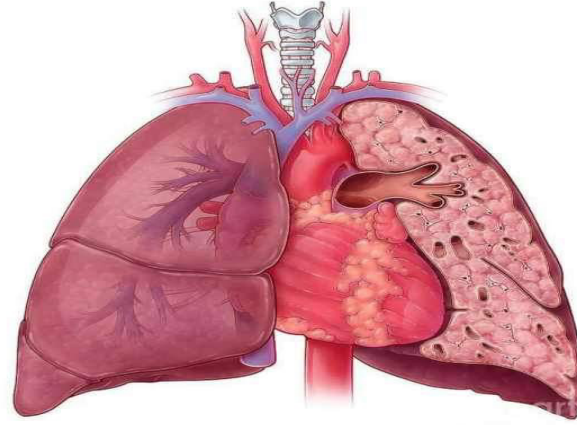


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لجان الدُّفعات



تفريغ أناتومي

موضوع المحاضرة: Skeletal System | part 4

رقم المحاضرة: 12

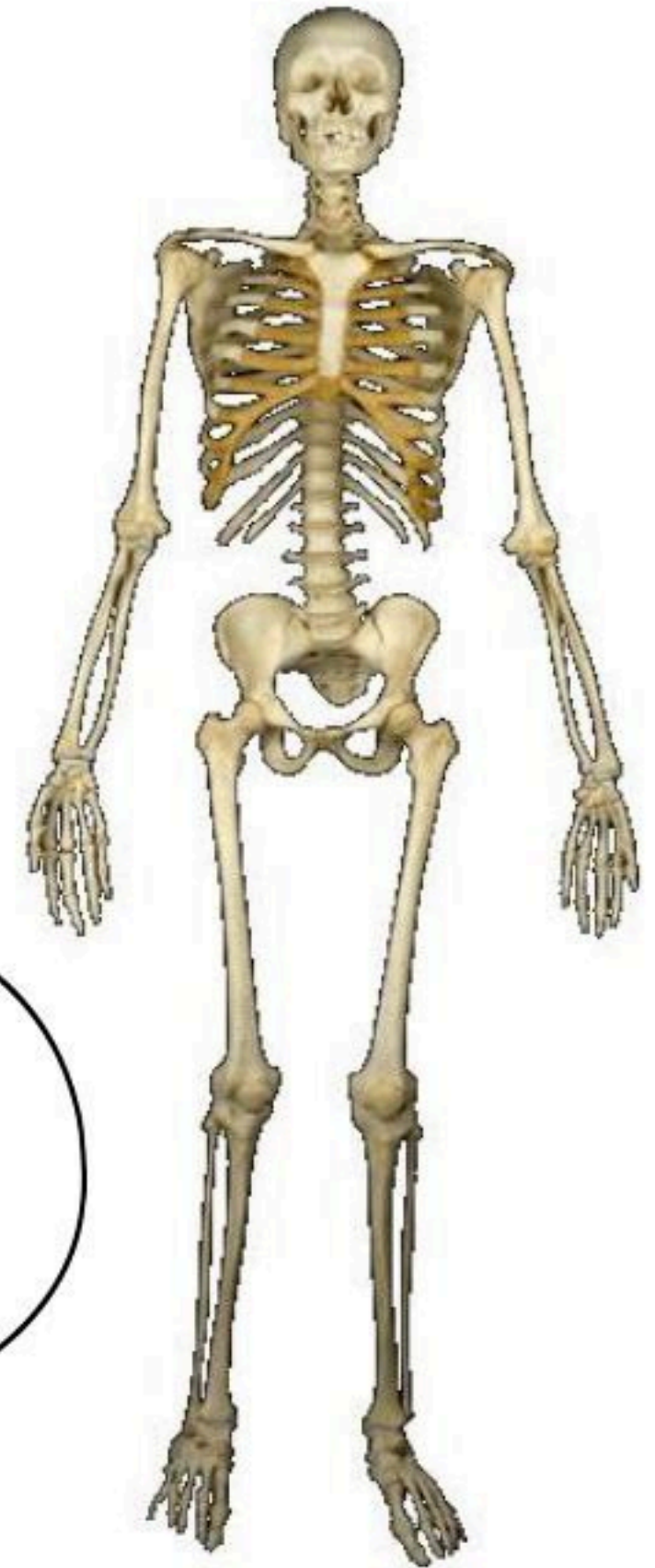
إعداد الصيدلانية: Aya Mohammad



The Skeletal System

Dr. Mustafa Saad
(2021)

محاضرة الاعداد 1 4 part
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رح نكمل حكيينا عن skeletal system
بالتحديد ال lower limb
ال lower limb بكون 31 
وبنقسم لقسمين :
١ ال (hipbone) pelvic girdle
2 ضل 30 bone
1 femur 1 patella 1 tibia
1 fibula 7 tarsal
5 metatarsals 14 phalanges

The Lower Limb

- Each lower limb has 31 bones
- Two separate regions ينقسم
- 1. The pelvic girdle which attaches lower limbs to trunk → 1 hip bone on each side
- 2. The free part (30 bones):
 - 1 Femur (thigh) الفخذ
 - 1 Patella هيايونة الركبة
 - 1 Tibia + 1 Fibula (leg)
 - 7 Tarsal bones
 - 5 Metatarsals and 14 Phalanges (foot) نحو 8 باليد اسمها carpals كلنا 8



Fig.30: Anterior view of the lower limb bones.

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The Hip (Coxal) Bone:

- Each hip bone consists of three bones that fuse together: ilium, pubis, and ischium
- The two hip bones are joined anteriorly at the pubic symphysis and they're joined posteriorly to the sacrum at the sacroiliac joints

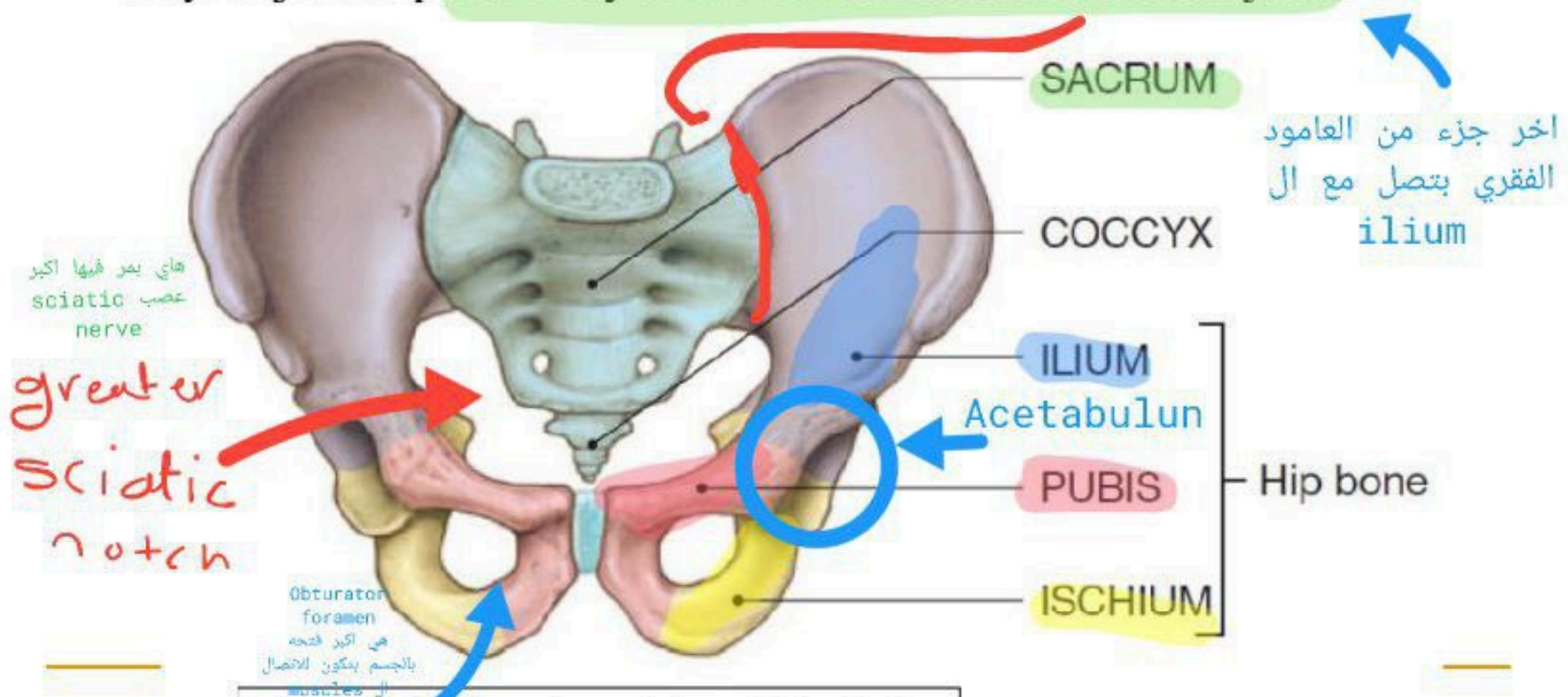


Fig.31: Anterior view of the pelvic girdle.

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The Ilium:

- Largest and most superior of the three hip bones.
- Superior border - iliac crest. Possess a tubercle
- Has four prominent projections: the superior and inferior anterior and posterior iliac spines
- Greater sciatic notch is located between the posterior inferior iliac spine and the ischial spine. Through it pass the sciatic nerve

The Pubis:

- Pubis - inferior and anterior part of the hip bone
- The two pubic bones meet at the pubic symphysis. The angle below this joint is called the pubic arch

انشرح بالجزي الثالث

The Ischium:

- Ischium - inferior and posterior part of the hip bone
 - Most prominent feature is the ischial tuberosity, it is the part that meets the chair when you are sitting
 - Ischial spine – a prominent projection. Below the spine we have the lesser sciatic notch
-
- ❑ The 3 bones fuse at and participate in the formation of the acetabulum which is the site of articulation with the head of femur.
 - ❑ The obturator foramen is bounded by the pubis and ischium. It's the largest foramen in the body.
 - ❑ Differences exist between the male and female pelvis. The features of the female pelvis permit easier process of child birth.

The Femur:

الحول واكبر وأعظم عظمة في الجسم "عشان تحمّل الجسم" عظمة النقرة

- Femur - longest, heaviest, and strongest bone in the body

- Proximal end:** Features a **head** which articulates with the acetabulum to form the hip joint. The head has a small depression called the **fovea capitis** for attachment of a ligament. Distal to the head is the **neck** and distal to it are the **greater and lesser trochanters**.

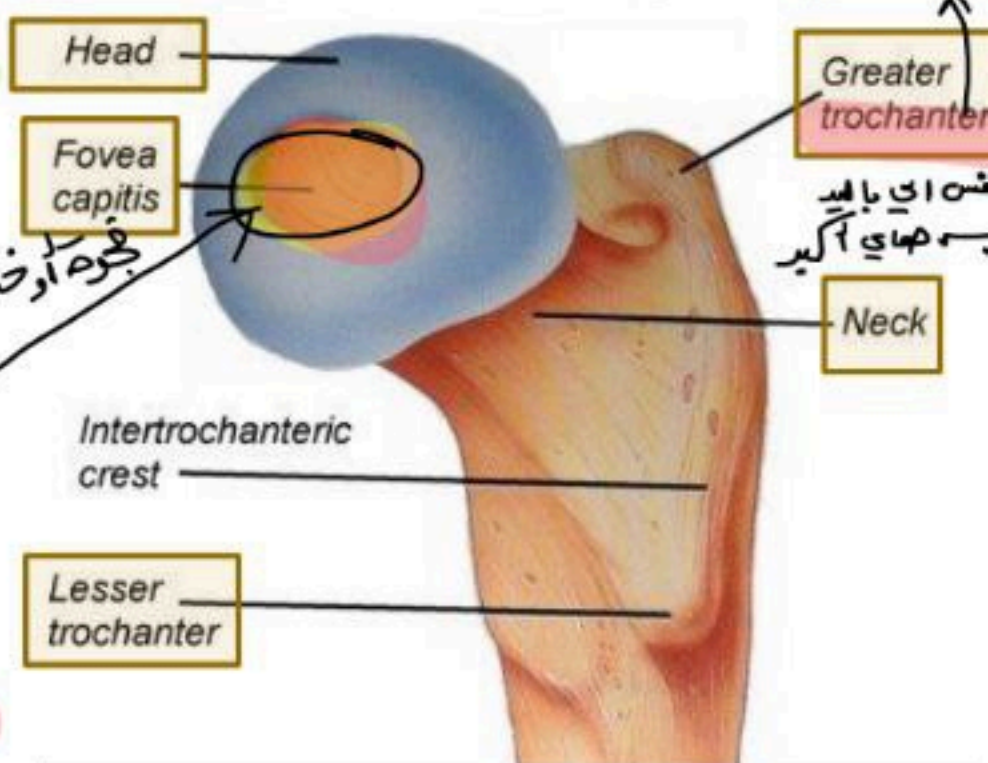


Fig.33: The proximal end of the femur.

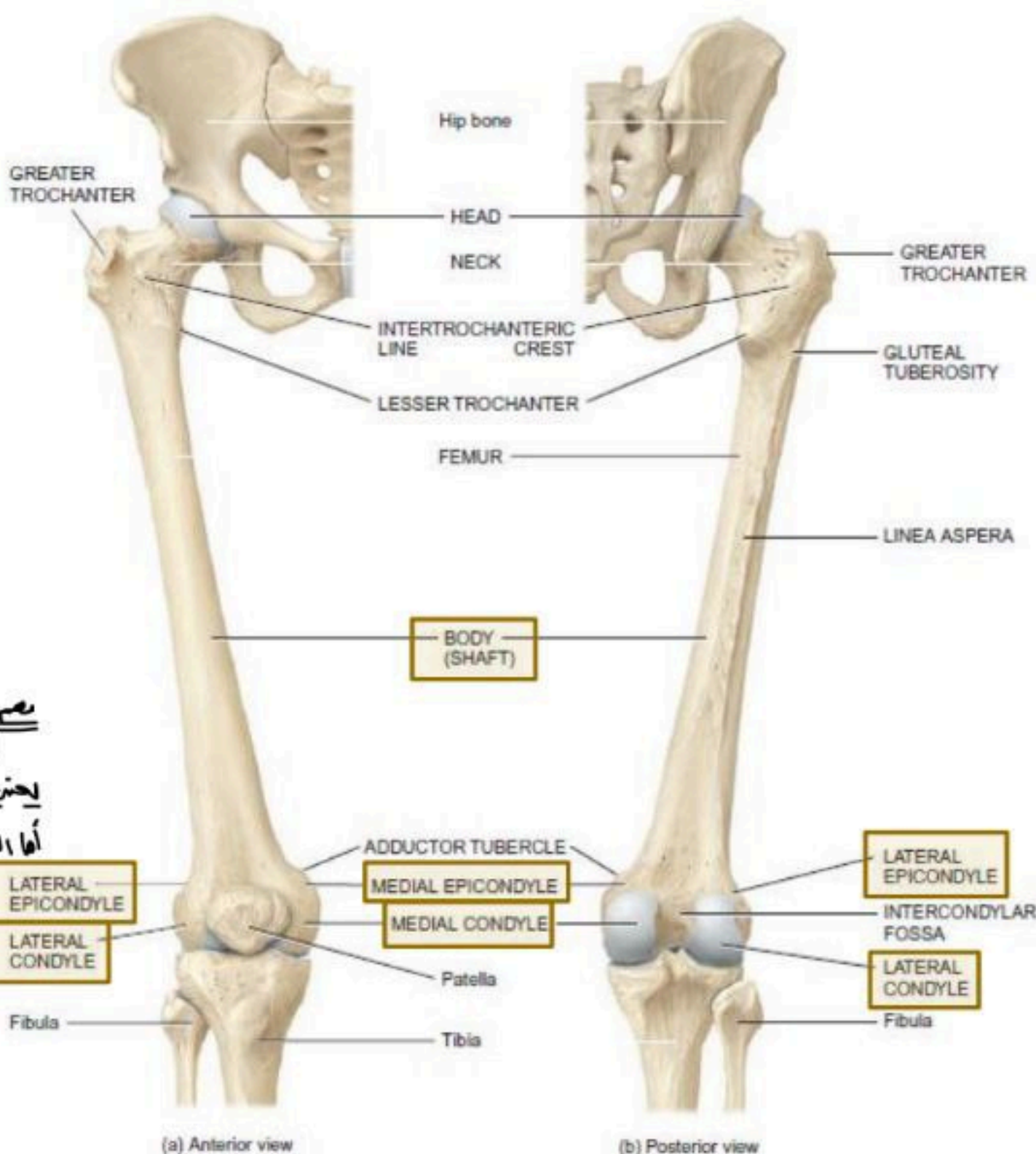
- Shaft:** for attachment of muscles.
- Distal end:** Two **condyles** that articulate inferiorly with the tibia and anteriorly with the **patella**. Proximal to the condyles are the medial and lateral **epicondyles** for muscle attachment.

هنا يونه

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ال Stable
Femur ال تبع ال
أكثر لانه فيه Ligament
بربطه مع
Fovea capitis

Fig.34: Features of the femur bone.



(a) Anterior view

(b) Posterior view

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The Patella: صها بولة

- Largest تويع [sesamoid bone] in the body
- Forms the **patellofemoral joint**
- **Triangular in shape**. The base is superior. The narrow apex is inferior
- Increases the leverage of the quadriceps femoris muscle

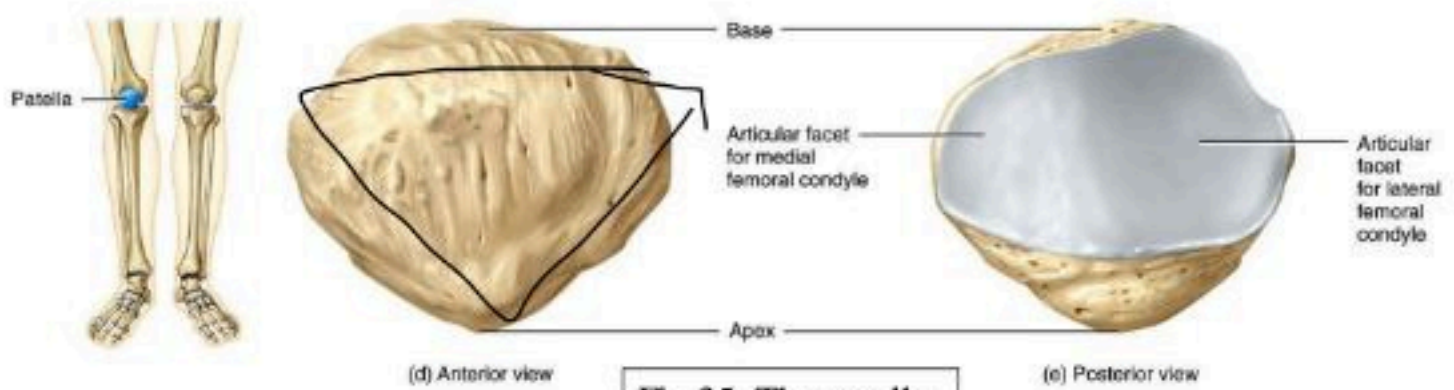


Fig.35: The patella.

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The Tibia (Shin Bone):

- The larger, medial weight-bearing bone of the leg
- **Proximal end**: The **lateral and medial condyles** on the superior surface which articulates with the condyles of the femur to form the knee joint.
- **Shaft**: Exhibits the **tibial tuberosity** for attachment of the patellar ligament. The lateral border of the shaft is the sharp **interosseous border**. غشاء رباط بين عظمة Tibia و Fibula
- **Distal end**: It articulates distally with the talus at the **ankle joint**. Features the **medial malleolus**.

The Fibula:

- The smaller, laterally placed bone of the leg
- Non-weight bearing. Serve for muscle attachment
- Shaft – medial interosseous border
- Distal end, articulates with the **tibia and the talus**. Features the lateral malleolus. عظمة من Htarsah

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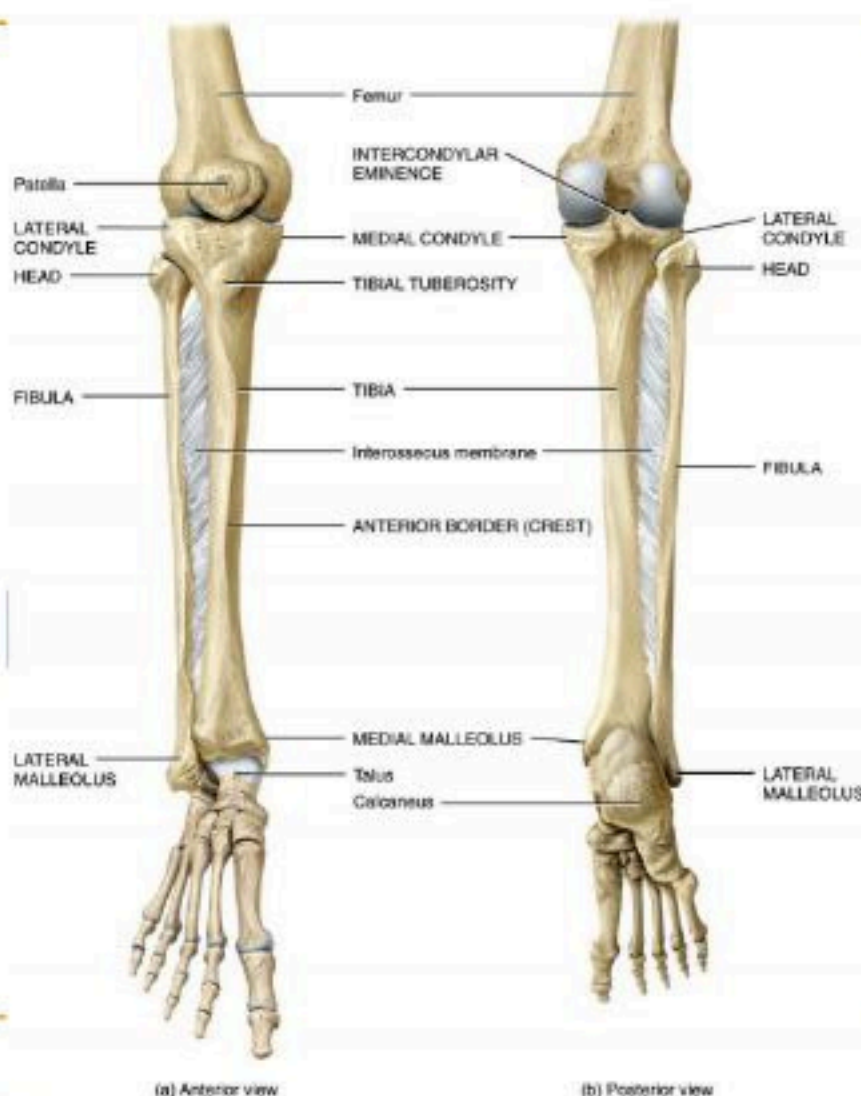
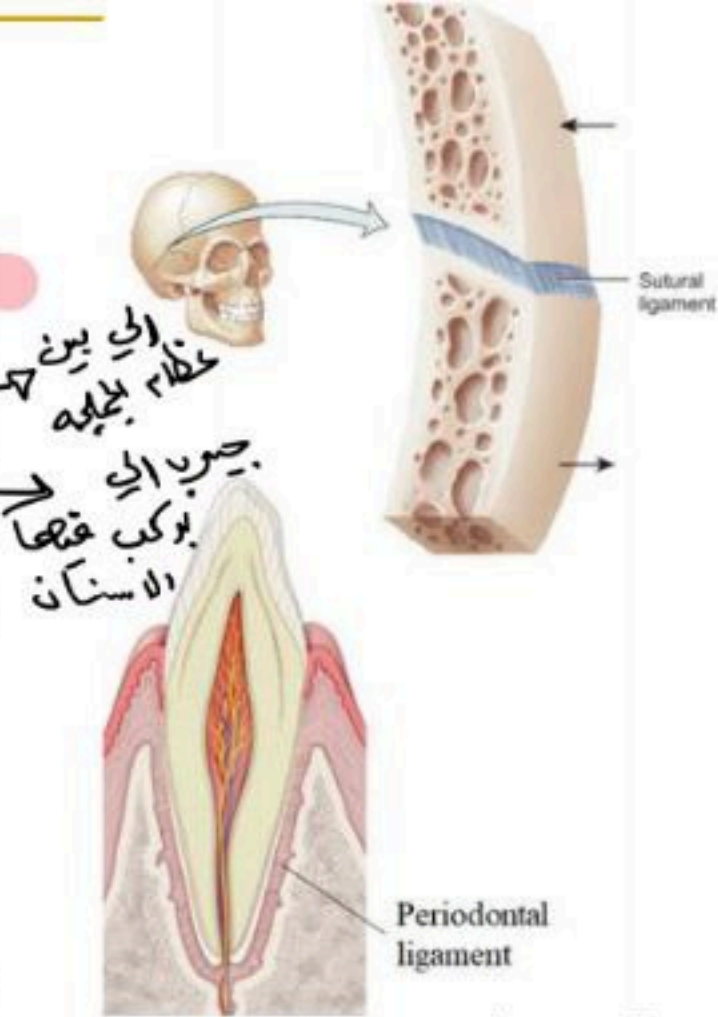


Fig.36: The tibia and fibula.

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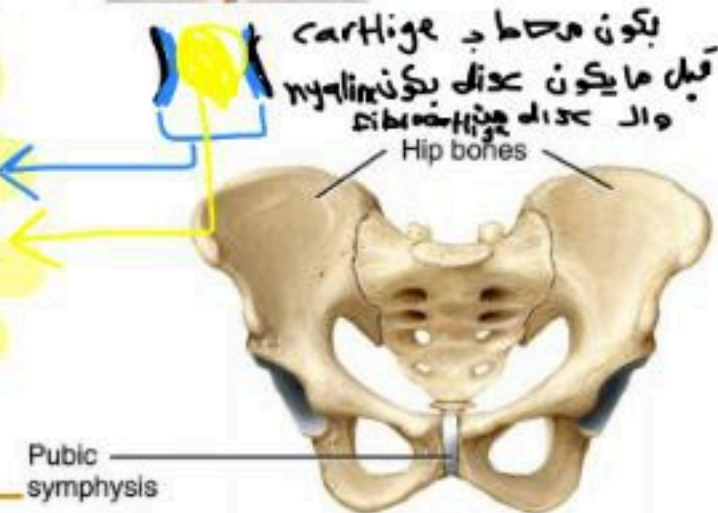
Fibrous Joints:

- Bones are held together by **dense collagenous irregular** connective tissue with no cavity. Example: (1) **Sutures** between most skull bones and (2) **Gomphoses** in which a **cone-shaped peg** fits into a socket (like joints between teeth and their sockets).



Cartilaginous Joints:

- Bones are held together by **cartilage** with no cavity. **Symphyses** are joints in which **articulating bones** are covered by **hyaline cartilage** with a **disc of fibrocartilage** between the bones. Example: **symphysis pubis** and the **intervertebral joints**.



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Synovial Joints:

- 1) A **synovial cavity** allows the joint to be freely movable.
- 2) Articular surfaces of bones are covered by **hyaline articular cartilage**.
- 3) Surrounded by **articular capsule** which is formed of an outer fibrous capsule and an inner synovial membrane.
- 4) The cavity contains **synovial fluid** secreted by the synovial membrane. This fluid (1) lubricates the joint, (2) absorbs shocks, and (3) maintain the cartilage.

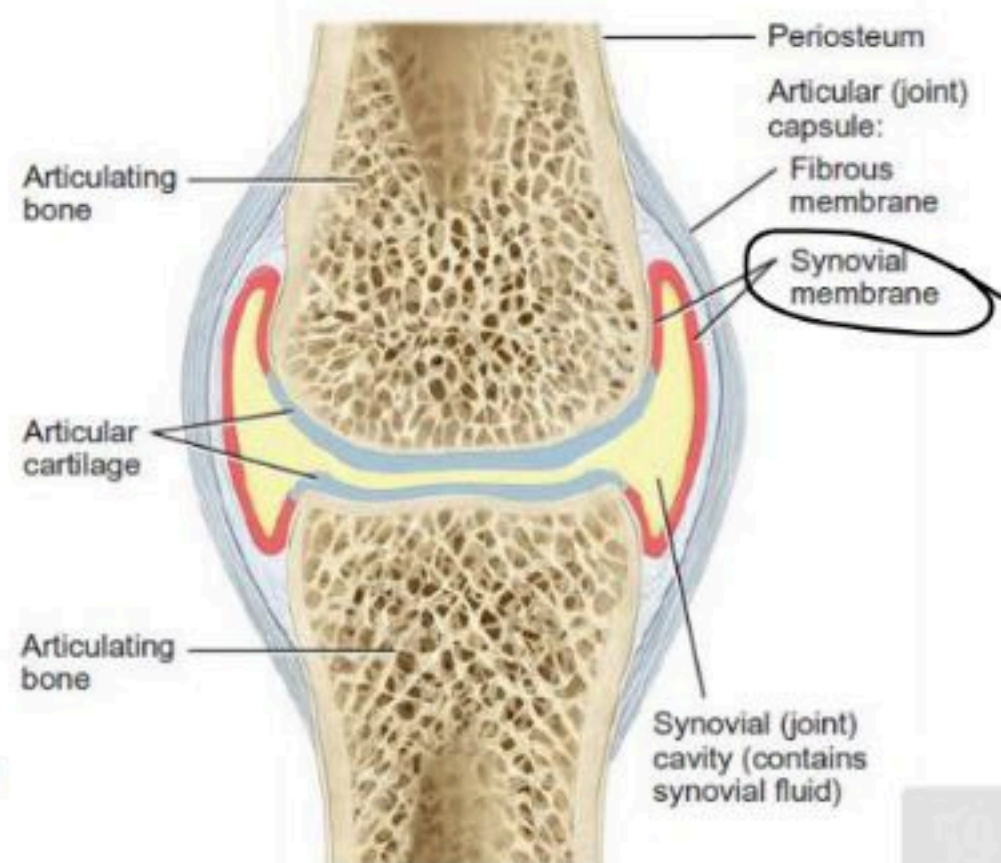


Fig.38: Features of synovial joints.

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5) Ligaments and articular discs

6) Nerve and Blood Supply

- Branches from different arteries anastomose around a joint to ensure sufficient blood supply to the joint.

7) Bursae and Tendon Sheaths

- Bursae
 - Sac-like structures containing fluid similar to synovial fluid
 - Located between tendons, ligaments and bones
 - Cushion the movement of these body parts
- Tendon sheaths
 - Tube-like bursae that wrap around tendons
 - Reduce friction at joints

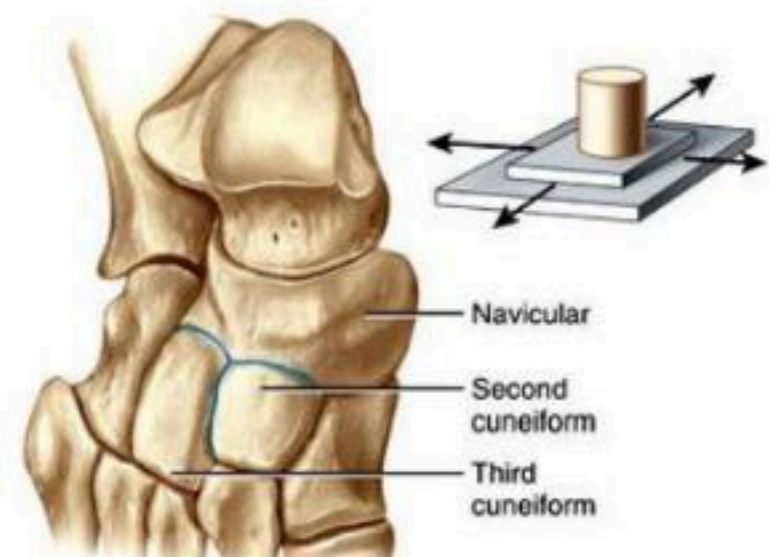
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Types Synovial Joints:

- Synovial joints are classified according to type of movement and the shape of the articulating bones into:

1) Planar Joints

- Primarily permit gliding movements.
- Intercarpal joints.



2) Hinge Joints

- Produce an opening and closing motion like that of a hinged door.
- Permit only flexion and extension.
- Knee, elbow, and the interphalangeal joints.

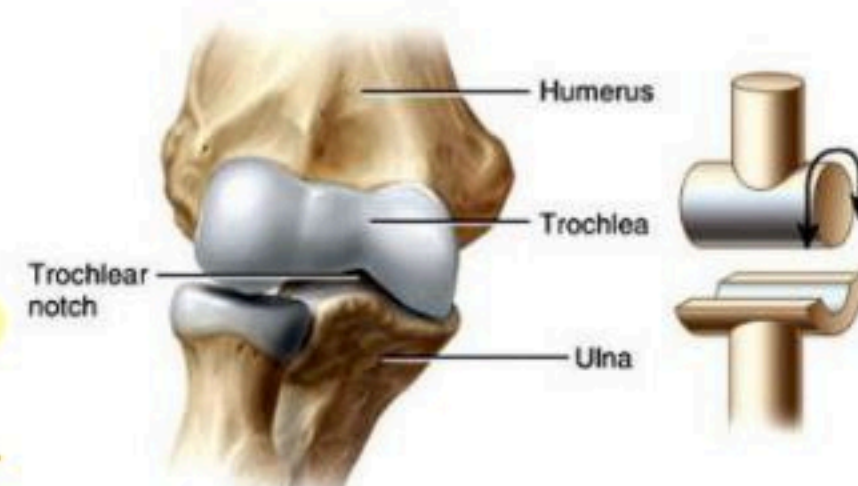


Fig.39: Planar (top) and hinge (bottom) joints.

3) Pivot Joints يكون مفتاح الدورات

- Surface of one bone articulates with a ring formed partly by another bone.
- Only rotation can occur
- Atlantoaxial and radioulnar joints

4) Condyloid Joints

- Oval projection of one bone fits into the oval-shaped depression of another bone.
- Flexion, extension, abduction and adduction are allowed
- Wrist



Fig.40: Pivot (left) and condyloid (right) joints.

السرج

5) Saddle Joints

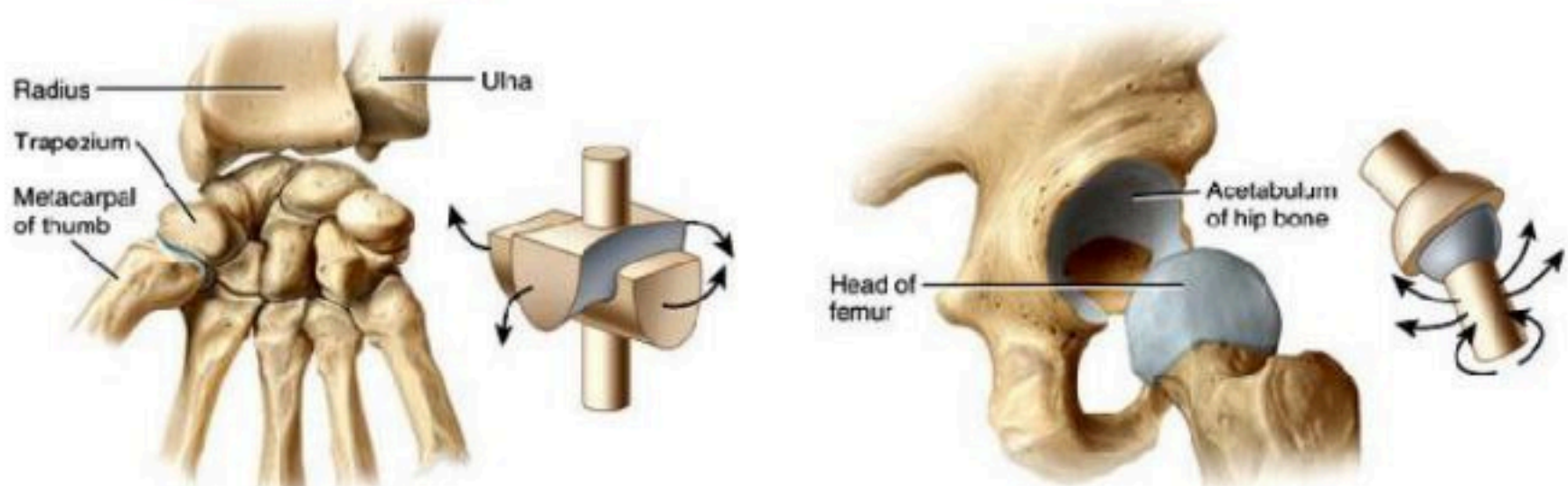
- Articular surface of one bone is saddle-shaped, and the articular surface of the other bone fits into the "saddle"
- Flexion, extension, abduction and adduction
- Carpometacarpal joint of the thumb

6) Ball-and-Socket Joints

- Ball-like part of one bone fitting into a cup-like depression of another bone
- Flexion, extension, abduction, adduction, circumduction and rotation are allowed
- Shoulder and hip

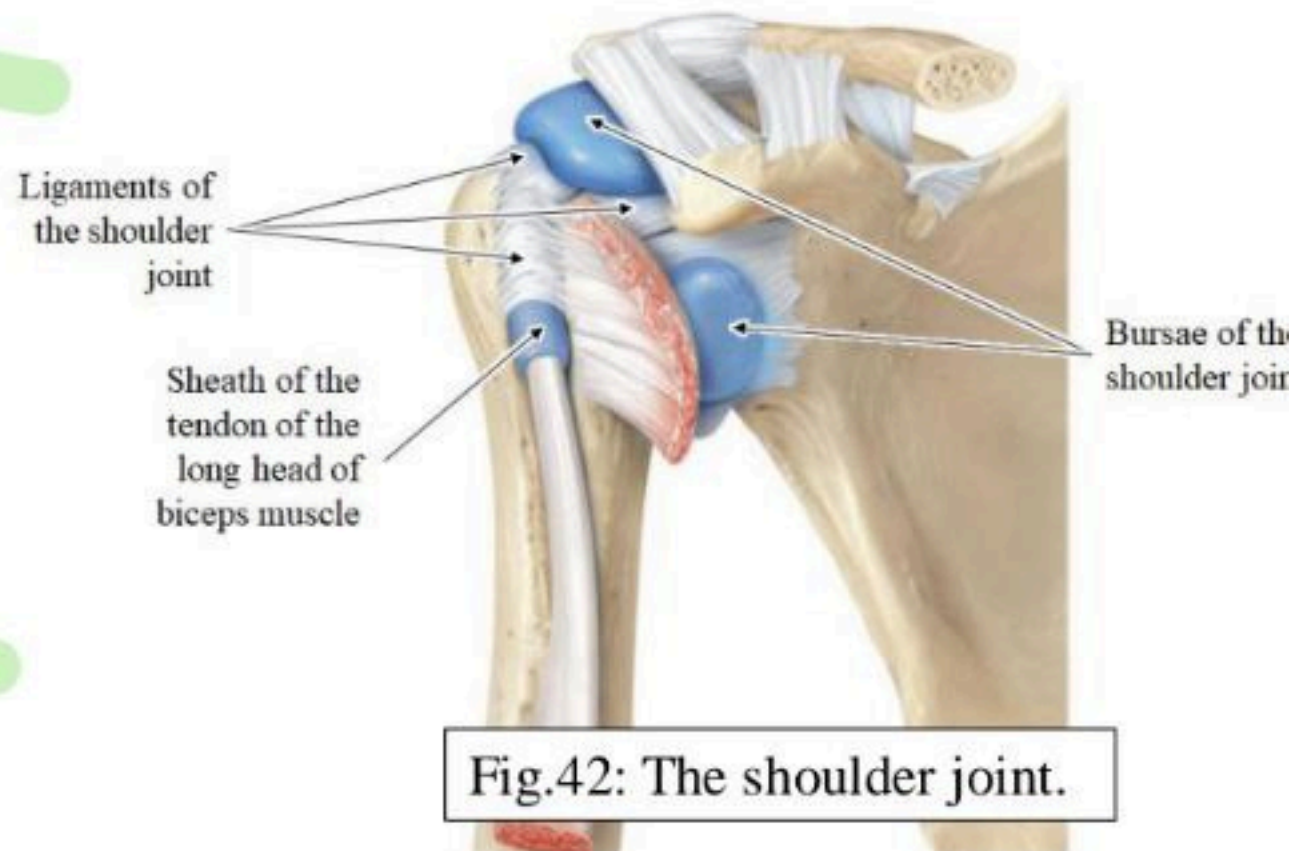
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The Shoulder (Glenohumeral) Joint:

- ❑ Synovial ball-and-socket joint formed by the head of the humerus and glenoid cavity of the scapula
- ❑ **Movements:** Flexion, extension, abduction, adduction, circumduction, and medial and lateral rotation.

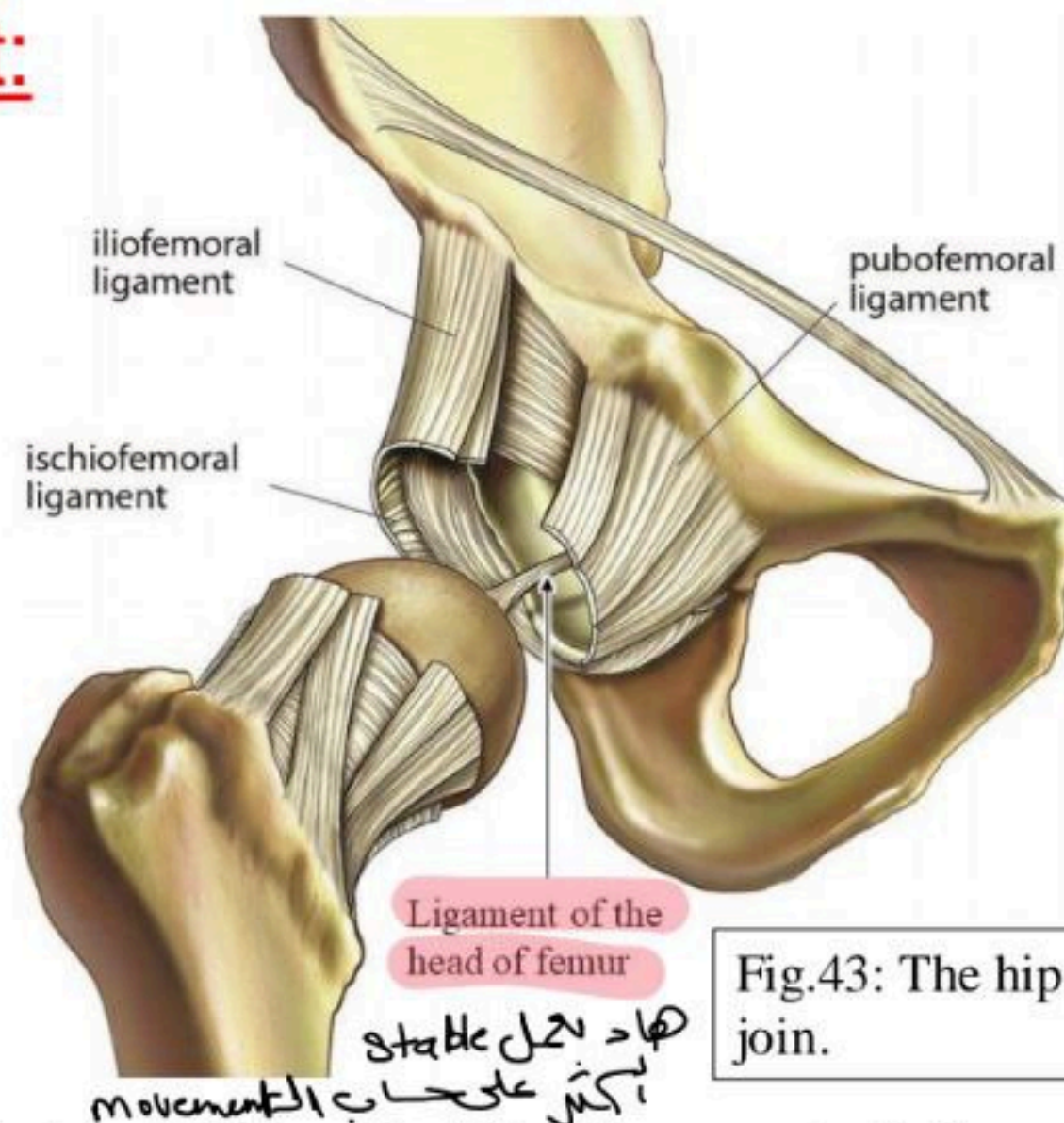


- ❑ *More freedom of movement than any other joint of the body which comes at the expense of stability*
- ❑ **Rotator Cuff:** a group of muscles that surrounds and stabilizes the shoulder joint. They keep the head of humerus in position.

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The Hip (Coxal) Joint:

- ❑ Synovial ball-and-socket joint formed by the head of the femur and the acetabulum of the hip bone.
- ❑ A very stable joint on the expense of decreasing range of movement.
- ❑ **Movements:** Flexion, extension, abduction, adduction, circumduction, and medial and lateral rotation.



- ❑ Ligaments outside the joint help stabilize it. The *ligament of the head of femur* is found within the joint and keep the head of the femur in its place inside the acetabulum.

هذا بصل stable
أكثر على حساب المovement

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The Knee Joint:

- ❑ Synovial modified-hinge joint formed by the femur, tibia and patella.
- ❑ Movements: Flexion, extension, and slight medial and lateral rotation of the leg when flexed.
- ❑ Ligaments outside and inside the joint help stabilize it.
- ❑ Menisci: Two fibrocartilage discs between the tibial and femoral condyles help compensate for the irregular shapes of the bones.

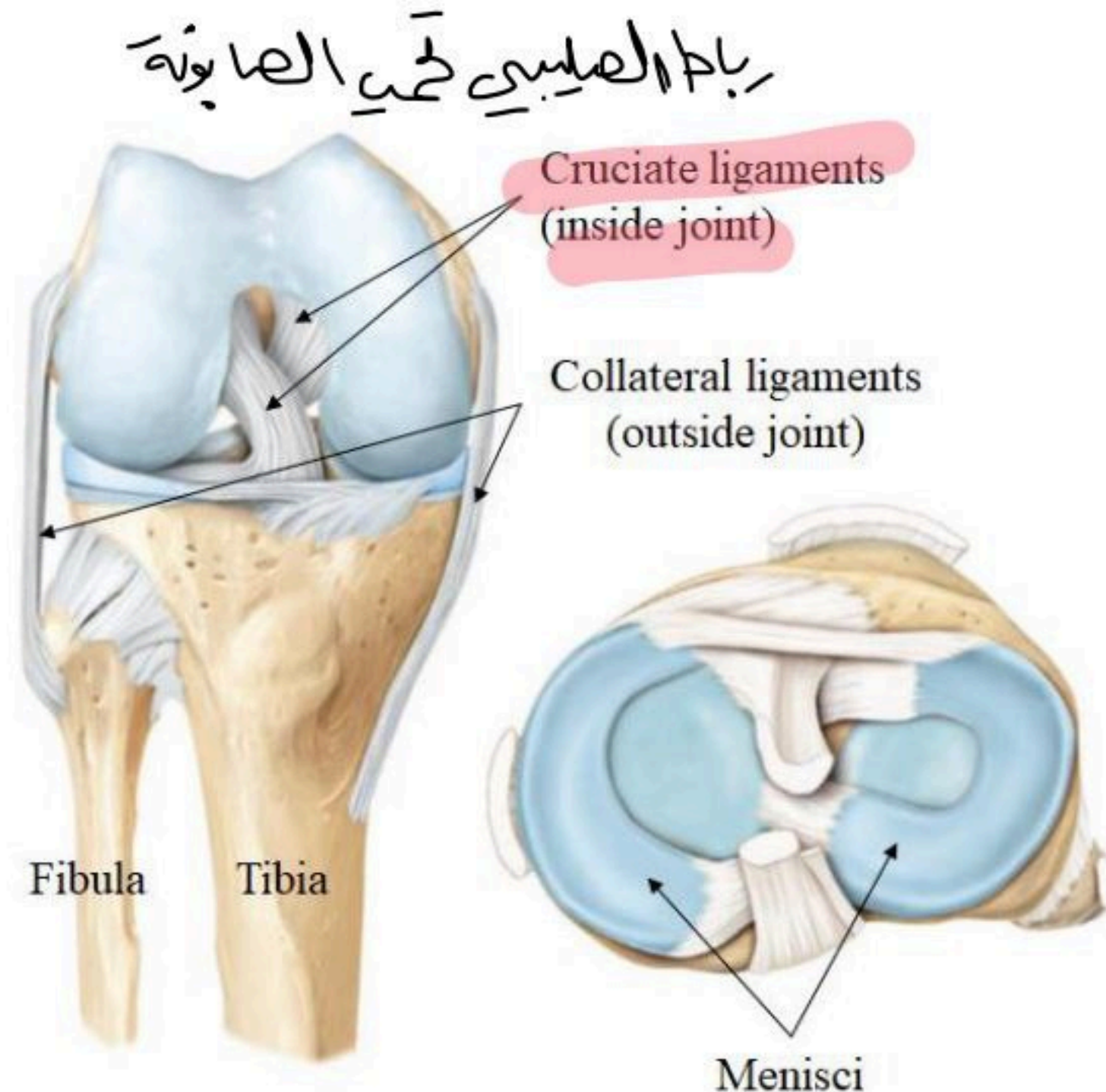


Fig.44: Knee joint: ligaments and menisci.

ما تنسونا من دعواتكم



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