2-Hip Girdle and Thigh

BY
Dr. MUAYAD ABBAS HUSSEIN
Anatomy And Physiology
2nd class biotechnology

THE HIP JOINT

- Type: synovial, ball & socket joint.
- Boney articulation = Acetabulum of hip bone + Head of femur. (Deepened by the labrum).
- Fibrous capsule: encloses the head and neck of femur.
- Stability:

The stability is high with lower range of movements (compared to shoulder joint).

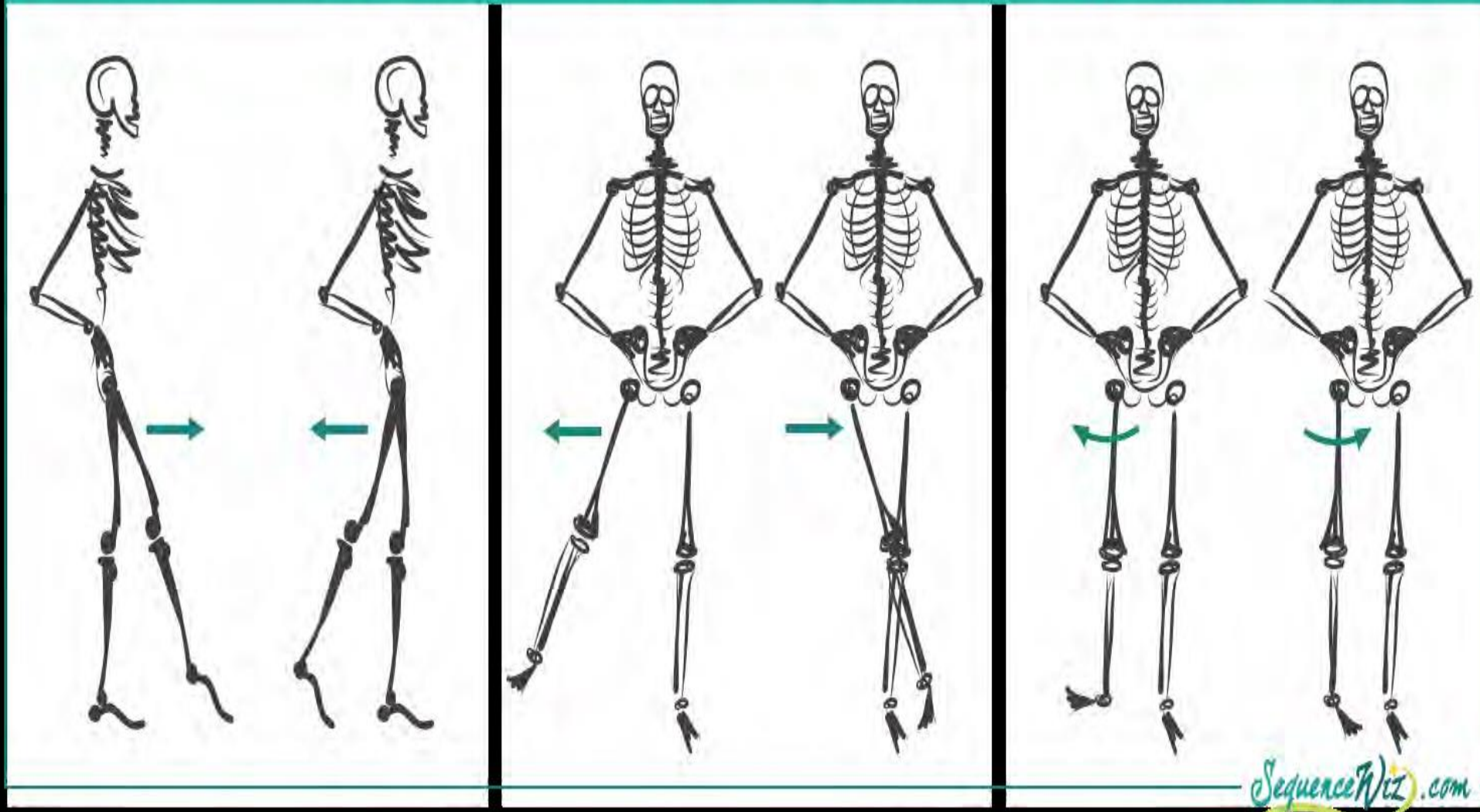
1. Boney factor: close fitting bones.
2. Fibrous capsule and ligaments are strong.
3. Powerful muscles around the joint.

MOVEMENTS OF HIP JOINT:

The hip joint allows flexion, extension, abduction, adduction, circumduction, medial rotation, and lateral rotation of the thigh. The floor of the acetabulum is non articular called Acetabular fossa

Possible hip movements

FLEXION EXTENSION ABDUCTION ADDUCTION EXTERNAL / INTERNAL ROTATION

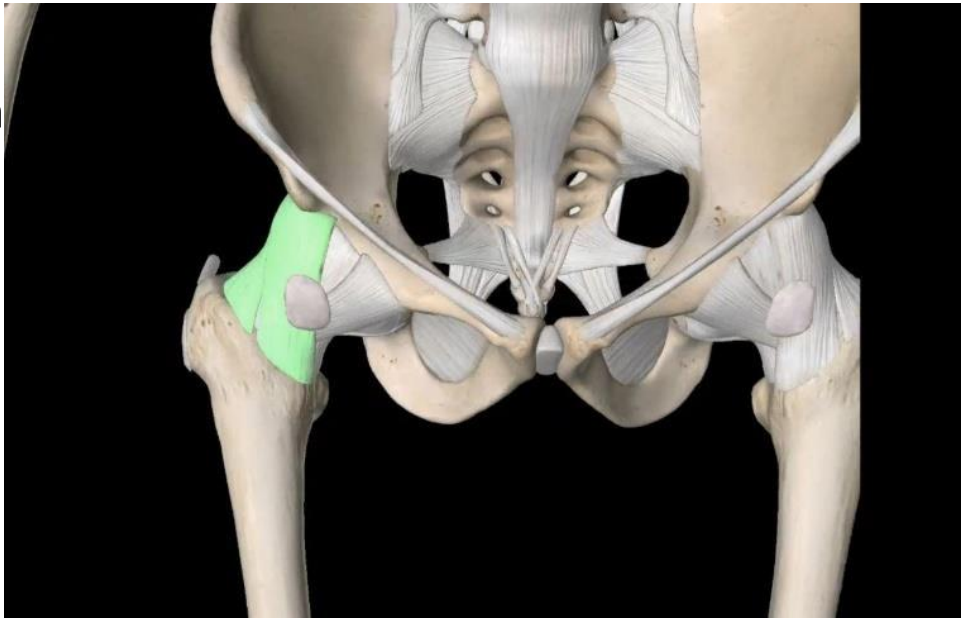


the ligaments of hip and girdle

1-iliofemoral ligament.

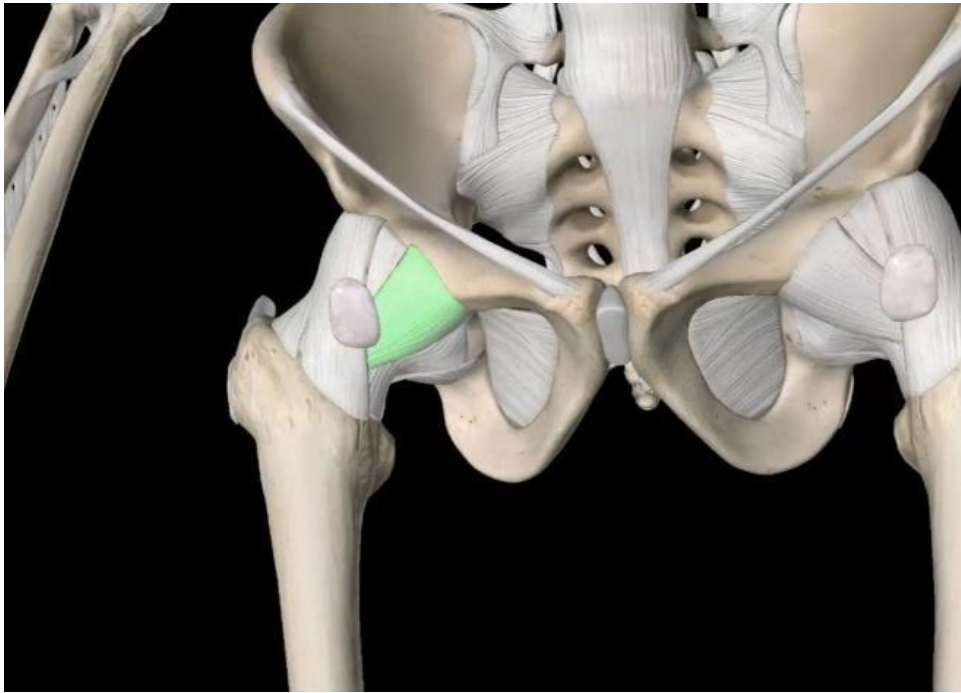
_the iliofemoral ligament attaches between the ilium and the femur.

The iliofemoral ligament is the strongest ligament in the body. It is also (Y) shaped.



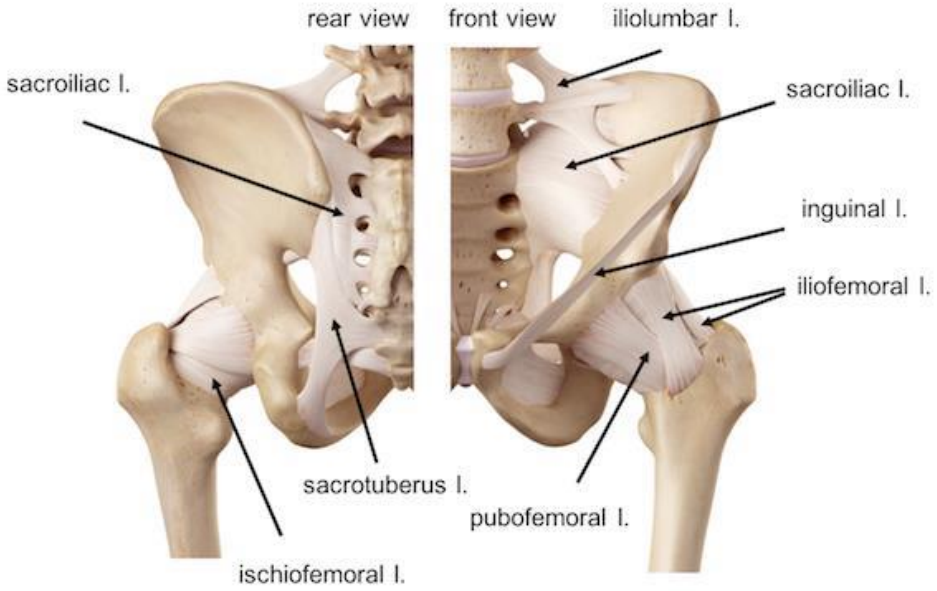
2-pubofemoral ligament.

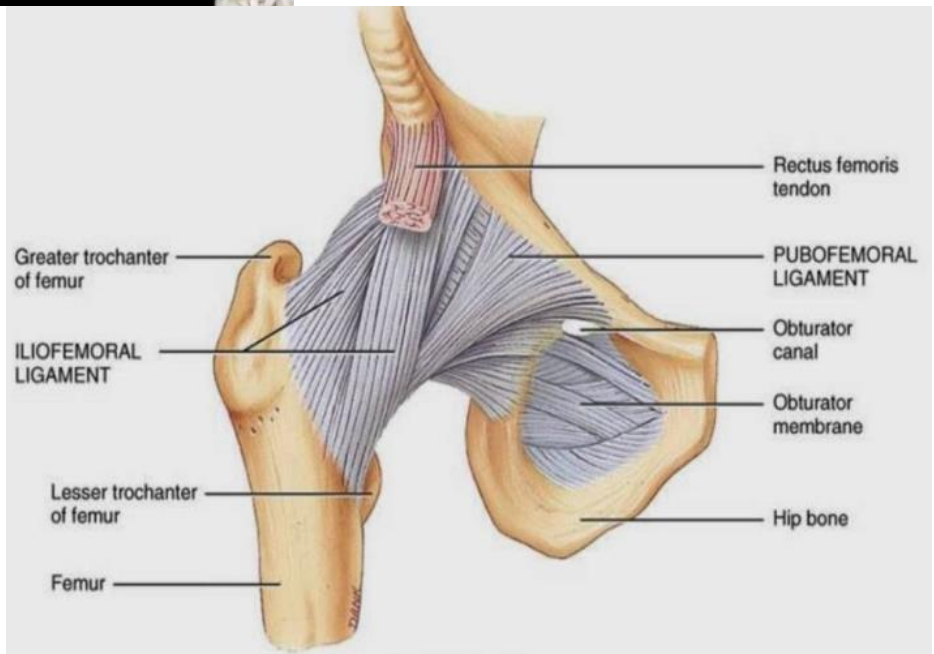
_it is also known as the pubocapsular ligament. It is a supporting ligament located on the inferior side of the hip joint. It extends from the pubic portion of the acetabular rim and passes below the neck of the femur.



3-Ischiofemoral ligament.

_The ischiofemoral ligament is a band of very strong fibers that connect the pelvis and the femur. The specific bone it is attached to is the ischium, which is located in the lower and posterior portion of the hip bone.





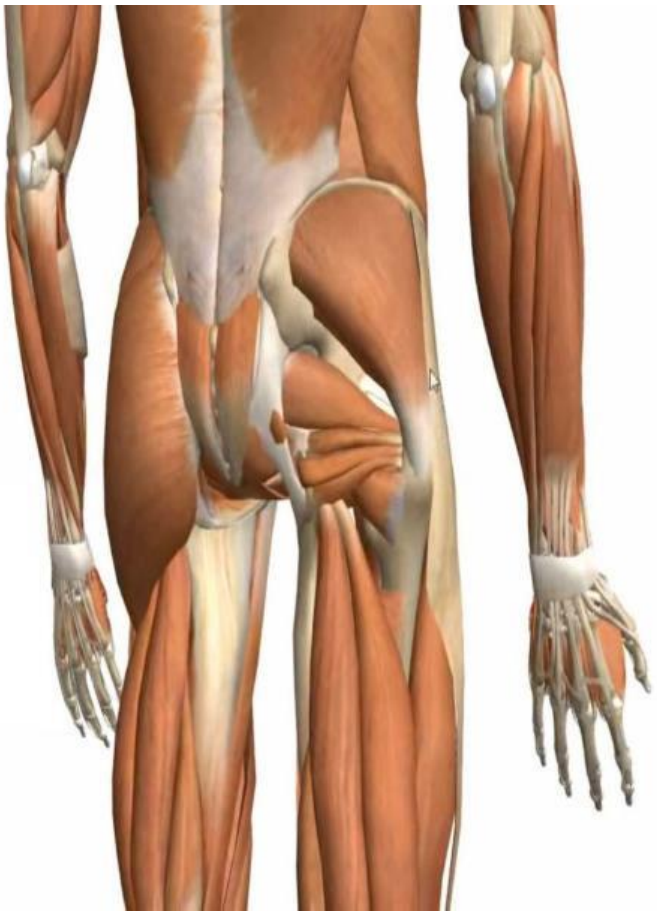
GLUTEAL REGION SUPERFICIAL GROUP MUSCLES (SURFACE FEATURES OF THE BUTTOCK)

1-Gluteus maximus//this muscle innervated by the inferior gluteal nerve.

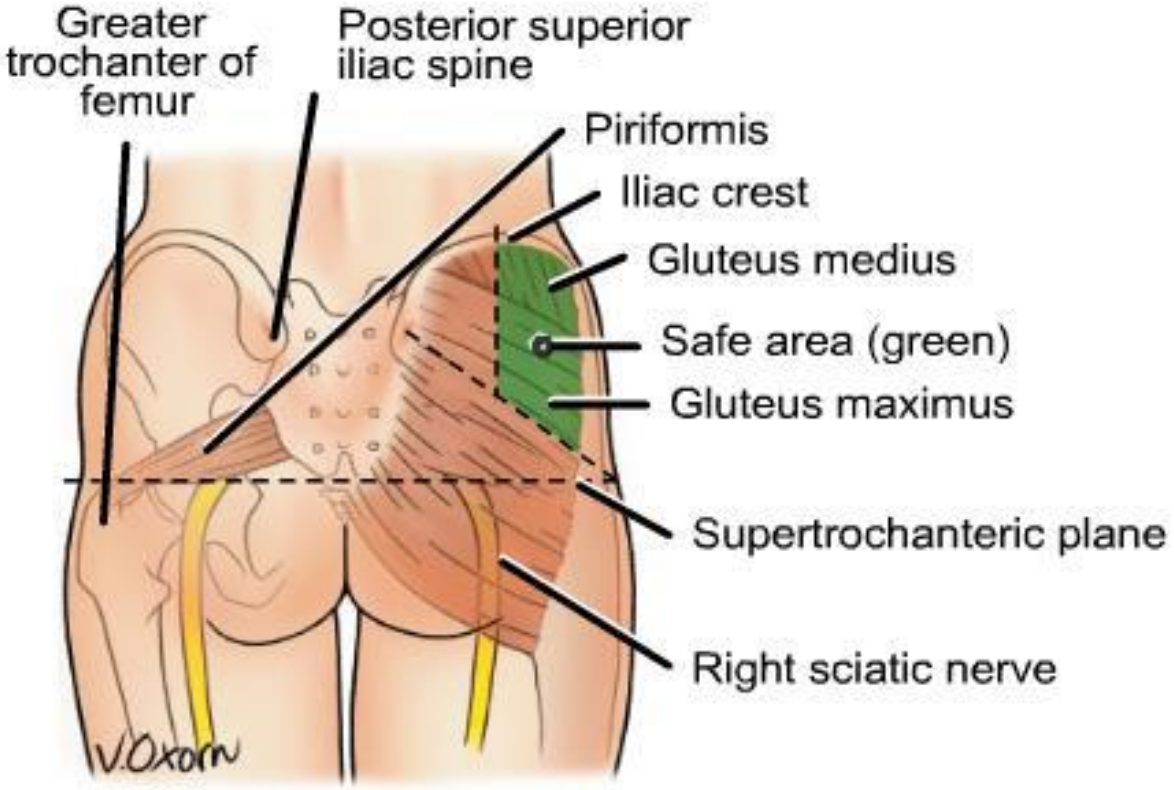
2-Gluteus medius//which lies just underneath the maximus we can see it is fan shaped. It abducts the femur.

3-Gluteus minimus//it lies underneath the medius also an abductor it works together with the gluteus medius.

4-Tensor fasciae lata//this muscle inserts on to a band of fasciae the iliotibial tract. what this muscle does is it stabilizes the knee in extension.



*** Gluteal intramuscular injection**, another common site for an intramuscular injection is the gluteus medius muscle. In order to give this injection, the buttock is divided into quadrants and the upper outer quadrant is used as an injection site. The iliac crest serves as the landmark for this quadrant. This site is chosen because the gluteus medius muscle in this area is quite thick, and there is less chance of injury to the sciatic nerve or major blood vessels.



Posterior View, Intragluteal Injection

*** MUSCLES OF GLUTEAL REGION:**

Muscle	Action	Nerve Supply
Gluteus maximus	Abducts thigh at hip joint and medially rotates thigh	Inferior Gluteal n.
Gluteus medius	Abducts thigh at hip joint and medially rotates thigh	Superior gluteal n.
Gluteus minimus	Flexes and abducts thigh at hip joint	Superior gluteal n.
Tensor Fasciae latae	Laterally rotates and abducts thigh at hip joint	Superior gluteal n.
Piriformis	Laterally rotates and abducts thigh at hip joint	Sacral nerve S1 and S2
Obturator externus	Laterally rotates and abducts thigh at hip joint	Obturator nerve
Obturator internus	Laterally rotates and abducts thigh at hip joint	Sacral plexus
Superior gemellus	Laterally rotates and abducts thigh at hip joint	Sacral plexus
Inferior gemellus	Laterally rotates and abducts thigh at hip joint	Sacral plexus

ARTERIES OF THE GLUTEAL REGION

There are three arteries coming into the gluteal region through the greater sciatic foramen:

1. superior gluteal artery
2. inferior gluteal artery
3. internal pudendal artery

These arteries are branches of the internal iliac artery which lies inside the pelvis.

LOWER LIMB

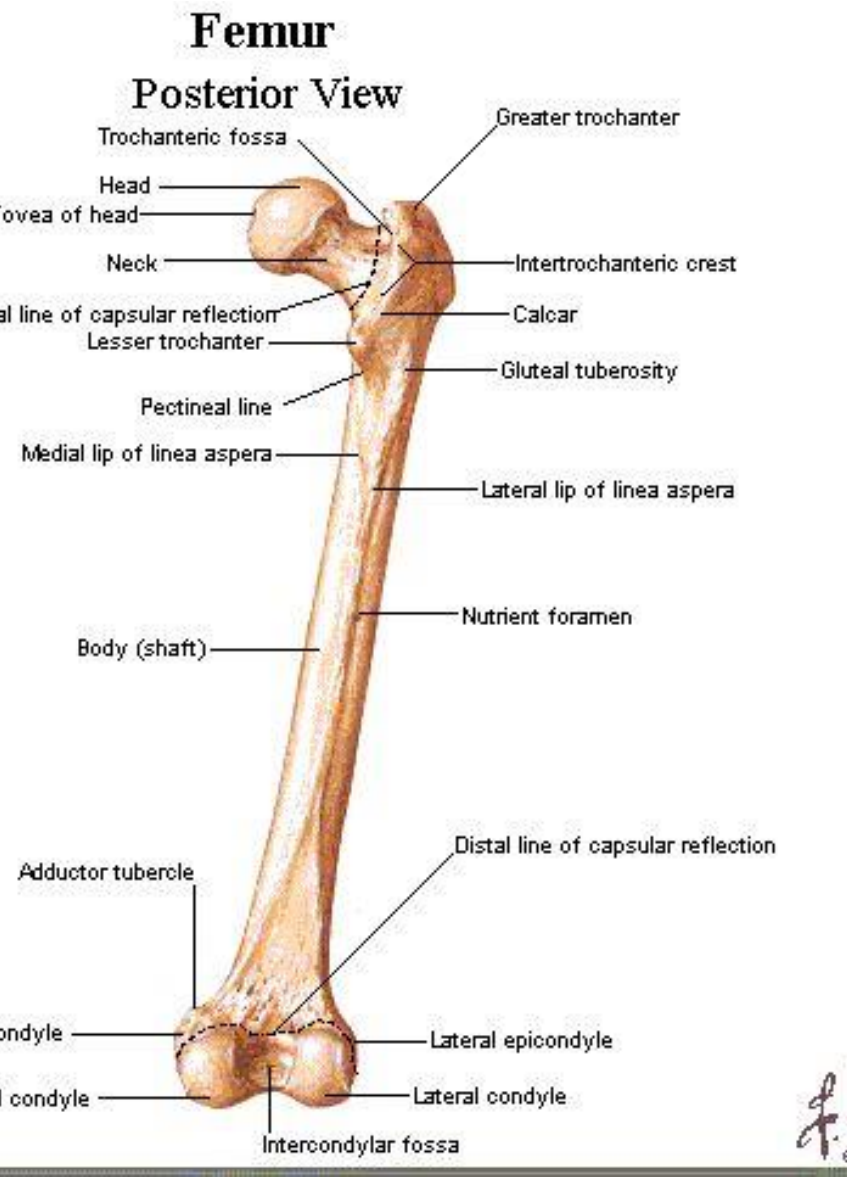
Each lower limb (extremity) has 30 bones in four locations- (1) the femur in the thigh; (2) the patella (kneecap); (3) the tibia and fibula in the leg; (4) the 7 tarsals in the tarsus (ankle), the 5 metatarsals in the metatarsus, and the 14 phalanges (bones of the digits) in the foot.

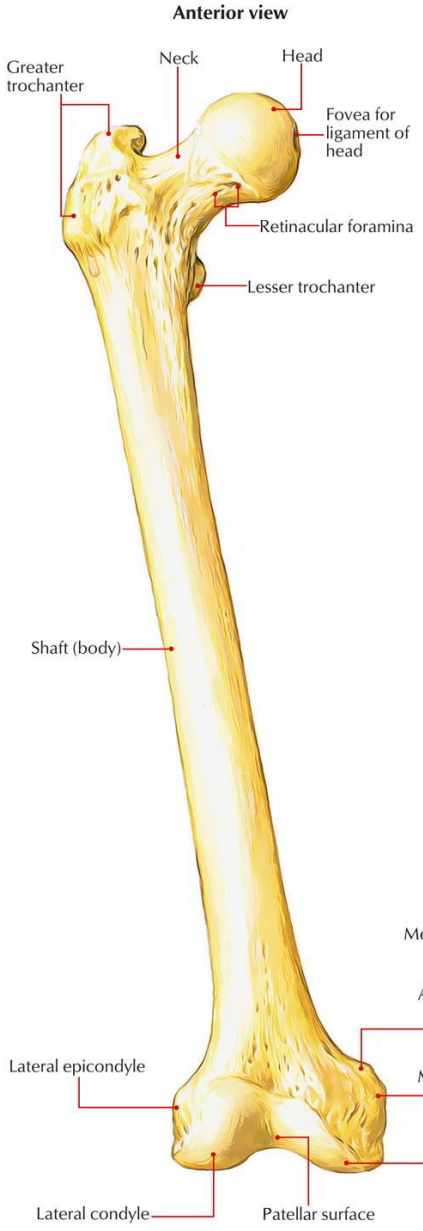
FEMUR

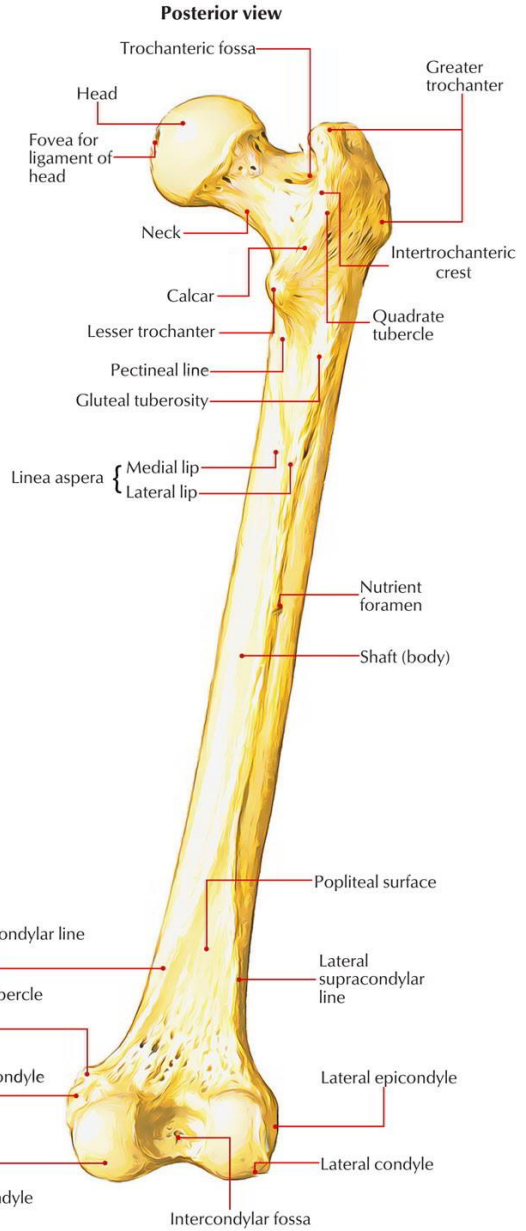
The femur, or thigh, is the longest, heaviest, and strongest bone in the body. Its proximal end articulates with the acetabulum of the hip bone. Its distal end articulates with the tibia and patella. The body (shaft) of the femur angles medially and, as a result, the knee joints are closer to the midline. The angle is greater in females because the female pelvis is broader.

The proximal end of the femur consists of a rounded head that articulates with the acetabulum of the hip bone to form the hip (coxal) joint. The head contains a small centered depression (pit) called the fovea capitis. The ligament of the head of the femur connects the fovea capitis of the femur to the acetabulum of the hip bone. The neck of the femur is a constricted region distal to the head. The greater trochanter and lesser trochanter are projections that serve as points of attachment for the tendons of some of the thigh and buttock muscles. The greater trochanter is the prominence felt and seen anterior to the hollow on the side of the hip. It is a landmark commonly used to locate the site for intramuscular injections into the lateral surface of the thigh.

The lesser trochanter is inferior and medial to the greater trochanter. Between the anterior surfaces of the trochanters is a narrow intertrochanteric line. A ridge called the intertrochanteric crest appears between the posterior surfaces of the trochanters.
Inferior to the intertrochanteric crest on the posterior surface of the body of the femur is a vertical ridge called the gluteal tuberosity. It blends into another vertical ridge called the linea aspera. Both ridges serve as attachment points of the tendons of several thigh muscles.
The distal end of the femur expands to include the medial condyle and lateral condyle. These articulate with the medial and lateral condyles of the tibia. Superior to the condyles are the medial epicondyle and the lateral epicondyle, to which ligaments of the knee joint attach. A depressed area between the medial and lateral condyles on the posterior surface is called the intercondylar fossa (notch). The patellar surface is located between the condyles on the anterior surface.


Femur
Posterior View
Trochanteric fossa
Greater trochanter
Head
ovea of head
Neck
Intertrochanteric crest
l line of capsular reflection
Calcar
Lesser trochanter
Gluteal tuberosity
Pectineal line
Medial lip of linea aspera
Lateral lip of linea aspera
Nutrient foramen
Body (shaft)
Distal line of capsular reflection
Adductor tubercle
ondyle
Lateral epicondyle
l condyle
Lateral condyle
Intercondylar fossa

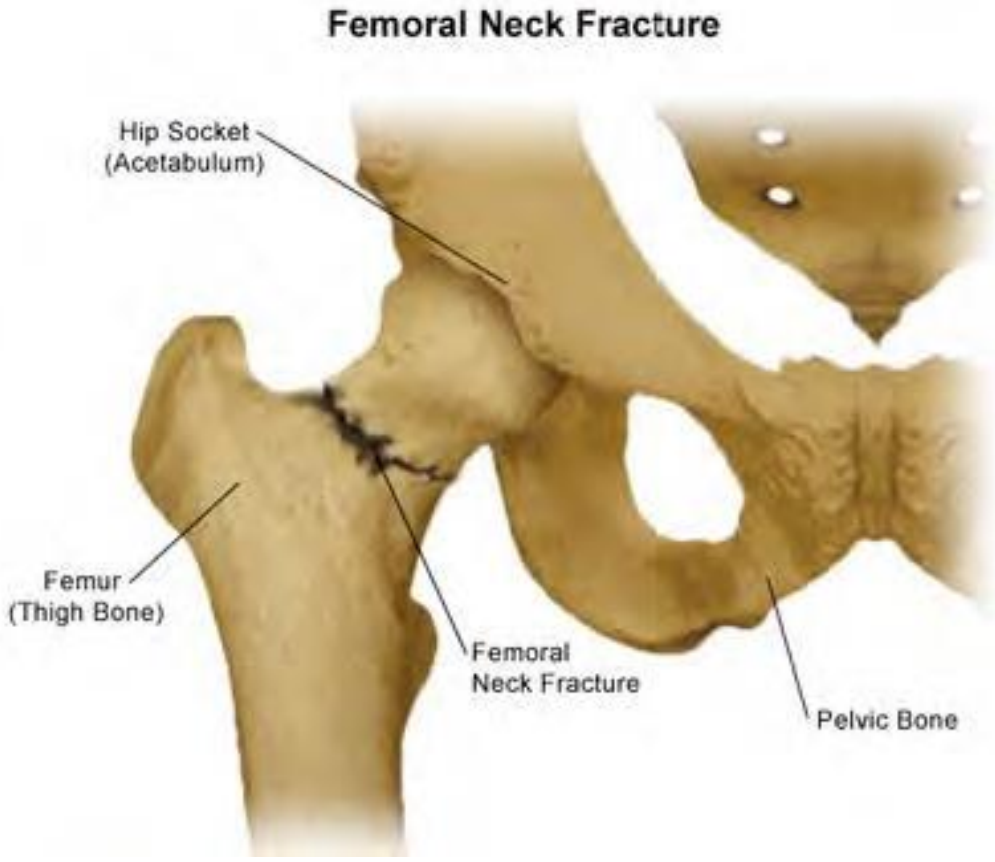

Anterior view
Greater trochanter
Neck
Head
Fovea for ligament of head
Retinacular foramina
Lesser trochanter
Shaft (body)
Lateral epicondyle
Lateral condyle
Patellar surface

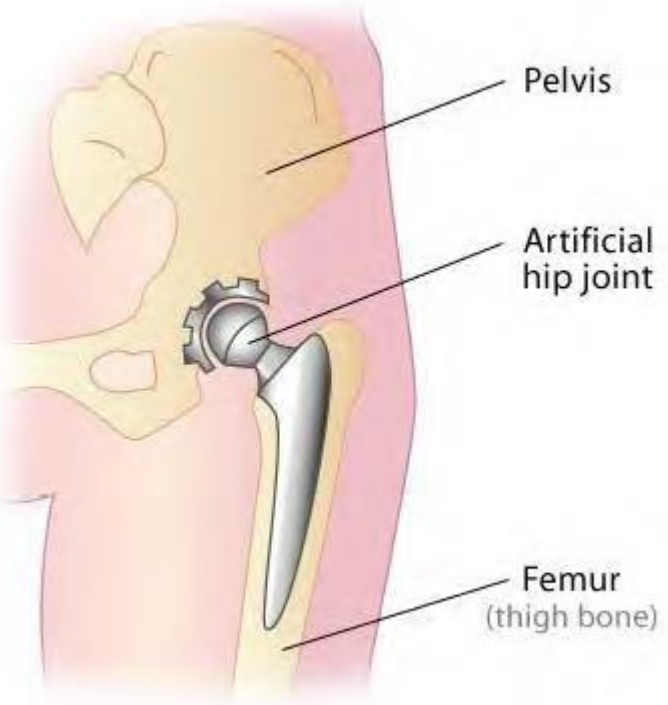

Posterior view
Trochanteric fossa
Greater trochanter
Head
Fovea for ligament of head
Neck
Intertrochanteric crest
Calcar
Quadrate tubercle
Lesser trochanter
Pectineal line
Gluteal tuberosity
Linea aspera
Medial lip
Lateral lip
Nutrient foramen
Shaft (body)
Popliteal surface
Medial supracondylar line
Lateral supracondylar line
Adductor tubercle
Medial epicondyle
Lateral epicondyle
Lateral condyle
Medial condyle
Intercondylar fossa

*** FRACTURE (#) NECK OF THE FEMUR**

"Avascular necrosis of head of the femur":

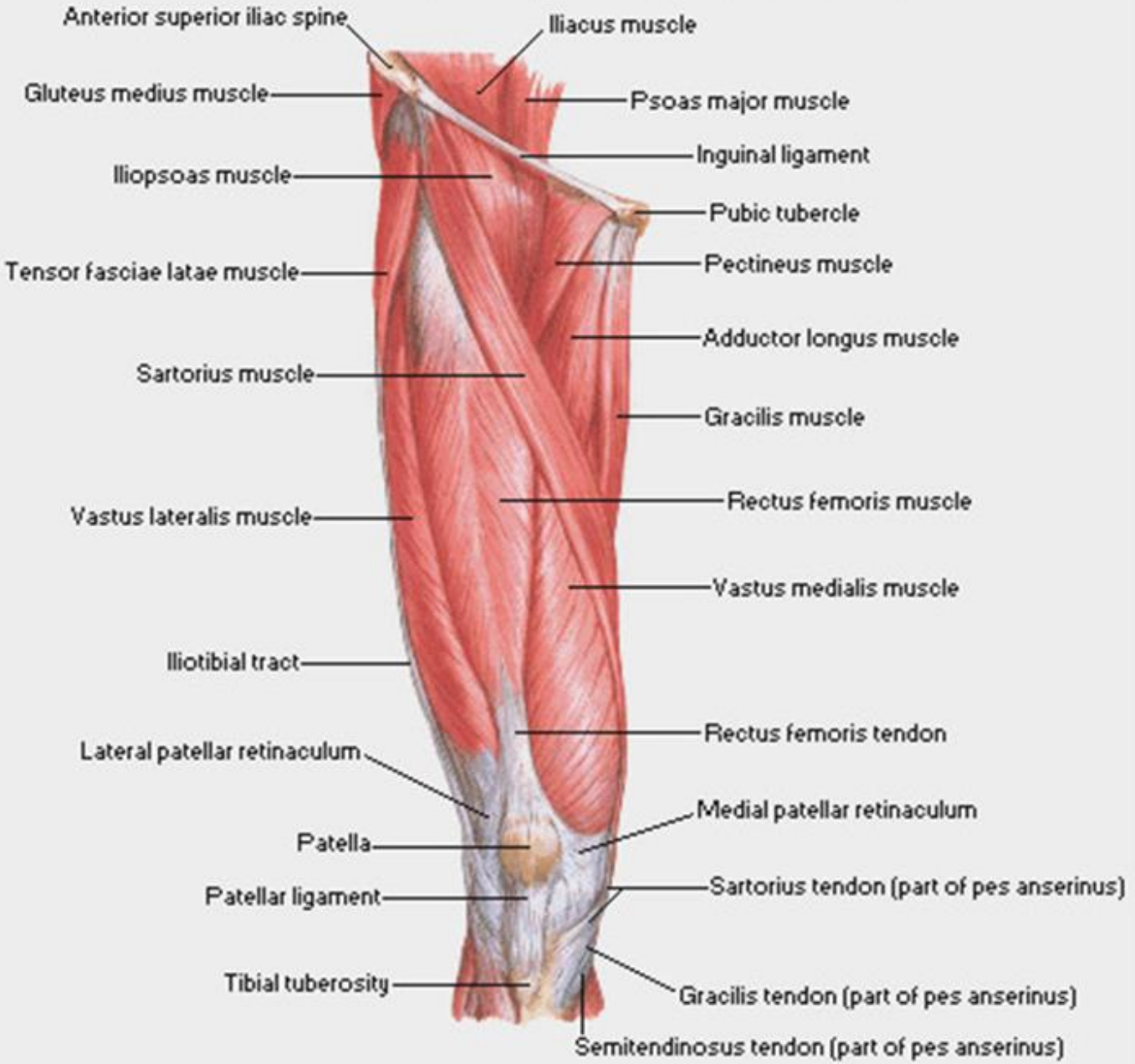
Fracture neck femur causes cutting of blood vessels to the head of femur and it's "death" leading to damage of hip joint.





Muscles of Thigh

Anterior View - Superficial Dissection



The quadriceps femoris muscle (also called the quadriceps extensor, quadriceps or quads) is a large muscle group that includes the four prevailing muscles on the front of the thigh(anterior). It is the great extensor muscle of the knee, forming a large fleshy mass which covers the front and sides of the femur. The name derives from Latin four-headed muscle of the femur.
It is subdivided into four separate portions or 'heads', which have received distinctive names:
Rectus femoris occupies the middle of the thigh, covering most of the other three quadriceps muscles. It originates on the ilium. It is named from its straight course.
The other three lie deep to rectus femoris and originate from the body of the femur, which they cover from the trochanters to the condyles:
Vastus lateralis is on the lateral side of the femur (i.e. on the outer side of the thigh).
Vastus medialis is on the medial side of the femur (i.e. on the inner part thigh).
Vastus intermedius lies between vastus lateralis and vastus medialis on the front of the femur (i.e. on the top or front of the thigh), but deep to the rectus femoris. Typically, it cannot be seen without dissection of the rectus femoris.
All four parts of the quadriceps muscle ultimately insert into the tuberosity of the tibia via the patella, where the quadriceps tendon becomes the patellar ligament.

Nerve supply: Femoral nerve (L2, L3, L4).
Function: All four quadriceps are powerful extensors of the knee joint. They are crucial in walking, running, jumping and squatting. Because the rectus femoris attaches to the ilium, it is also a flexor of the hip. This action is also crucial to walking or running as it swings the leg forward into the ensuing step. The quadriceps, specifically the vastus medialis, play the important role of stabilizing the patella and the knee joint during gait