
# ANATOMY TEAM

## LECTURE (1)

## LOWER LIMB

# 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).**

- **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 Lower limb

# Anatomy Team 432

تنويه : هذا الملف لا يعتبر مرجع أساسي للمذاكره وانما هو للمراجعه فقط ، المرجع الاساسي هو السلايد ولا يوجد أي اختلاف بين سلايد الاولاد والبنات.

## Some important notes:

- **Bones of the lower limb can be generally memorized though this mnemonic:**

  "Help Five Police To Find Ten Missing Prisoners"

  (Hip, Femur, Patella, Tibia, Fibula, Tarsals, Metatarsals, Phalanges)
- **Phalanges are type of long bone.**
- **Classification of bone is according to the shape,ossification, structure and development of the bone. There is no classification according to the length of the bone.**
- **Long bone consist of two ends and shaft (body), it may or may not have a medullary cavity.**
- **Femur is the first bone of the lower limb.**
- **Femur articulate below with tibia and patella to form knee joint**
- **Hip bone contain three part that are illium , pubic and ischium.**
- **Head of the femur is always toward medial site.**
- **Obturator artery and ligament of head of femur exist inside of the fovea capitis .**
- **In femur the shaft anteriorly is smooth and rounded. And posteriorly rough .**
- **Note that the lateral surface of the medial malleolus of the tibia articulates with the talus while the medial surface of the lateral malleolus of the fibula articulates with talus, forming the ankle joint.**
- **Sesamoied bone are small bones in our body and they are placed inside tendons**
- **Patella is the largest sesamoid bone (lying inside the Quadriceps tendon in front of knee joint).**
- **Fibula does not take part in knee joint . It makes proximal and distal tibiofibular joint .**

- **Always remember** fibu**LA** is **LA**teral.

**Calcaneum= sound like call-caneum .**

**Talus = sound like tell-us .**

**Navicular = from nave .**

**Cuneiform = similar to uniform ( Q- ni-form)**

**Navicular articulates with talus.**

**While cuboid articulates with calcaneus.**

**Great toe = polus/holus.**

- **The tarsals and carpals are the only short bones in our body .**
- There are 30 short bone in our body , 14 ( tarsal ) bones in the lower limb and 16 ( carpal ) bones in the upper limb.

- You can memorize the tarsal bones using this mnemonic:

The Circus Needs More Interesting Little Clowns.

- **T:** Talus
- **C:** Calcaneus
- **N:** Navicular
- **M:** Medial cuneiform
- **I:** Intermediate cuneiform
- **L:** Lateral cuneiform
- **C:** Cuboid

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Patella → صابونة الركبة

Eminence → يعني نتوء

*anything that articulate is smooth

## Summary is very important part of the lecture:

- **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).

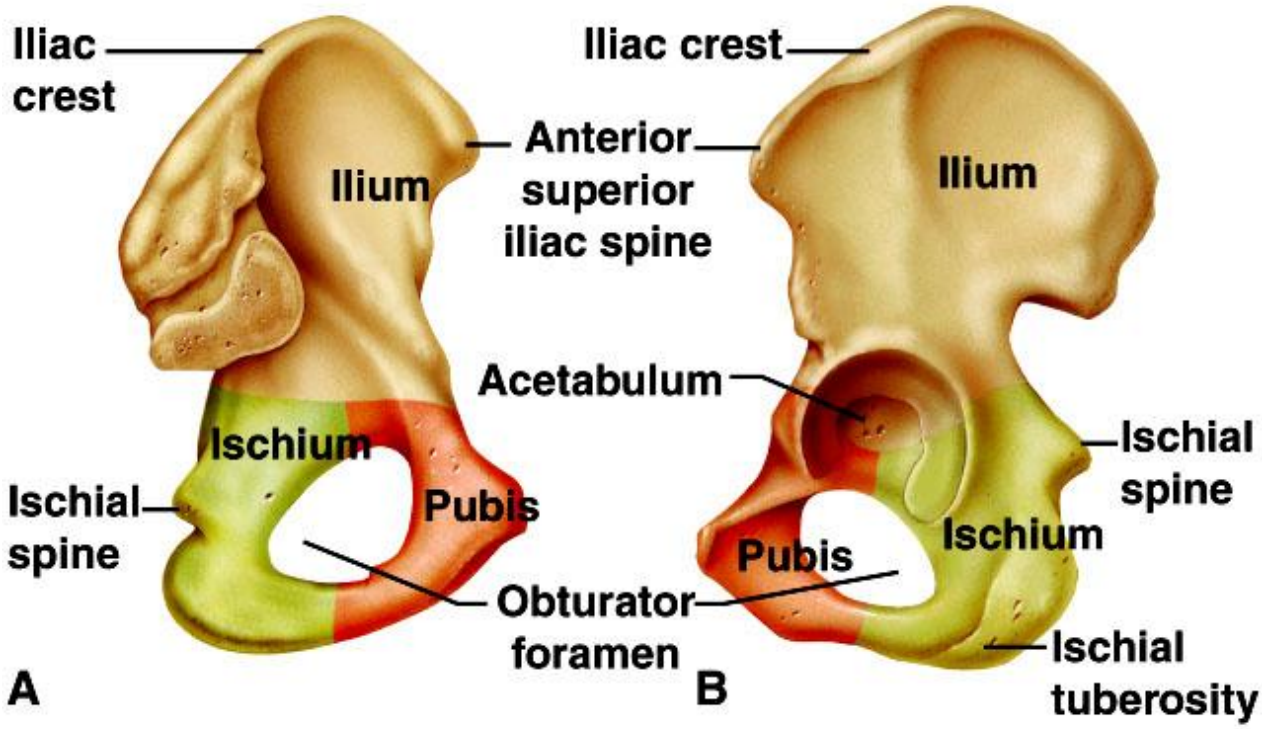
**The subcutaneous parts of bones in the lower limb are:**

- 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.**

## For knowledge:

The three part of hip bone are shown in the figure:





## Quick Review:

**-Which part of the hip bone Articulates "superior" with femur?**

**Femur Articulates above with acetabulum of hip bone to form hip joint**

**-femur consist of :**

**Upper end**

**Shaft (body)**

**Lower end**

- **What is the name of the depression in the center of the head of femur? What is function?**

**Fovea capitis and it is for the attachment of ligament of the head.**

- **What artery passes long ligaments to supply the head of femur?**

  **Obturator artery**

- **Which part of the femur connects head to the shaft?**

  **Neck**

- **What connects the greater and lesser tochanters anteriorly?**

  **The inter-trochanteric line.**

  - **What connects the greater and lesser tochanters posteriorly?**

  **The inter-trochantric crest.**

- **How many surfaces and borders does the shaft of femur have? Mention it?**

  **Three surface (medial, lateral, anterior)**

  **Three border (medial, lateral) → rounded &**

  **( posterior)→ thick or rigid called linea asperea**

- Where is the  gluteal tuberosity located?

- Below the greater trochanter in the posteriorly part of the shaft of femur and it for attachment of gluteus Maximus muscle.

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- What we called the Triangular area in the femur and where it located?
  It is the popliteal surface and it lies at the lower end of shaft.

- Where are the medial, lateral and epicondyles?
  Above the condyles in the lower ends of femur.

- Lateral and medial condyles, separated by what?
  Anteriorlyby articular patellar surfaceand andposteriorlyby intercondylar notch or fossa.

- What is the notch?
  an indentation on an edge or surface

- What is the fossa?
  A hollow place.

- Under which type do we classify patella?
  sesamoid bone.

- Which part of patella articulates with the condyles of the femur to form knee joint?
  Posterior surface.

- Its upper, lateral, and medial margins give attachment to Quadriceps femoris muscles.

- **Which form proximal tibio-fibular joint?**
  **The articulation of the facet on the lateral side of the lateral condyle in upper ends of tibia with the head of fibula.**

- **Which form distal tibio-fibular joint?**
- **Fibular notch in lower end of tibia**
- **Where are Medial and lateral malleolus?**
  **Medial malleolus → Lower end of Tibia**
  **Lateral malleolus → Lower end of Fibula**
- **Upper end in fibula contains?**
- **Head ,Styloid process →" head هو عبارة عن جزء بارز في ال" and neck**

- **What is the largest bone of the foot?**
- **Calcaneum→ forming the heal**

- **Which of bones the lower limb articulate to form the ankle joint?**
  **Talus + Tibia and Fibula.**
- **What is the proximal and distal of metatarsal?**
  **Proximal (base)**
  **Distal (head)**

**How many phalanges do toes have?**
**2 phalanges for big toe (proximal & distal) and 3 phalanges for each of the lateral 4 toes (proximal, middle & distal.**

YouTube :

- **Clear explanation and useful distinguishing features of bones of the lowers limb (material that includes our lecture starts from 1:54)**
  http://www.youtube.com/watch?v=TOaN5jmdOFw
- **Lower Limb Marking quiz (quiz yourself!)**
  http://www.youtube.com/watch?v=g4yGLX6WB68
- **Pictures of the bones**
  http://www.flickr.com/photos/24717730@N06/page6/

# Quiz:

1- We find fovea capitis in :
   - A- Neck of upper limb
   - B- Head of femur
   - C- Head of tibia
   - D- On tarsal

2- The position where the inter-trochanteric line attached with iliofemoral ligament is:
   - A- Anterior
   - B- Posterior
   - C- Inferior
   - D- Superior

3- inter-trochanteric crest has:
   - A- Posterior,quadrate tubercle
   - B- Anterior, quadrate tubercle
   - C- Inferior, quadrate tubercle
   - D- Superior, quadrate tubercle

4- Linea aspera:
   - A- ridge, surface, Anterior
   - B- soft, surface, Anterior
   - C- ridge, border, Posterior
   - D- soft, border, Posterior

5- condyles take part in:

A- proximal tibio-fibular joint

B- Distal tibio-fibular joint

C- Hip joint

D- Knee joint

6- Margins of patella give attachment to:

A- Quadriceps femoris muscles.

B- Biceps femoris muscles.

C- Triceps femoris muscles.

D- None of them

7- apex of patella lies:

A- Anterior and connected to tuberosity of tibia

B- Inferior and connected to tuberosity of tibia

C- Anterior and connected to tuberosity of fibula

D- Posterior and connected to tuberosity of tibia

8- Medial bone of the leg:

A- Femur

B- Fibula

C- Tibia

D- Both fibula and tibia

9- groove on its posterior surface for:

A- Subcutaneous

B- Interosseous

C- ligamentum patellae

D- semimembranosus

10- soleal line:

A- Posterior, Surface, Tibia

B- Posterior, Border, Tibia

C- Anterior, Border, Tibia

D- Anterior, Surface, Tibia

11- Metatarsal numbered from:

A- Lateral to medial

B- Medial to lateral

C- Tall to short

D- Short to short

12- The patella :

A- Lies on the back of the knee joint.

B- Has apex lying superiorly.

C- Has smooth articulating anterior surface.

D- Gives attachment to quadriceps femoris muscles.

13- Which one of the foot bones contributes in the ankle joint:

A- Calcaneum.

B- Talus.

C- Cuboid.

D- Navicular.

14- The tarsal bones of foot consists of :

A- 5 bones.

B- 7bones.

C- 9 bones.

D- 10 bones.

15- Which one of the following bones forms the heel of foot:

A- Talus.

B- Calcaneum.

C- Cuboid.

E- Navicular.

16- The lateral bone of the leg is :

a. Femur.

b. Humerus.

c. Tibia.

d. Fibula.

17- Which one of the following bones is the largest bone in the foot:

A- Cuboid.

B- Cuneiform.

C- Navicular.

D- Calcaneum.

| N.Q | ANSWER |
|---|---|
| 1 | B |
| 2 | A |
| 3 | A |
| 4 | C |
| 5 | D |
| 6 | A |
| 7 | B |
| 8 | C |
| 9 | D |
| 10 | A |
| 11 | B |
| 12 | D |
| 13 | B |
| 14 | B |
| 15 | B |
| 16 | D |
| 17 | D |

GOOD LUCK :)