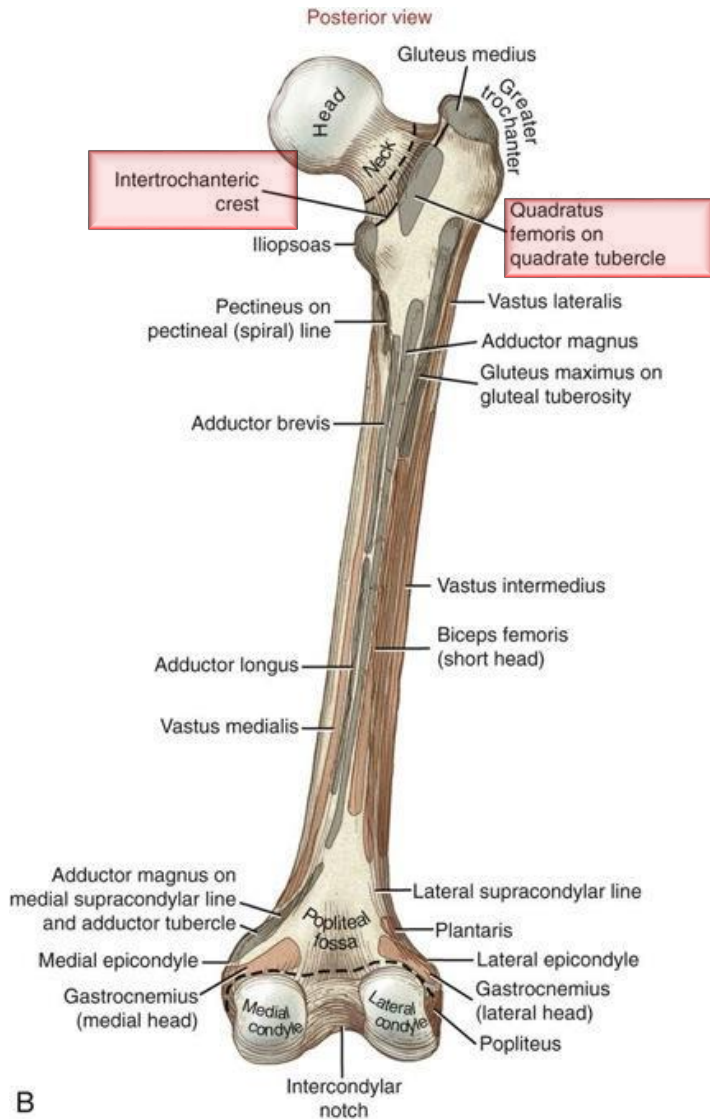
- It articulates with acetabulum of hip bone to form hip joint
- Has a depression (انخفاض) in the center (fovea capitis), for the attachment of ligament of the head
- Obturator artery passes along this ligament to supply head of femur

■ Neck:

- It connects head to the shaft



UPPER END OF FEMUR



B

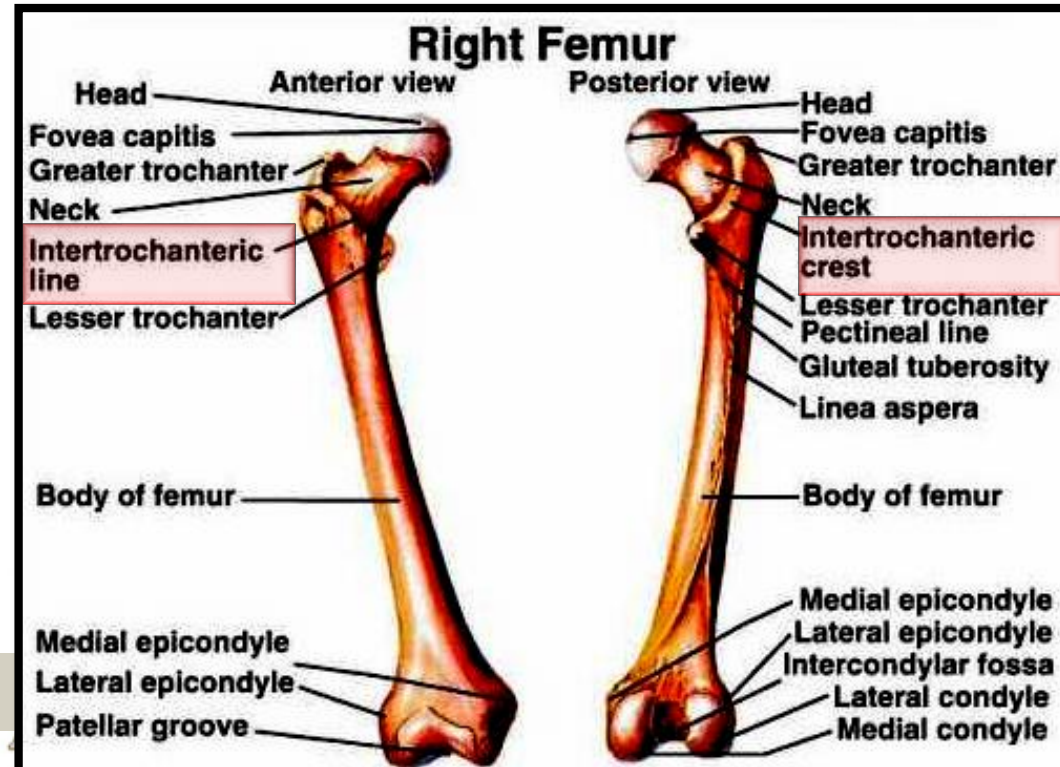
Greater and lesser trochanters

- 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 (Quadratus femoris muscle)**



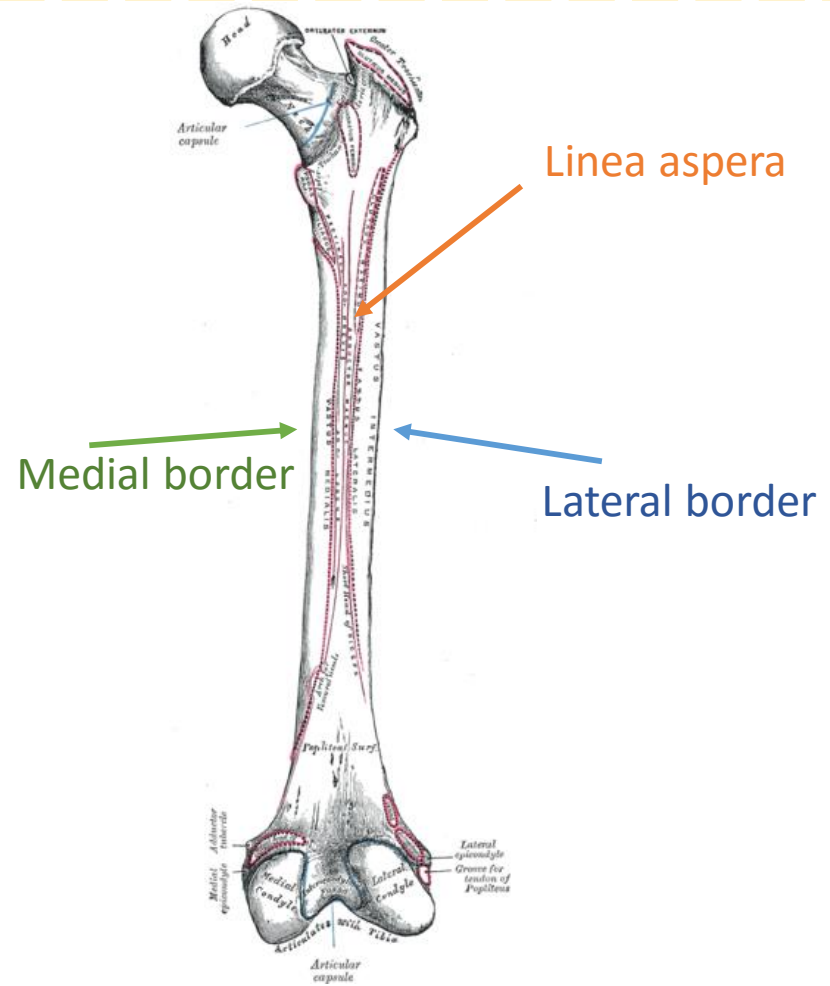
SHAFT OF FEMUR

It has 3 borders :

- Two rounded **Medial** and **lateral**
- One thick **posterior** border (or ridge) called **linea aspera**

It has 3 surfaces :

- 1- Anterior
- 2- medial
- 3- lateral



SHAFT OF FEMUR

Posteriorly : below the greater trochanter is **gluteal tuberosity**

(for the attachment of **gluteus maximus muscle**)

Also it has a ridge (**linea aspera**)

Anteriorly : is smooth and rounded.

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

- The lateral margin continues below with the **lateral supracondylar ridge**

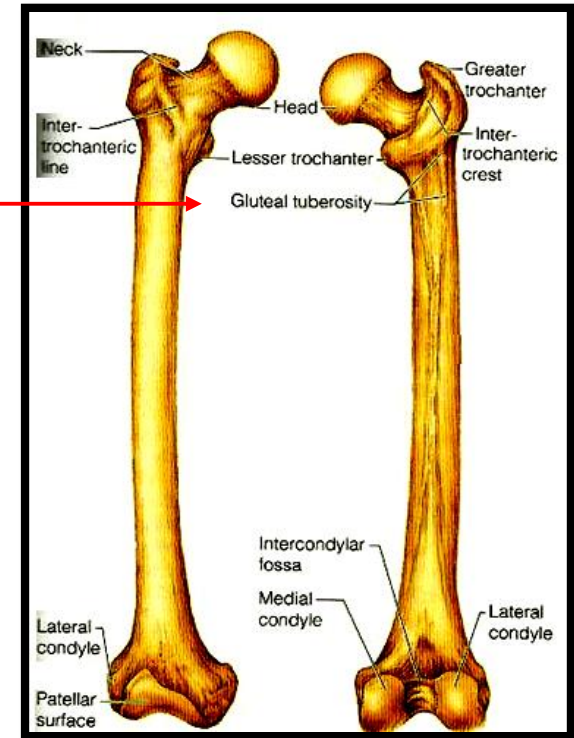
- A Triangular area, the **popliteal surface** lies at the lower end of shaft

المثلث بين الخطين

medial supracondylar ridge

lateral supracondylar ridge

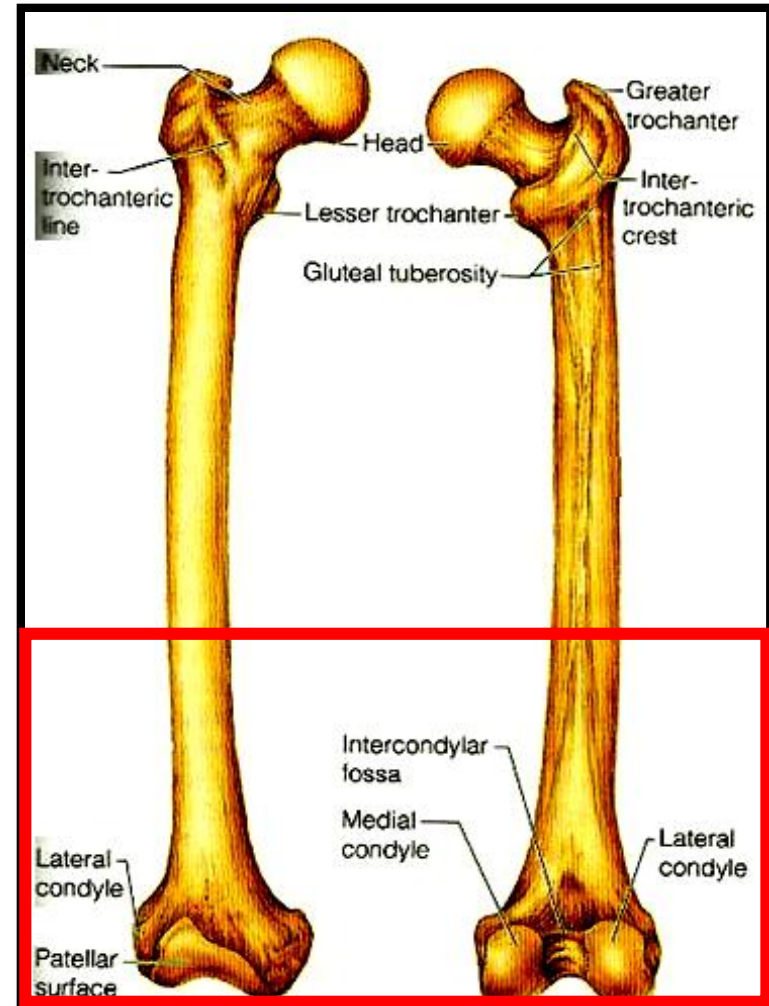
Popliteal surface



LOWER END OF FEMUR & POSITION OF FEMUR (left and right)

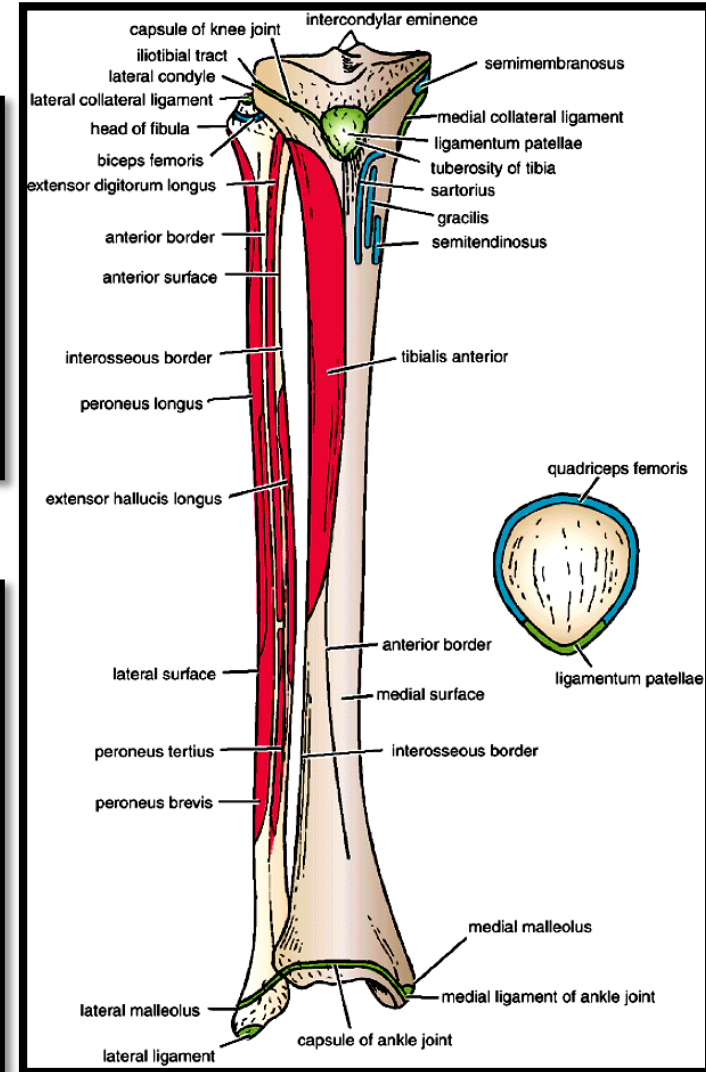
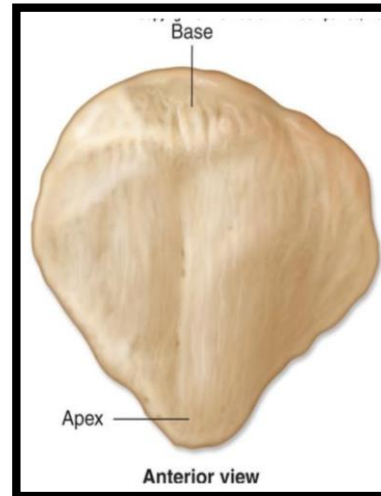
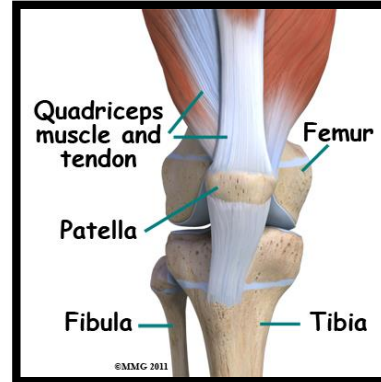
- Has a **lateral** and **medial condyles** Separated **anteriorly** by: **Articular patellar surface** And **posteriorly** by: **Intercondylar notch or fossa**
- The two condyles take part in the **knee joint** .
- Above the condyles are **lateral and medial epicondyles**.

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



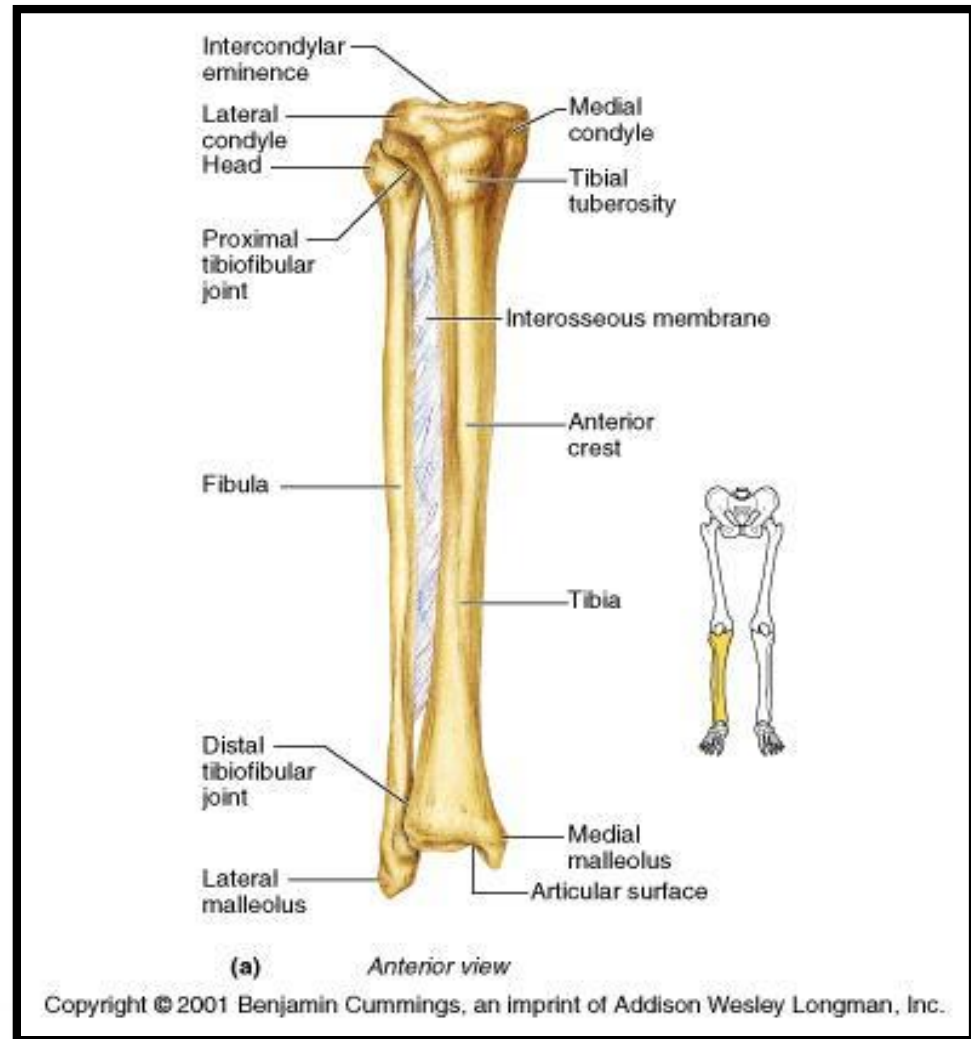
Patella

- **It is the largest sesamoid bone**
- Laying inside the Quadriceps tendon in front of the knee joint
- Its anterior surface is rough and **subcutaneous**
- Its posterior surface articulates with **condyles of the femur** to form the 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** .



Bone of Leg (Tibia & Fibula)

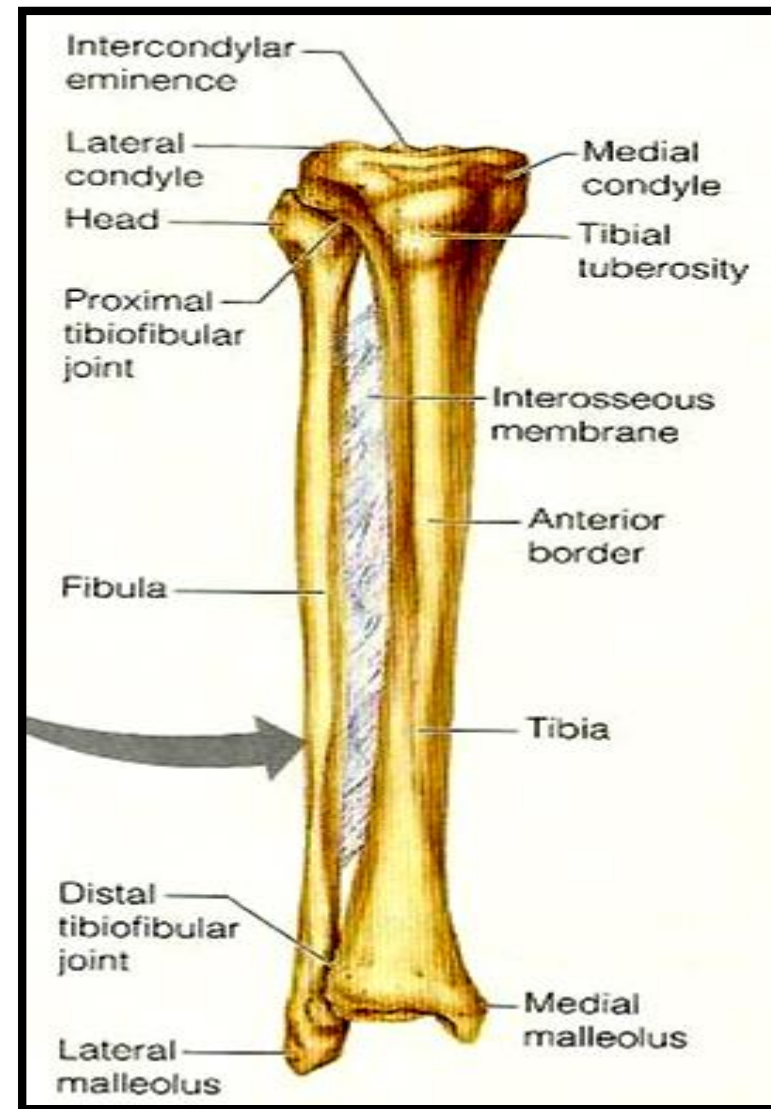
Tibia: medial bone of leg
Fibula: lateral bone of leg
Both have: Upper end,
Shaft, Lower end



1-Upper End: Which has

A-Two tibial condyles:

Condyles:	Size	articulates with:	Other
Medial	Larger	medial condyle of femur	It has a groove on its posterior surface for semimembranosus muscle
Lateral	Smaller	lateral condyle of femur	It has facet on its lateral side for articulation with head of fibula to form proximal tibio-fibular joint



B-Intercondylar area: it's rough and has the **intercondylar eminence**



2-Shaft: Which includes

تحت الجلد

- **A- Three borders:**

- 1-**Anterior border:** is sharp and subcutaneous
- 2-**Medial border**
- 3-**Lateral border:** also called interosseous border.

- **B-Three surfaces:**

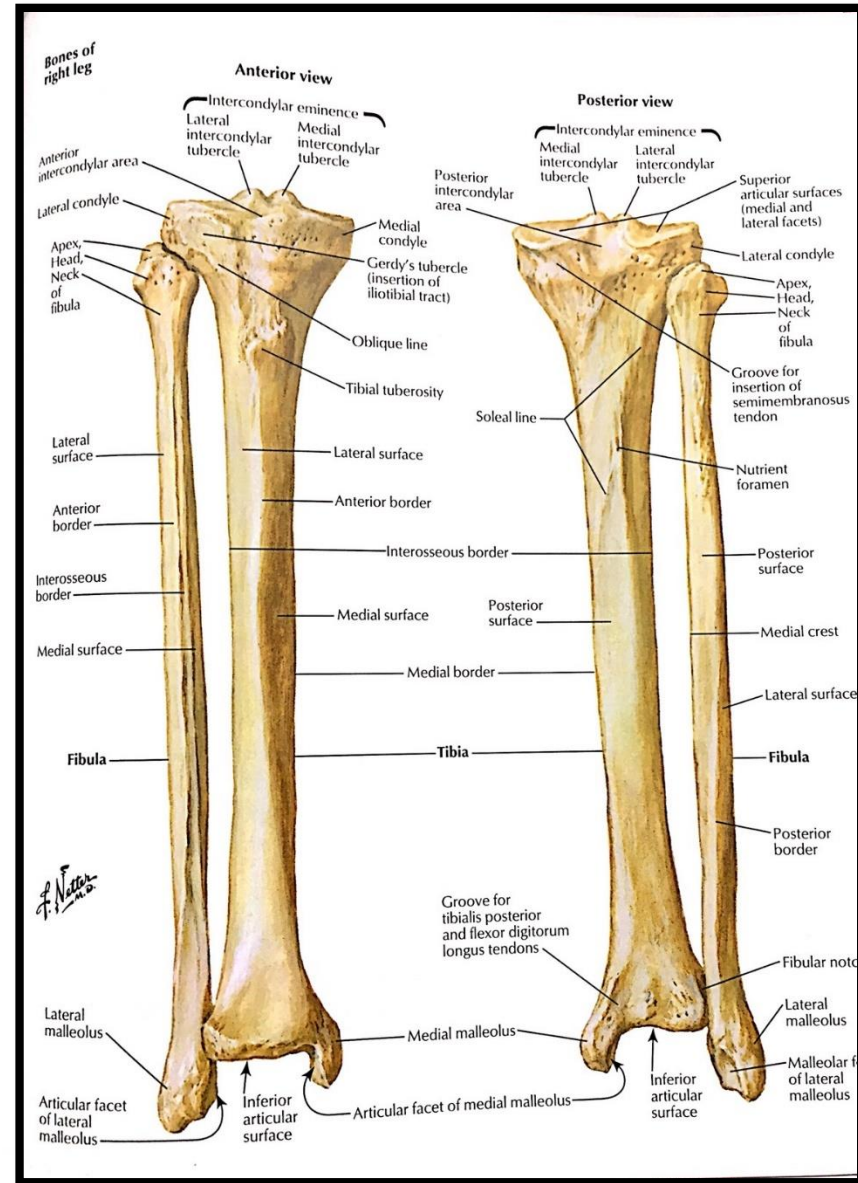
- 1-**Medial:** subcutaneous.
- 2-**Lateral**
- 3-**Posterior:** has oblique line, **soleal** line for attachment of **soleus muscle**

- **C- Tibial tuberosity:**

1-Upper smooth part: gives attachment to ligamentous

Patellae

2-lower rough part: is subcutaneous

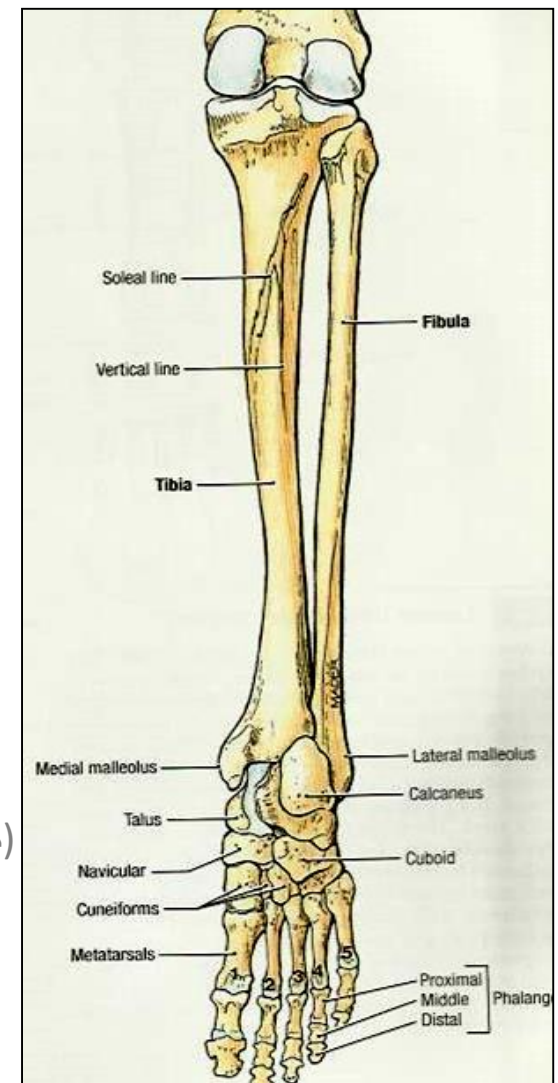


3-Lower End:

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

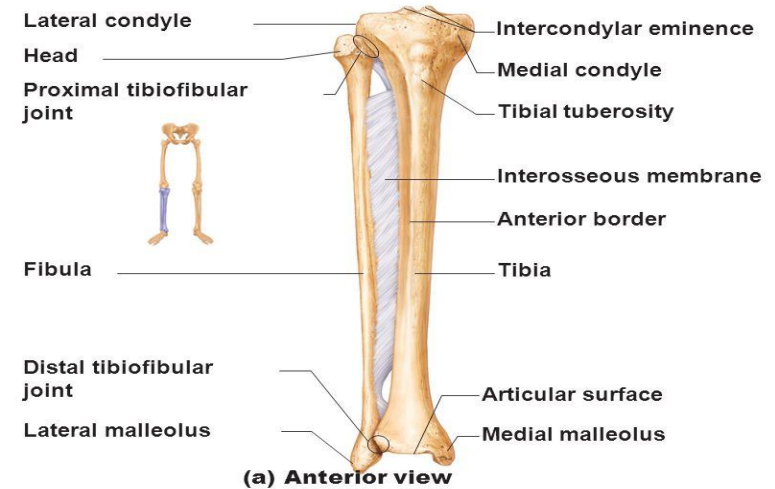
Position of Tibia (from right to left):

- **Upper end** is **larger** than the **lower end**
- **Medial malleolus** is directed **downward and medially** (متجه تحت و للمنتصف)
- Shaft has a **sharp anterior border**



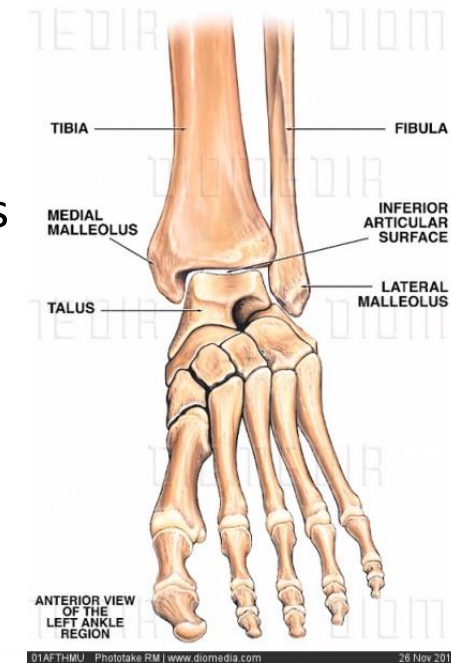
Fibula

- It is the slender lateral (نحيف) 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



(a) Anterior view

Figure 7.32a



ANTERIOR VIEW OF THE LEFT ANKLE REGION

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26 Nov 2015

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KEN HUB



• Shaft :

-It has 4 borders and 4 surfaces

-Medial shaft has interosseous border which is attached to **interosseous membrane**.

Lower end:

-It has **lateral malleolus** which is subcutaneous*.

-It's medial surface is smooth for articulation with **talus** to form ankle joint



Bones of the foot

Articulates with tibia and fibula at ankle joint

Largest bone of the foot and forms the heel

calcaneus (heel bone)

talus (anklebone)

Tarsal bones (7):
Starts to ossify **before birth** and end **ossification by 5th year.**

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

transverse tarsal joint

navicular bone

cuboid

lateral cuneiform bone

tarsometatarsal joint

intermediate cuneiform bone

medial cuneiform bone

metatarsal bones

Metatarsal bones (5):

- Numbered from medial (big toe) to lateral.
- First one is large and lies medially
- Each metatarsal bone has base (proximal) a shaft and a head (distal)

Phalanges (14):

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

phalanges (toe bones)

proximal phalanges

middle phalanges

distal phalanges

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Summary

Skeleton of lower limb consists of:

- **Femur** : bone of the thigh
- **Tibia** : medial bone of the leg
- **Fibula** : lateral bone of the leg
- **Bones of the foot (26)** :
 1. Tarsal bones (7), calcaneum is the largest bone forming the bone.
 2. Metatarsal bones (5)
 3. Phalanges (14)

Subcutaneous parts of lower limb bones:

- Patella.
- Anterior border of tibia.
- Tibial tuberosity.
- Medial malleolus of tibia.
- Lateral malleolus of fibula.



Thigh

BONES OF LOWER LIMB

Foot

14 phalanges

5 metatarsals

7 tarsals

Patella

- Posterior part (knee joint)
- Largest sesamoid bone
- Upper, lateral, and medial margins (Quadriceps)

Leg

Tibia

- **Upper end :**
 1. Lateral condyle
 2. Medial condyle
 3. Intercondylar area
- **Shaft:**
 1. **Borders:** medial, lateral, and **anterior**
 2. **Surfaces:** medial, lateral, and **posterior.**
- **Lower end + talus** (ankle joint)

Fibula

- **Upper end** (head, neck, and styloid process)
- **Shaft** has 4 surfaces and 4 borders.
- **Lower end + talus** (ankle joint)

Femur

- Upper end (head and neck)
- Shaft:
 1. **Borders:** medial, lateral, **posterior.**
 2. **Surfaces:** medial, lateral, **anterior.**
- Lower end: medial and lateral condyles (Knee joint)

Mind Map
For revision



**Video: Tibia and Fibula:
Skeletal Anatomy**

<https://youtu.be/8Y4WZxDnEEM>

**Video: The Femur: Skeletal
Anatomy**

<https://www.youtube.com/watch?v=oi0cOvuhsa8>



**Application : Sobotta
anatomy atlas
on app store**

**Application: Essential anatomy 5
you can have it for free, ask**

https://twitter.com/Med_435



Quiz:

Lower Limb part.1 (15 questions)

<https://www.onlineexambuilder.com/lower-limb/exam-47746>

Lower Limb part.2 (6 questions)

<https://www.onlineexambuilder.com/lower-limb-part.2/exam-47750>

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