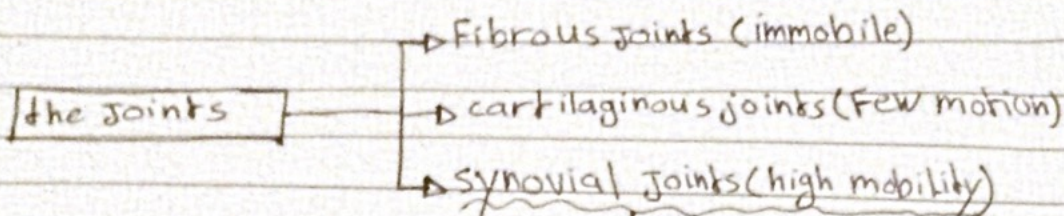
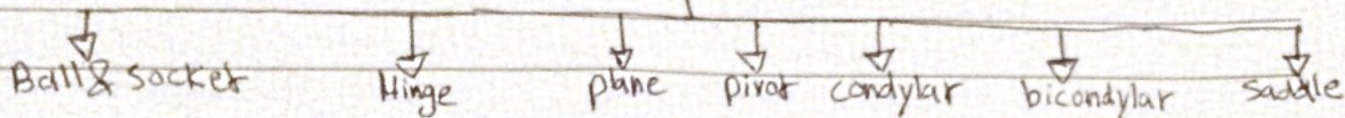


## \* Joints of the lower limb :-

### Introduction :-



Movement of synovial joints is determined by articulating surfaces + ligaments



- the movement around lower limb occurs at 3 joints :-

### 1- Hip joint :-

\* Type :- synovial, multi-axial ball & socket joint

\* articular surfaces :- lunate surface of acetabulum + head of femur  
notes - Articular surface of acetabulum is increased by labrum acetabulare

\* nerve supply :- femoral, sciatic & obturator nerves.

Hilton's law :- any nerve that cross a joint supplies :-  
\* muscles acting on it \* the skin over it \* The joint itself

### \* capsule of the joint :-

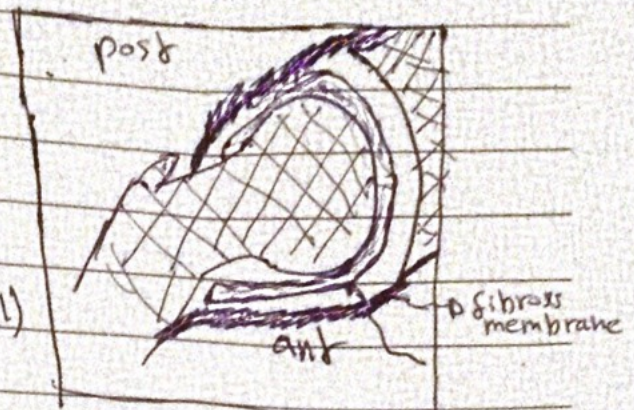
- fibrous capsule extends from the margins of acetabulum to trochanteric line anteriorly (covering the neck).  
posteriorly to the femoral neck, its attached on the neck, 12 mm from the trochanteric crest

- synovial membrane :- lines the fibrous layer & any intracapsular bone not lined by articular cartilage.

▷ the synovial membrane reflects proximally along the femoral neck to the edge of femoral head

\*important :- this synovial fold, contains sub synovial retinacular arteries - (seen below)

\*Blood supply of the head of femur  
 1- retinacular arteries, as branches from medial & lateral circumflex femoral arteries (especially medial)

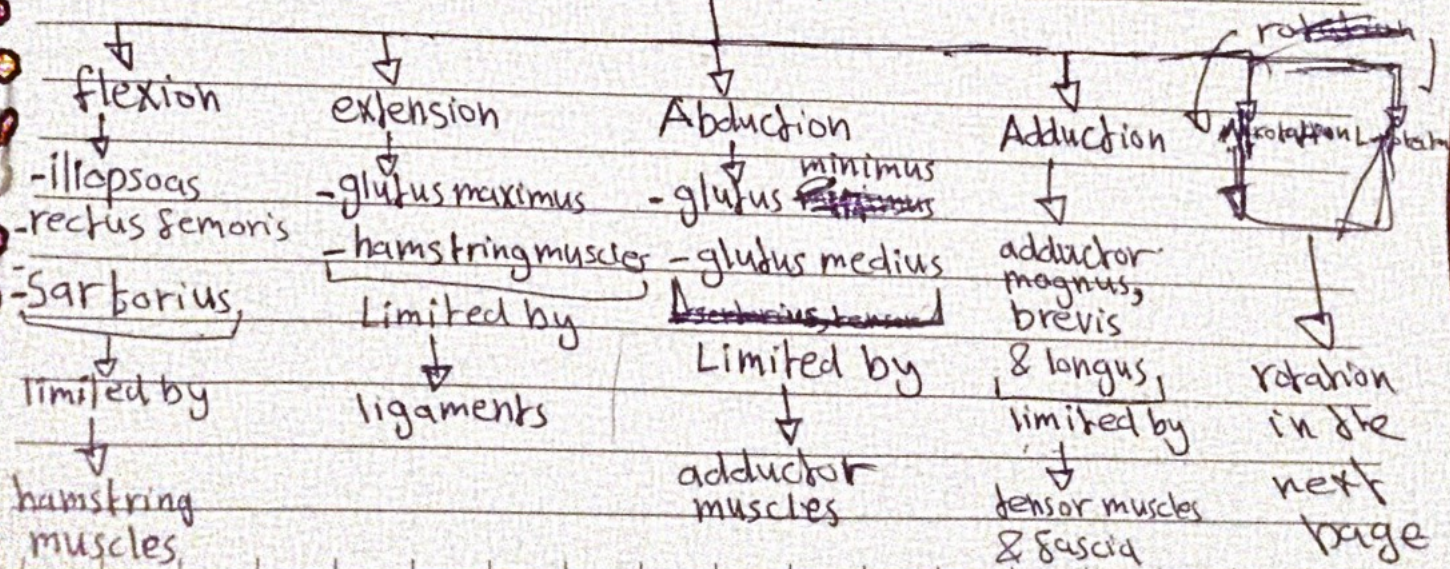


2- artery to the head of femur, a branch from the obturator artery.

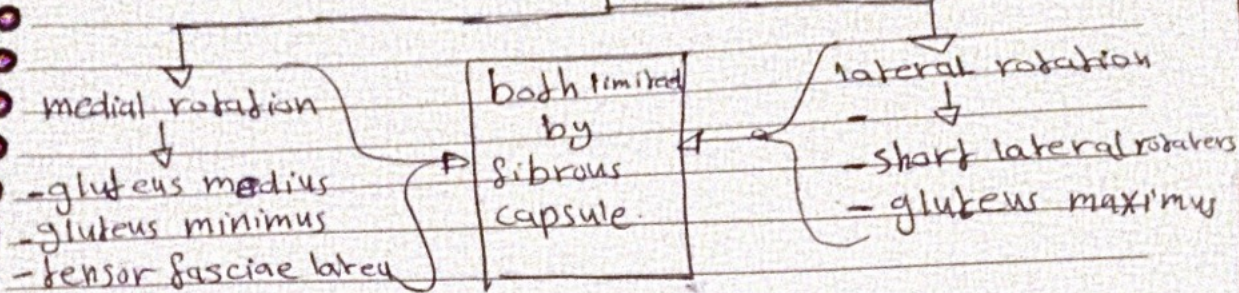
\* Ligaments of the hip joint :-

- a- iliofemoral :- y-shaped, strongest one, prevents hyper-extension
- b- pub femoral :- limits extension & abduction
- c- ischio femoral :- limits extension
- d- Ligamentum teres :- synovial fold, conducting blood vessels, its wide attachment to margin of acetabular notch & transverse acetabular ligament, its narrow end attached to fovea.
- e- Transverse acetabular ligament :- closes acetabular notch

movement of Hip joint



## \* Hip joint movements



\* notes - Angle of Inclination  $\approx 125^\circ$   
(normally between  $115^\circ - 140^\circ$ )  $\rightarrow$  it's  $160^\circ$  in infants

## 2 - Knee joint :-

\* Consists of 3 articulating surfaces (joints) :-

- 1 - medial condyle of femur + medial condyle of tibia <sup>medial</sup>
- 2 - lateral condyle of femur + lateral condyle of tibia <sup>hinge</sup>
- 3 - patella & patellar surface of femur <sup>gliding</sup>

\* note :- lateral condyle of femur is longer than medial  
 $\hookrightarrow$  prevent lateral dislocation

\* When standing, the knee joint is locked, to reduce the amount of energy by muscles to maintain the standing position.

Q:- How can we maintain the standing position with minimal muscle work?

- ① by medial rotation of femur on tibia.
- ② the body's center of gravity is anterior to knee joint.
- ③ the iliotibial tract.

Q:- How can we flex our knee again?

A:- by the action of popliteus muscle that laterally rotate the femur on the tibia.

### \*capsule of the knee joint-

- it's attached to articulating surfaces, on the side & posteriorly but absent anteriorly, as it's replaced by the suprapatellar bursa.
- the capsule is strengthened by expansions from vastus medialis & lateralis.
- tendon of popliteus emerges from opening behind the lateral tibial condyle.

### \*Ligaments of the knee joint :-

#### - extracapsular :-

- ligamentum patellae (from lower border of patella to tibial tuberosity)
- lateral collateral ligament: cord like, from lateral condyle to tibia  
↳ separated from lateral meniscus by popliteus
- medial collateral ligament: - flat band, from medial condyle to tibia, attached to medial meniscus.
- oblique popliteal ligament: - derived from semimembranosus posterior to popliteal fossa.

#### - Intra capsular ligaments :-

cruciate ligaments, the main band between femur & tibia.

anterior cruciate ligament

from ant. intercondylar area on tibia  
↳ to medial surface of lateral femoral condyle

prevent post. displacement of femur  
+ ant. displacement of tibia

posterior cruciate ligament

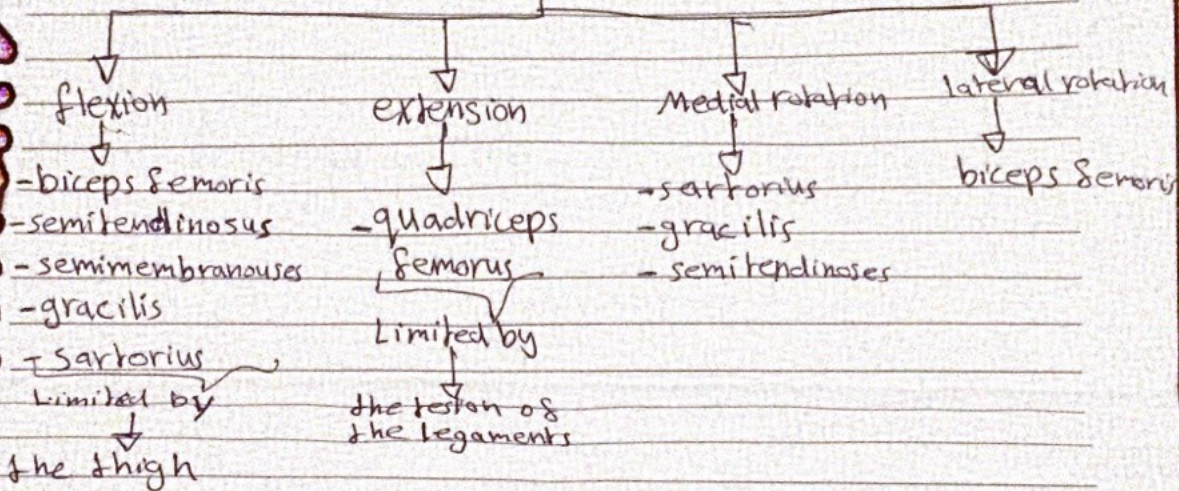
from post. intercondylar area on tibia  
↳ to lateral surface of medial femoral condyle

prevent ant. displacement of femur  
+ post. displacement of tibia

\*menisci:-

- medial & lateral C-shaped sheets of fibrocartilage, that deepen the articulating surfaces & cushions between the bones
- each meniscus is attached to tibia by anterior & posterior horns.

### Movements of Knee joint



### 3- the ankle joint.

\* It's a hinge joint formed by the articulation between the lower end of tibia (lateral & medial malleoli) & the body of talus

\* Ligaments:- medial (deltoid) & lateral

### Movement

dorsi flexion

~~by the muscles of the anterior compartment of the leg~~  
by the muscles of the anterior compartment of the leg

plantar flexion

by the muscles of posterior & lateral compartment of the leg  
Five Apple