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Assignment for viva.

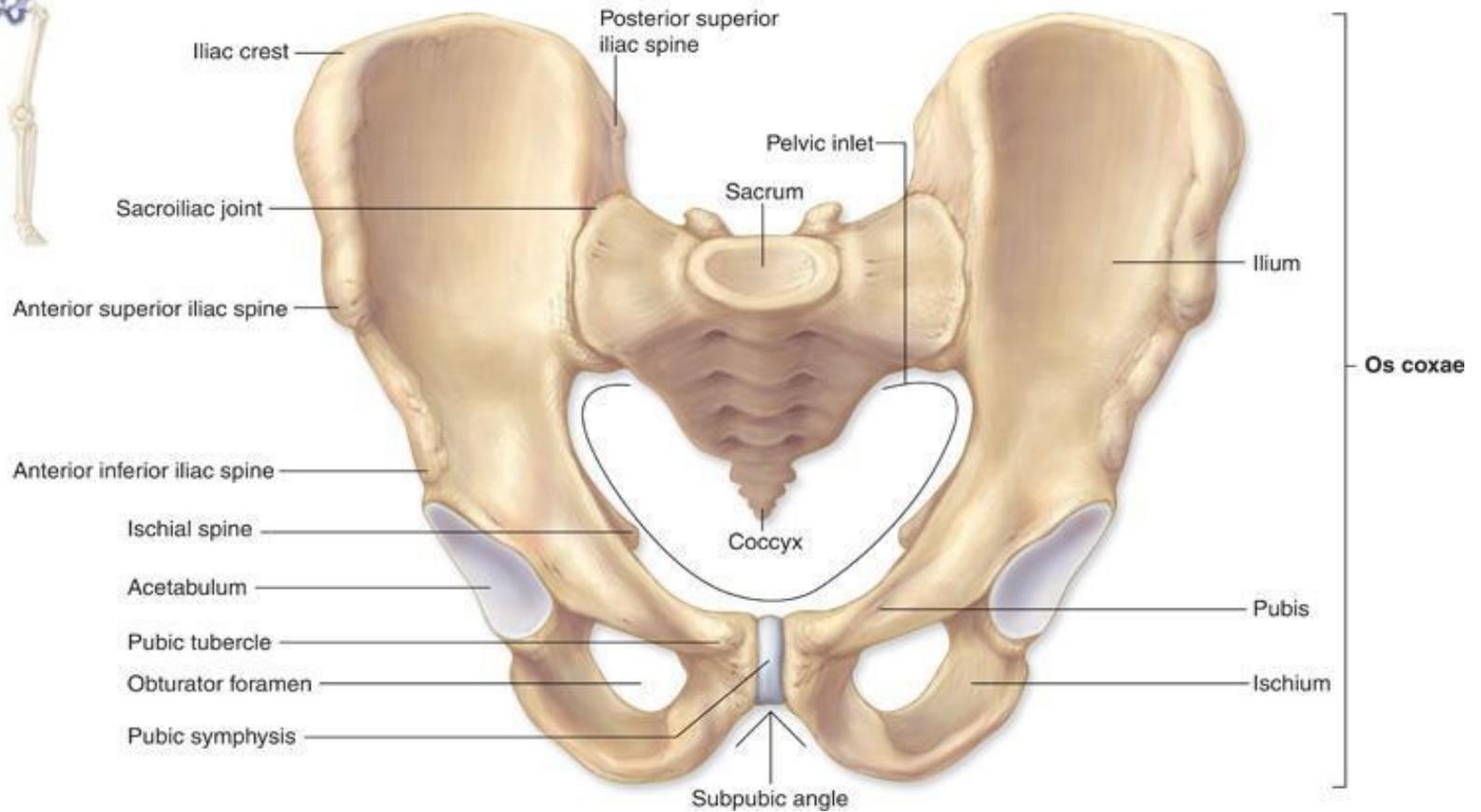
Question :

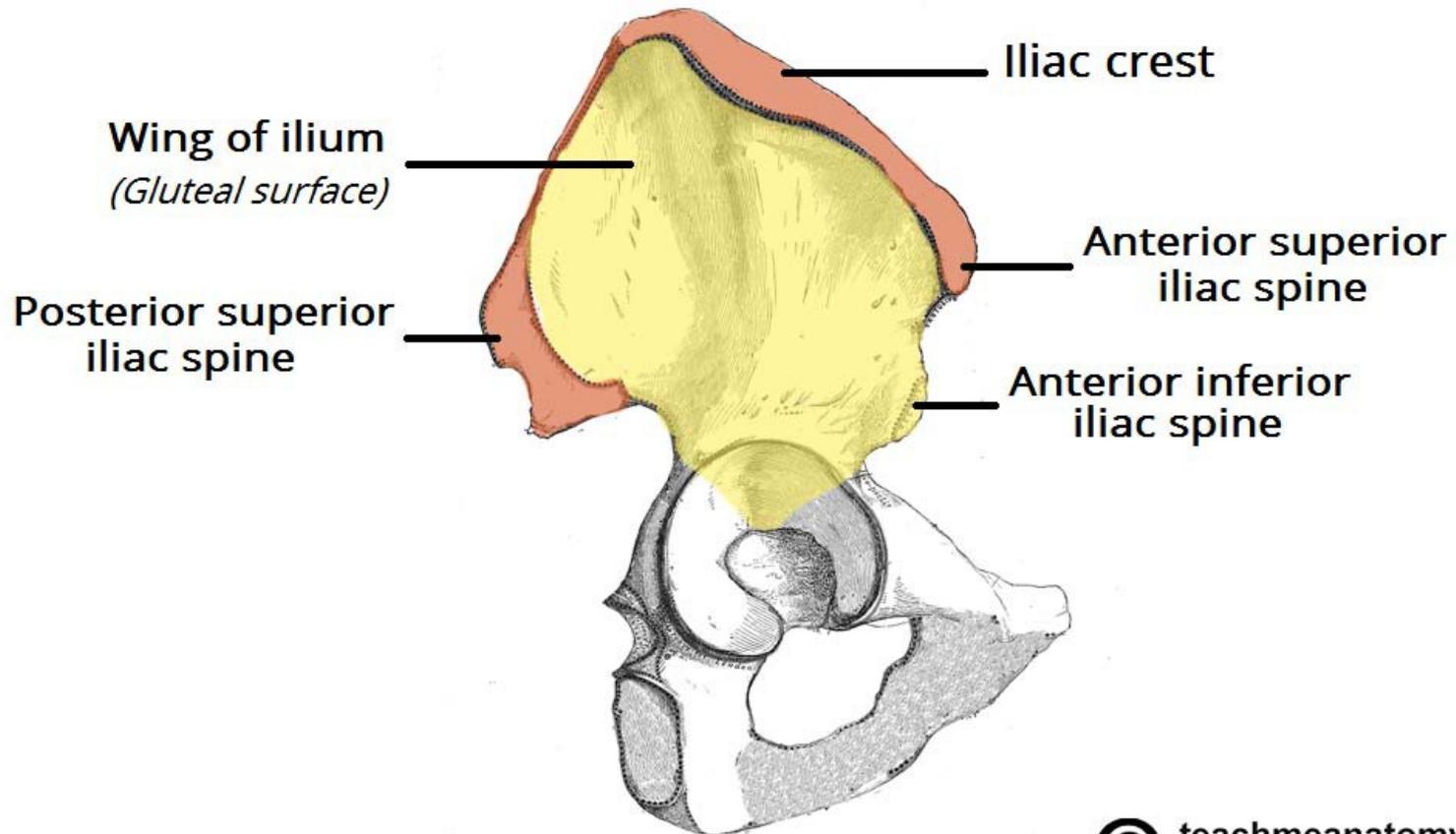
Write a complete note on hip joint ?

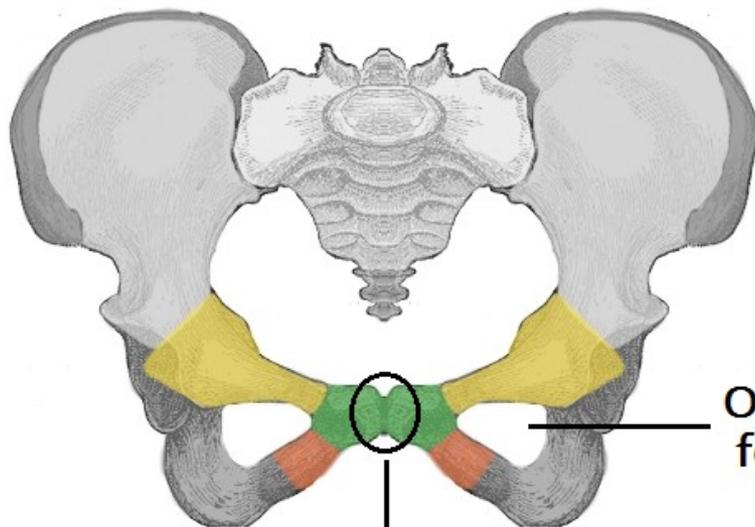


ANATOMY OF HIP JOINT

Osteology





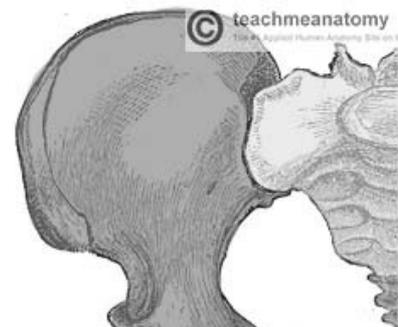


-  Body
-  Superior Rami
-  Inferior Rami

Obturator foramen

Pubic symphysis

 **teachmeanatomy**
The #1 Applied Human Anatomy Site on the Web.

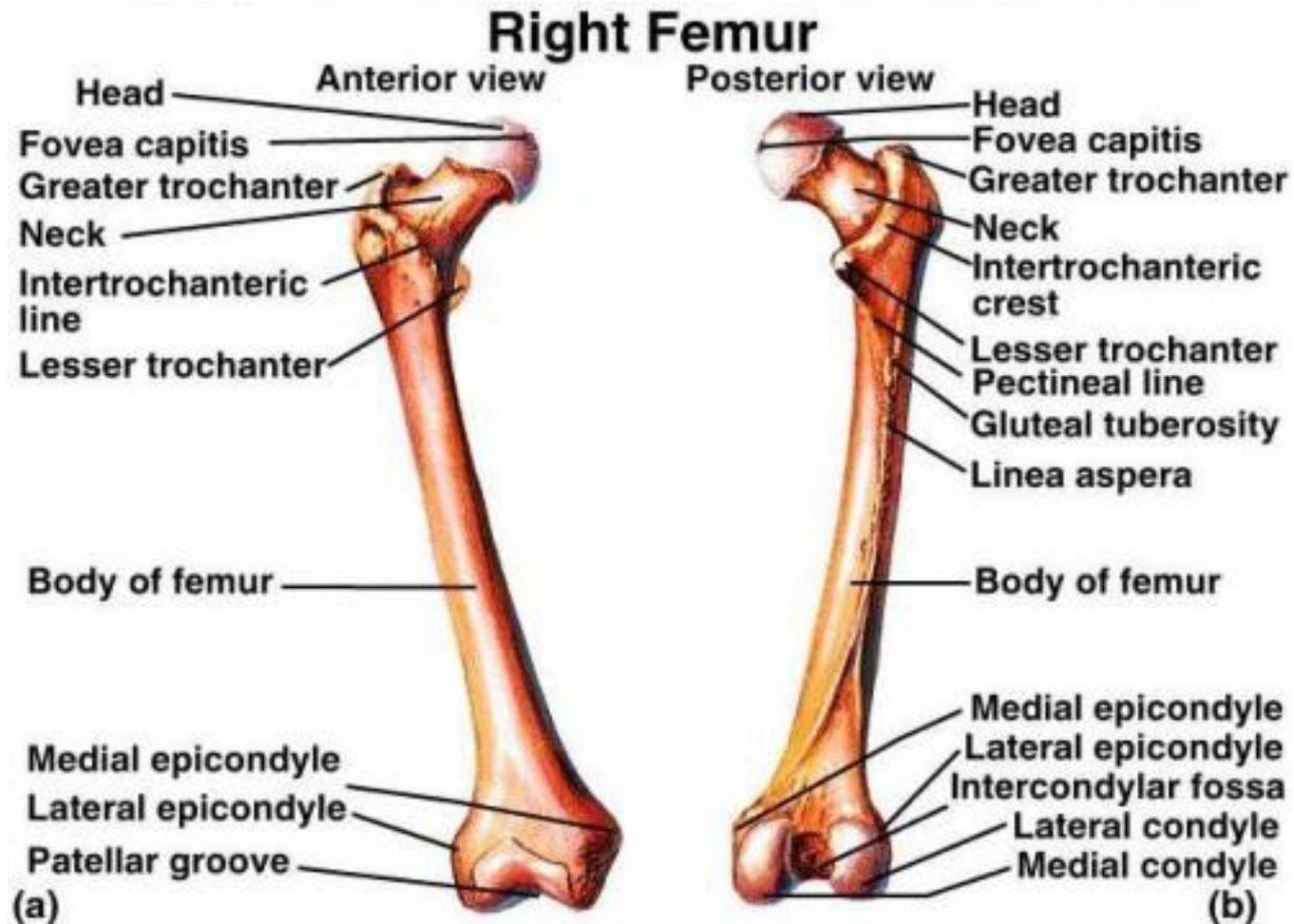


Superior ischial ramus

Body of ischium

Inferior ischial ramus

Femur



Hip joint

- Largest synovial joint
- Most proximal in lower limb
- Ball & socket joint
- Triaxial joint- allows 3D movements –degrees of freedom=3
- Convex femoral head articulates in concave acetabulum
- Weight bearing - Stable joint
- In the anatomical position, the anterior/superior part of the femoral head is not covered by the acetabulum.*

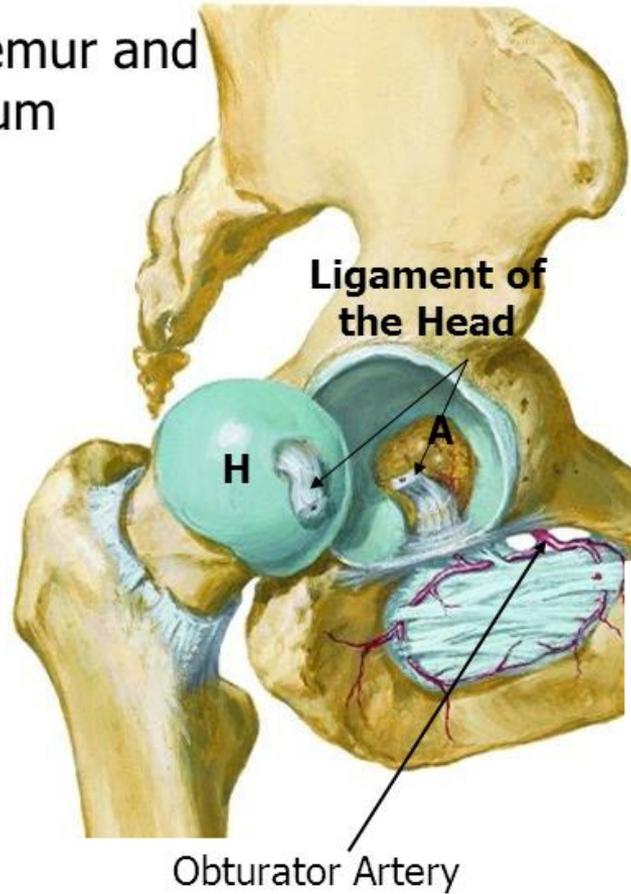
The Acetabulum

- The cup-shaped acetabulum is a little below the middle third of the inguinal ligament.
- The acetabular articular surface is an incomplete cartilaginous ring, thickest and broadest above, where the pressure of body weight falls in the erect posture, narrowest in the pubic region.
- The rough lower part of the cup, the acetabular notch, is not covered by cartilage.
- The center of the cup, the acetabular fossa, is also devoid of cartilage but contains fibro elastic fat.
- The acetabular labrum, a fibro cartilaginous ring attached to the acetabular rim, deepens the cup and enlarges the contact area with the femoral head.
- The transverse acetabular ligament covers the acetabular notch and makes a foramen for vessels and nerves.

Plate 487C

Hip Joint (Opened) Lateral View

Note head of femur and
acetabulum



Hip Joint

Ligamentum of the Head:

can be an important
blood supply to head
of femur-
branch of Obturator
artery



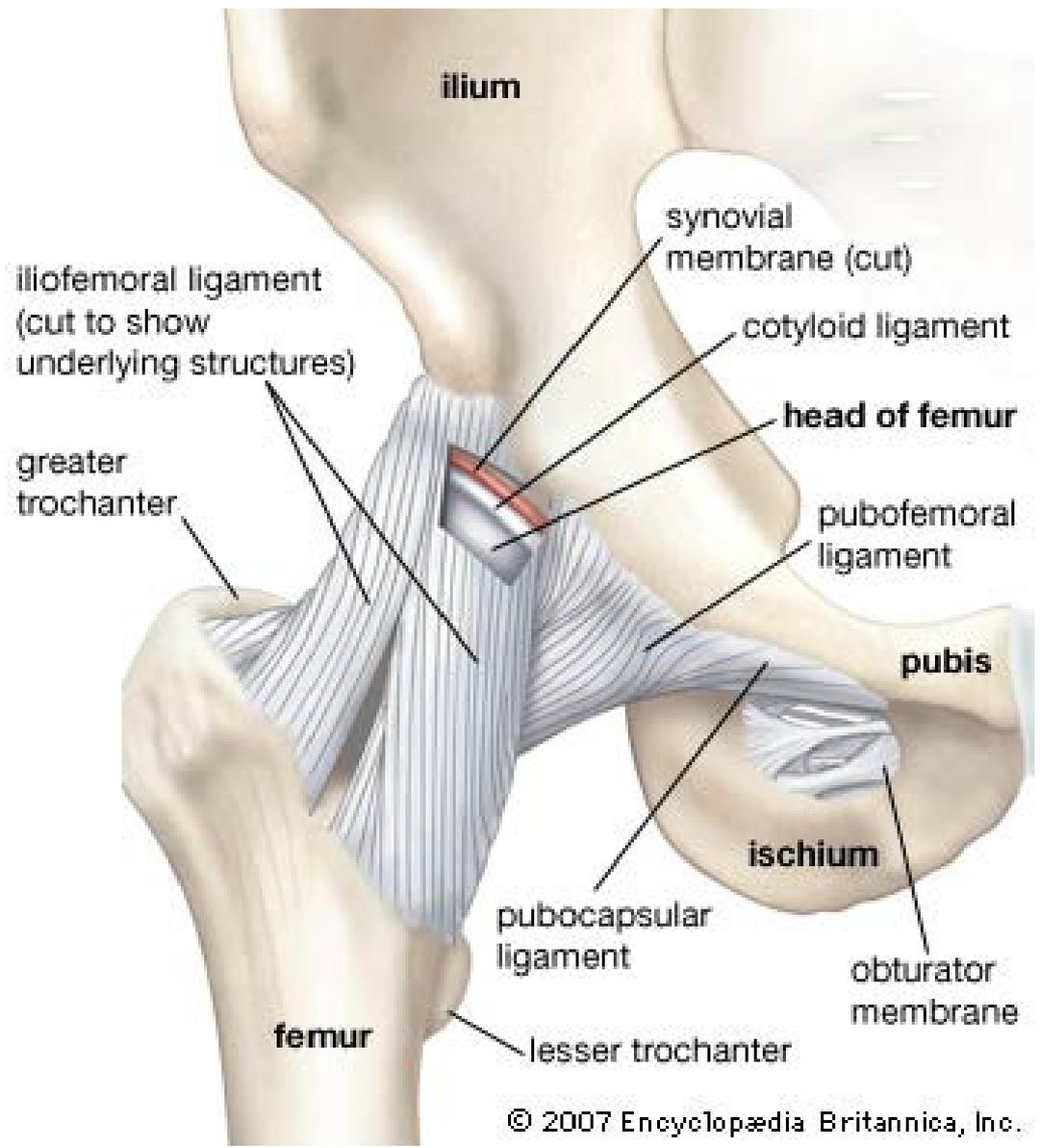
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Supporting Structures

- Supporting Structures located within the hip joint
- Transverse acetabular ligament: spans acetabular notch, completing the “cup” of the acetabulum
- Acetabular labrum: a ring of fibrocartilage surrounding the outer rim of the acetabulum, which deepens the socket and “seals” the joint
- Articular cartilage: acts as a shock absorber

Capsule and ligaments

- The capsule is a cylindrical sleeve, running from the acetabular rim to the base of the femoral neck.
- It is supported by powerful ligaments. Anteriorly these are two ligaments:
 - The iliofemoral ligament of Bertin &
 - The pubofemoral ligament, Together they resemble the letter Z.
- Posteriorly the capsule is strengthened by ischiofemoral ligament.
- All the 3 ligaments are coiled up around the femoral head.



Hip joint movements

- **Osteokinematics:**

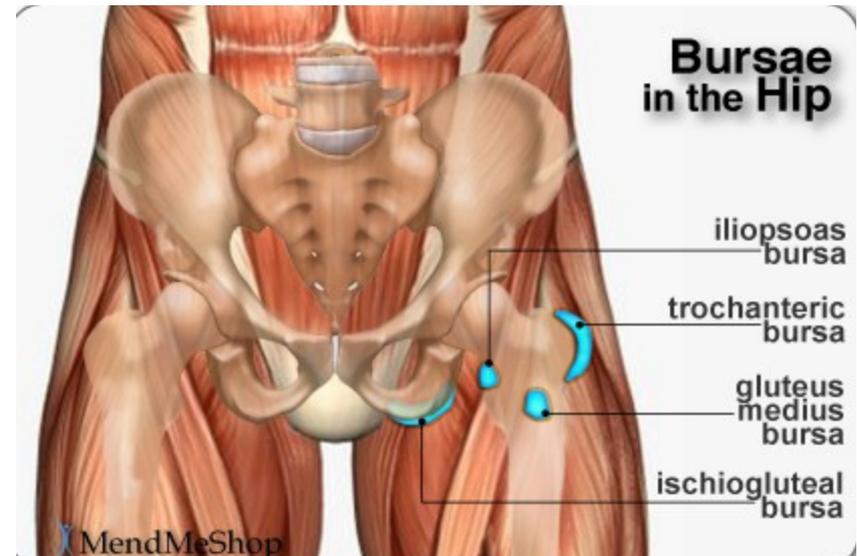
- Sagittal plane = flexion, extension, hyperextension
- Frontal plane = abduction, adduction
- Transverse plane = internal and external rotation

- **Arthrokinematics:**

- Extension 'winds up' and tautens the ligaments, thus stabilizing the joint passively.
- Flexion slackens them.
- Lateral rotation tightens the iliofemoral ligament and also the pubofemoral ligament.
- Medial rotation tightens the ischiofemoral ligament.
- Abduction tightens the pubofemoral and the ischiofemoral ligaments.
- Adduction tightens the lateral part of the iliofemoral ligament.
- The ligamentum teres plays only a minor role in the control of hip movements. Adduction from a semi-flexed position is the only movement where this ligament is under tension.

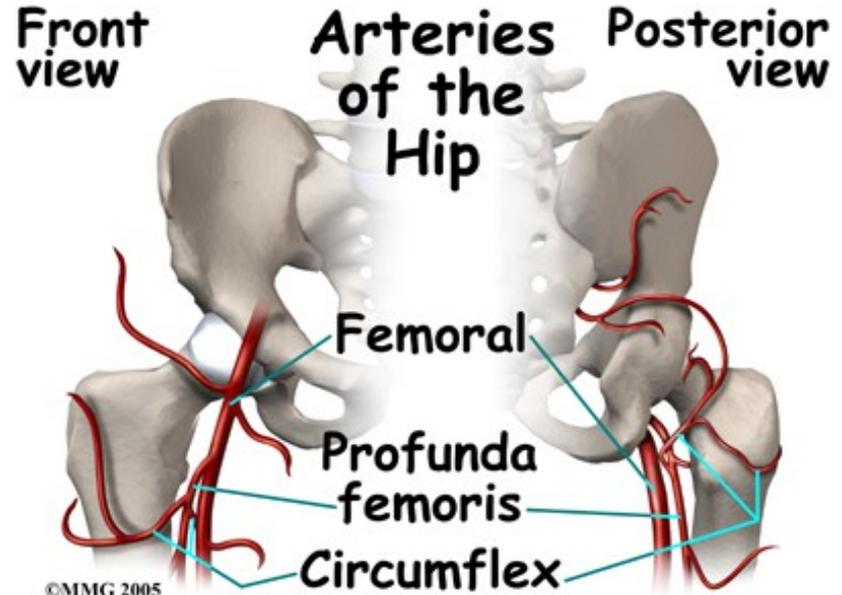
Bursae *

- There are as many as 20 bursae around the hip. Inflammation or infection of the bursa is called bursitis.
- The greater trochanteric bursa is located between the greater trochanter (the bony prominence on the femur) and the muscles and tendons that cross over the greater trochanter.
- This bursa can get irritated if the iliotibial band is too tight.
- Two other bursa that can get inflamed are the iliopsoas bursa, located under the iliopsoas muscle and the bursa located over the ischial tuberosity (the bone you sit



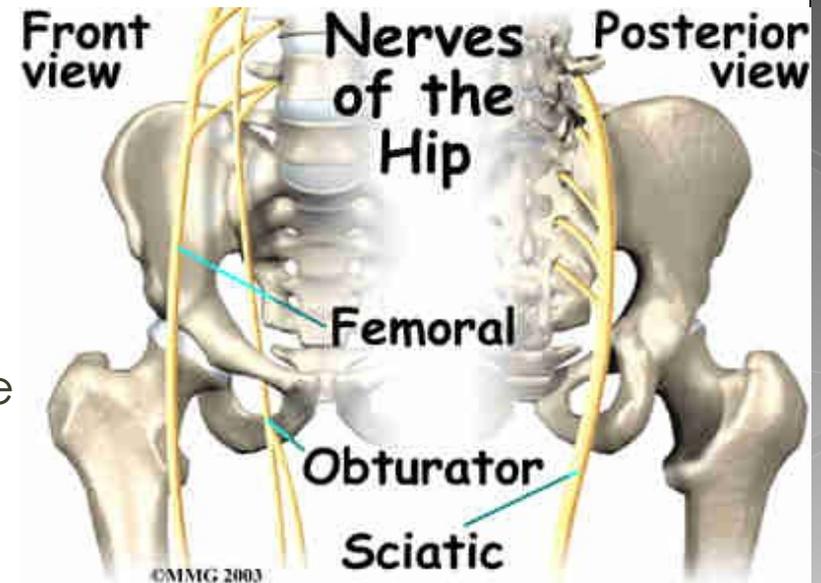
Blood Supply

- The blood supply to the hip is primarily from the internal and external iliac, femoral, obturator, and superior and inferior gluteal arteries.
- The femoral artery is well-known because of its use in **cardiac cath**; it travels from deep within the hip down the leg to the knee.



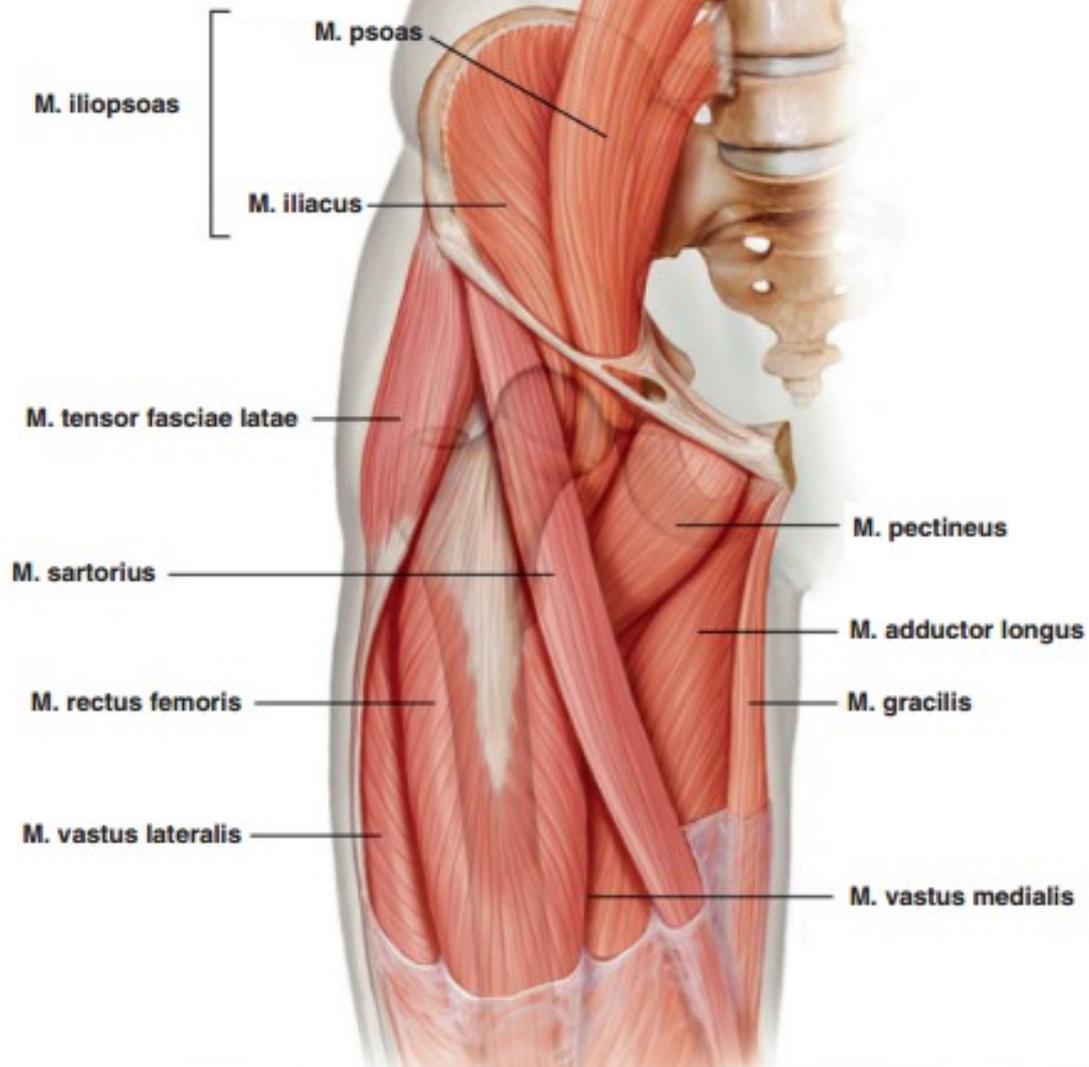
Nerve Supply

- The nerve supply of hip is by femoral nerve, lateral femoral cutaneous nerve, and obturator nerve.
- The obturator nerve is also responsible for sensation over the thigh. The sciatic nerve is the most commonly recognized nerve in the hip and thigh.
- The sciatic nerve is large—as big around as your thumb—and travels beneath the gluteus Maximus down the back of the leg and then branches on down to the foot.
- Hip dislocation can cause injury to the sciatic nerve.



Muscles of Hip joint

- The hip joint is surrounded by a large number of muscles.
- According to their function these are divided into 6 groups:
 1. Flexors,
 2. Extensors,
 3. Abductors,
 4. Adductors,
 5. Lateral Rotators,
 6. Medial Rotators
- On the basis of location they are divided into;
 - Anterior, posterior and medial.



Major hip flexors

Table 1 Flexor muscles

| Muscle | Innervation | |
|----------------------|---------------------------|--------|
| | Peripheral nerve | Spinal |
| Iliopsoas* | Femoral and lumbar plexus | L2, L3 |
| Sartorius* | Femoral | L2, L3 |
| Rectus femoris* | Femoral | L3 |
| Tensor fasciae latae | Superior gluteal | L5 |
| Pectineus | Femoral and obturator | L2, L3 |
| Adductor longus* | Obturator | L2, L3 |
| Adductor brevis | Obturator | L2, L3 |
| Adductor magnus | Obturator and sciatic | L3, L4 |
| Gluteus medius | Superior gluteal | L5 |
| Gluteus minimus | Superior gluteal | L5 |

*Clinically important muscles.

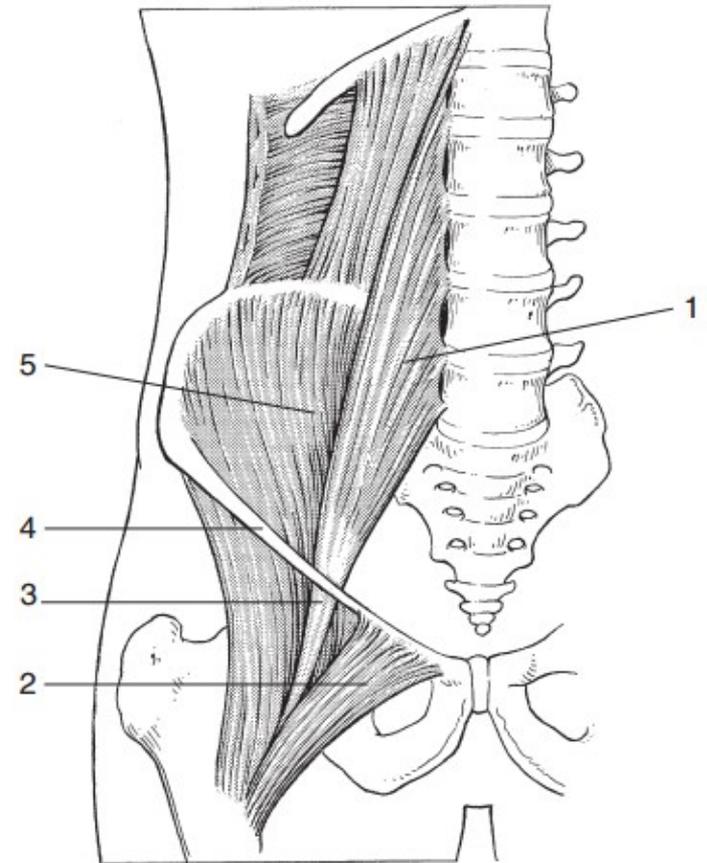


Fig 6 • The iliopsoas and associated structures: 1, psoas; 2, pectineus; 3, iliopsoas tendon; 4, inguinal ligament; 5, iliacus.

Table 2 Extensor muscles

| Muscle | Innervation | |
|------------------|------------------|-----------|
| | Peripheral nerve | Spinal |
| Gluteus maximus* | Inferior gluteal | Mainly S1 |
| Semimembranosus | Sciatic | S1, S2 |
| Semitendinosus | Sciatic | S1, S2 |
| Biceps femoris | Sciatic | S1, S2 |

*Clinically important muscle.

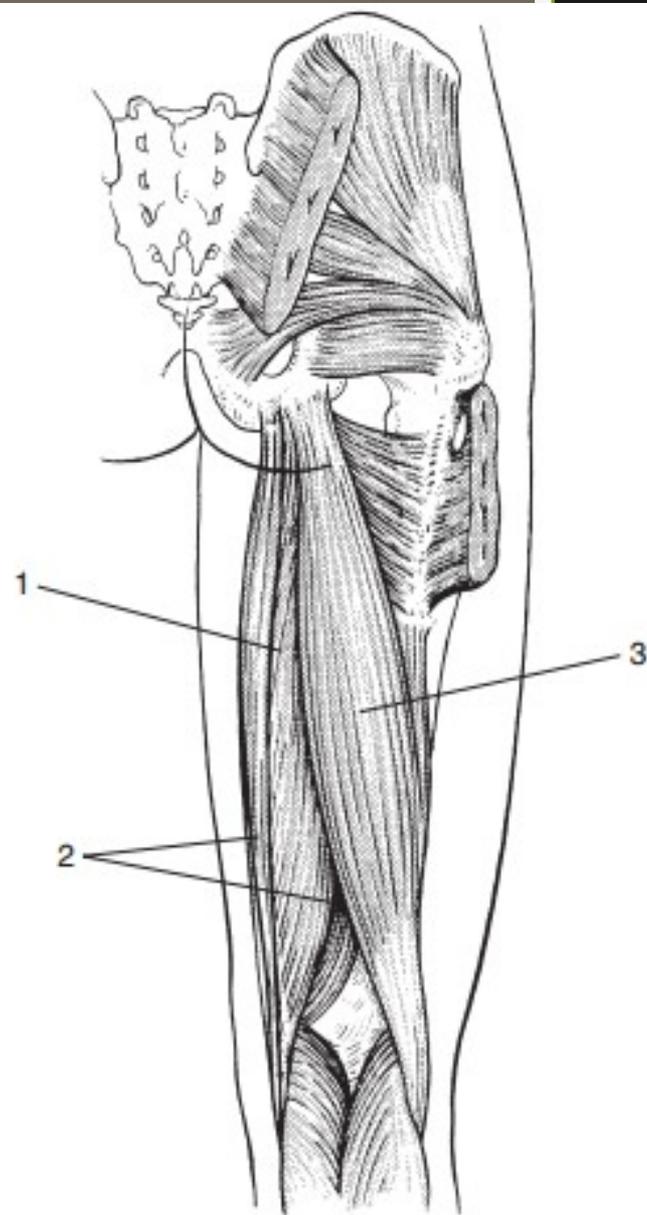
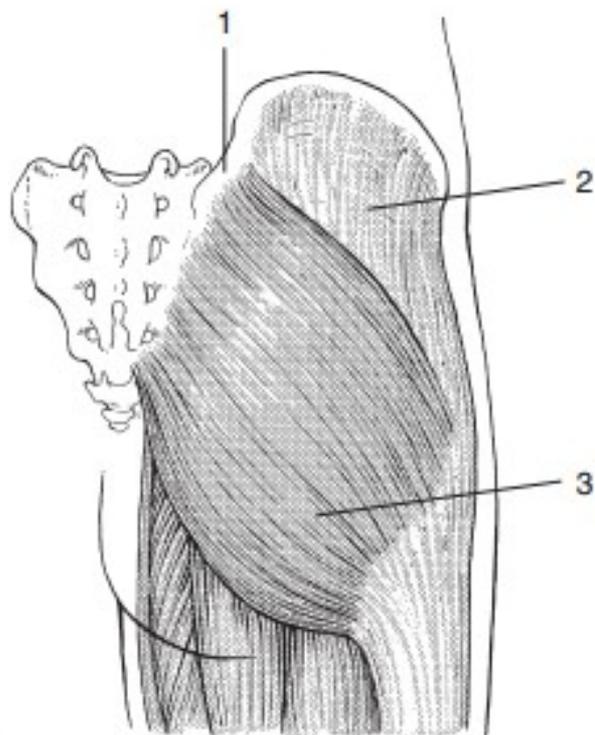


Fig 10 • Extensors of the hip (hamstrings): 1, semitendinosus; 2, semimembranosus; 3, biceps femoris.

Table 3 Abductor muscles

| Muscle | Innervation | |
|----------------------|--------------------|-----------|
| | Peripheral nerve | Spinal |
| Gluteus medius | Superior gluteal | L5 |
| Gluteus minimus | Superior gluteal | L5 |
| Tensor fasciae latae | Superior gluteal | L5 |
| Gluteus maximus | Inferior gluteal | Mainly S1 |

Table 4 Adductor muscles

| Muscle | Innervation | |
|--------------------|-----------------------|------------|
| | Peripheral nerve | Spinal |
| Adductor longus* | Obturator | L2, L3 |
| Adductor magnus | Obturator and sciatic | L3, L4 |
| Gracilis | Obturator | L2, L3, L4 |
| External obturator | Obturator | L3, L4 |
| Pectineus | Femoral and obturator | L2, L3 |
| Quadratus femoris | Sacral plexus | L4, L5, S1 |
| Semimembranosus | Sciatic | S1, S2 |
| Semitendinosus | Sciatic | S1, S2 |
| Biceps femoris | Sciatic | S1, S2 |

*Clinically important muscle.

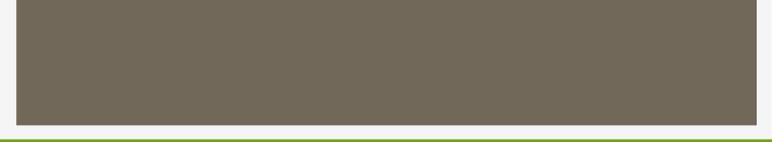
Table 6 Medial rotator muscles

| Muscle | Innervation | |
|----------------------|--------------------|--------|
| | Peripheral nerve | Spinal |
| Tensor fasciae latae | Superior gluteal | L5 |
| Gluteus medius | Superior gluteal | L5 |
| Gluteus minimus | Superior gluteal | L5 |
| Semimembranosus | Sciatic | S1, S2 |
| Semitendinosus | Sciatic | S1, S2 |

Table 5 Lateral rotator muscles

| Muscle | Innervation | |
|--------------------|-------------------------|---------------|
| | Peripheral nerve | Spinal |
| Quadratus femoris* | Sacral plexus | L4, L5, S1 |
| Piriformis | Sacral plexus | S1, S2 |
| Internal obturator | Sacral plexus | L5, S1, S2 |
| External obturator | Obturator | L3, L4 |
| Pectineus | Femoral/ obturator | L2, L3 |
| Adductor magnus | Obturator | L3, L4 |
| Gluteus medius | Superior gluteal | L4, L5, S1 |
| Gluteus maximus | Inferior gluteal | L5, S1, S2 |
| Biceps femoris | Sciatic | S1, S2 |
| Sartorius | Femoral | L2, L3 |
| Iliopsoas | Femoral | L2, L3 |

*Clinically important muscle.



Thank you