This sheet includes information from our lecture and from multiple sources of the Internet but make sure for looking in slides just to see the pictures of the joint

let's started

The hip joint

Sacroiliac joint

the sacroiliac joint connects the Auricular surfaces of the sacrum with the pelvis (iliac bone that is part of the hip joint) on each side of the lower spine. It transmits all the forces of the upper body to the pelvis and legs. There is not a lot of motion in this joint and it is very strong and stable

its mixed between synovial joint and fibrous joint

it's immobile joint but (The sacroiliac ligaments in women are less stiff than in men, allowing the mobility necessary for childbirth)

Associated ligaments

- Posterior sacroiliac ligament
- Interosseous sacroiliac ligament (connecting the tuberosities of the sacrum and ilium. It is the strongest ligament in the body.)
- Anterior sacroiliac ligament

And there are 2 associated ligament in this joint having a special work in converting greater and lesser sciatic notch to foramen where sciatic nerve pass from here

Sacrotuberous ligament && Sacrospinous ligament

The hip joint

the hip joint is one of the most important joints in the human body. It allows us to walk, run, and jump. It bears our body's weight and the force of the strong muscles of the hip and leg & allows a greater range of motion than all other joints in the body except for the shoulder

ball-and-socket synovial joint formed between the head of femur and the acetabulum of 3 hip bones

although shoulder joint more flexible than hip joint but hip joint more stable why ?? cause it bears the weight of the body that make it more stable and hip joint contain group of ligament we call it "Intracapsular ligaments"" we will discuss it later

Nerve supply:

all the nerves passing the hip joint will give sensory fibers toward it

(femoral, obturator, and sciatic nerves and nerve to the quadratus femoris m.)
Hip Joint: Components

**Head of the femur: ball like structure within it fovea capitis** (No articular cartilage in this fovea capitis...its nothing but a small, concave, depression within the head of the femur that serves as an attachment point for the ligamentum teres**

*Neck of the femur: involved in the joint because the articular capsule extend from acetabulum to the neck of femur

*acetabulum: socket like structure (The acetabular margin or rim forms three quarters of a circle with a deficiency located anteroinferiorly called the acetabular notch. This depression is bridged with the transverse ligament of the hip, completing the circle and creating the acetabular foramen. The acetabular floor has a rough depression called the acetabular fossa that hosts the ligamentum teres. The acetabular fossa extends superiorly from the acetabular notch.

The lip-shaped acetabular labrum is a fibrocartilaginous structure attached to the margin of the acetabulum and continue to the notch, increasing the acetabular articular area. As a result, more than half of the femoral head fits within the acetabulum)

- Acetabular fossa: central nonarticular area of the acetabulum is occupied by the haversian fat pad, which is covered by synovial membrane (fat bad act as cushion for head of the femur during the movement)

**Capsule

Proximally attached to acetabulum (acetabular labrum & transverse ligament)

Distally: it extend to the neck of the femur --- remember anterior and posterior surface of the neck

Anterior surface -- intertrochantric line here's attached to the capsule""direct attached"

But in posterior surface above intertrochantric crest there is no attachment " bridge like structure"

We call it free edge of the joint ""not attached directly with bone"

**Ligament " 2 types"

Intracapsular ligament "inside the capsule"

**Transverse acetabular ligament: bridging acetabular notch;; form a channel for entrance of blood vessels

**Ligament of the head of the femur or ligamentum teres femoris: from head of the femur and going inferiorly toward the transverse acetabular ligament

** and because of these intracapsular ligament the stability of hip joint higher than shoulder joint

--Extracapsular ligament

The capsule is strengthened by three ligaments which arise from each bone of the hip, which "unwind" with the hip flexed & externally rotated to lie parallel with the neck & relaxed. Thus extension & medial rotation tightens these ligaments

**iliofemoral ligament (Bigelow)

- is the strongest ligament, & Y-shaped
- stem of the Y arises from the lower half of the anterior inferior iliac spine & going to intertrochanteric line
- its location ""superior and anteior ... goes downward to intertrochanteric line
- from its location ""anterior surface of the joint"". This limits extension, & acts as a fulcrum around which the neck rotates when the head dislocates"

**Pubofemoral ligament
its Triangular shape which located anterior and inferior

- arise from Superior ramus of pubis and goes down to Inferior part of intertrochanteric line
- combines with the iliofemoral ligament Thus it prevents over abduction and extension of the hip

**Ischiofemoral ligament**
- spiral shape & the weakest one of them
  - arise from Ischial part of acetabular rim to greater trochanter of femur
  - possible to see from posterior view of the joint
  - its function to Limits extension and medial rotation "" Why extension ""

To prevent extension the ligament must me anteriorly; and this ligament arises posteriorly but **goes anteriorly** to the g.trochanter & This gives him a function like prevent extension

Note: the hip joint is a stabilize joint

so if we have a weak ligament ;;; we should have a strong muscle surrounding it ;& Vice versa ex
-Anteriorly we have a Strong ligament (iliofemoral) and weak muscles (medial rotatores)
-posteriorly we have a weak ligament (ischiofemoral) and a strong muscles (lateral rotatores)

**Synovial membrane of hip joint:**
- it’s attached from the margins of the articular surfaces of acetabulum to the end of cartilage in the Neck.
- lining the capsule and cover the neck of the femur
- covering the intracapsular ligament

So the synovial membrane is a specialized connective tissue that **lines** the inner surface of capsules of synovial joints

**Synovial fold (retinaculum)**

remember when we talked about free edge that located in the posterior surface of the neck

here’s located synovial fold and also surrounded by synovial membrane

Bursa of the hip

Bursa : is a small fluid-filled sac lined by synovial membrane with an inner capillary layer of viscous synovial fluid (similar in consistency to that of a raw egg white). It provides a cushion between bones and tendons and/or muscles around a joint. This helps to reduce friction between the bones and allows free movement. Bursae are found around most major joints of the body.

-- Psoas bursa
the largest bursa of the human body and is bilaterally present in 98% of adults. This bursa is bounded by the musculotendinous junction of the M. iliopsoas (anteriorly) and by the fibrous capsule of the hip (posteriorly). It extends from the inguinal ligament superiorly to the lesser trochanter inferiorly and is flanked by the femoral vessels (medially) and the femoral nerve (laterally) © M3lesh ©
- Bursa for obturator externus in the posterior surface of joint (free edge)
  the synovial membrane will protrude out of this edge to form obturator externus bursa

- Obturator internus bursa
  Close to the edge of L.sciatic foramen

**Hip movement**
- the difference between muscles movement and muscle action
  movement of joint perform by a group of muscles (like flexors muscles)
  but action of muscle done by only one muscle
  - any muscle cross the joint anteriorly can help in flexion
  - adductor muscles can help in flexion why??

because orientation of adductors muscle from pubic bone and goes to posteriomedial part of the shaft of femur ((anterior "pubic" to posterior)) so pull the muscle toward the origin it will flex the hip joint ""weakly flexors"

HIP JOINT 6

HIP MOVEMENTS

**Abduction**
Gluteus medius, gluteus minimus, tensor fasciae latae
(+/- piriformis)

**Adduction**
Adductors brevis, longus, magnus (pectineus, gracilis, iliopsoas)

**Flexion**
Psoas, iliacus, rectus femor is, sartorius, (pectineus, tensor fasciae latae). Note soft tissue limitation

**Extension**
Gluteus maximus, semitendinosus, semimembranosus, adductor magnus, long head biceps femoris. Note capsule & ligaments limitation

**External rotation**
Gluteus maximus, (piriformis, obturators internus & externus, gemelli, quadratus femoris

**Internal rotation**
Anterior fibres of gluteus medius & minimis

**Hip Joint: Relations**
**anterior to the hip joint**
- iliopsoas;; rectus femoris & pectineus muscle ;;there importance (to isolate femoral triangle from hip joint)

**Posteriorly**
- lateral rotators muscles and they separate sciatic nerve from hip joint

**inferiorly to the hip joint**
- obturator externus muscles

**Superiorly**
- by gluteus minimus and piriformis muscle

...Oriention of acetabulum to head of femur(( superiorly laterally))
acetabulum superiorly located to the head of femur to facilitate weight bearing

**Blood Supply**

-Medial & lateral circumflex artery
- obturator artery

Artery to the head of the femur From obturator artery

but it is a small artery so you need another major supplying for the head of the femur comes from medial circumflex artery "Retinacular arteries"

**-Arterial Anastomosis**

- Trochanteric anastomosis between circumflex arteries and gluteal arteries
- Cruciate anastomosis between Inferior gluteal a. ;femoral circumflex a. ;profunda a.

• Fracture of femoral neck

this type of fracture can lead to damage to blood vessels in the neck and leading to avascular necrosis (not enough blood supply to the neck)

What should we do in this case

Surgical Hip Replacement (Replace head and neck of femur • Often acetabulum lined by metal or plastic socket )

Dislocation of Hip Joint

Congenital dislocation of hip joint ((is when the formation of the hip joint is abnormal;; weakening of the ligament ))

More in female than male

- Trendelenburg’s sign is found in people with weak or paralyzed abductor muscles of the hip, namely gluteus medius and gluteus minimus.

- Hip appear to drop to one side during walking

- Inability to abduct hip
**Acquired hip dislocation**

--this is hard to happen because the high stability of this joint make it very resistant to the accident

but acquired dislocation maybe occur

posterior dislocation

flexion and adduction make femur goes away from the orientation of acetabulum and thats can lead to sciatic nerve injury

our lecture has ended

best of luck