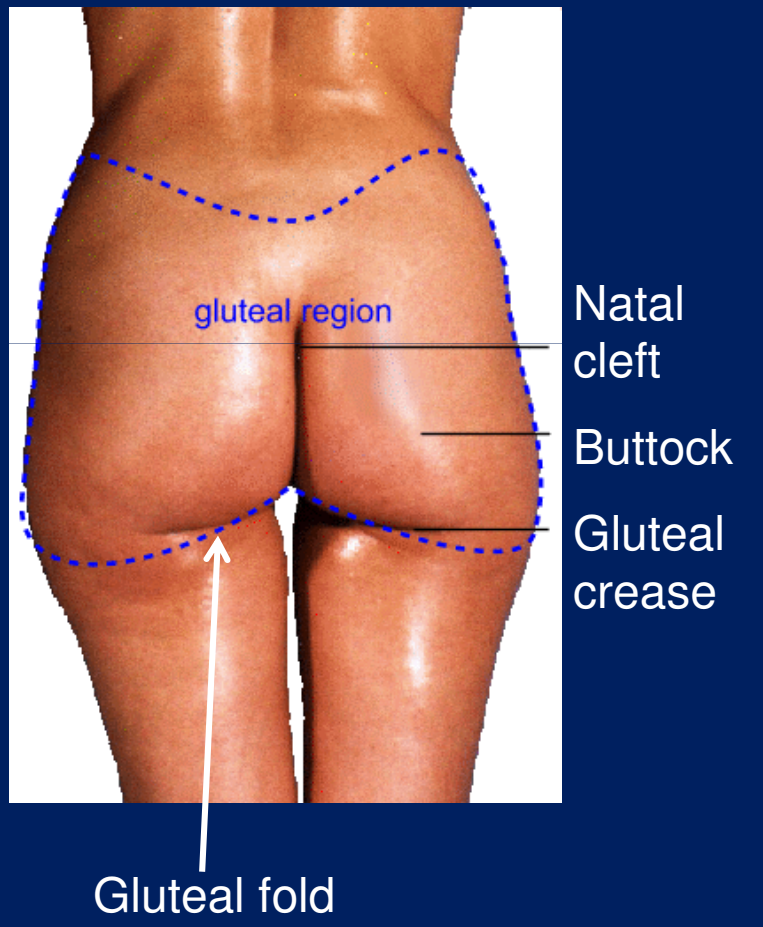
The Gluteal Region (Buttock)

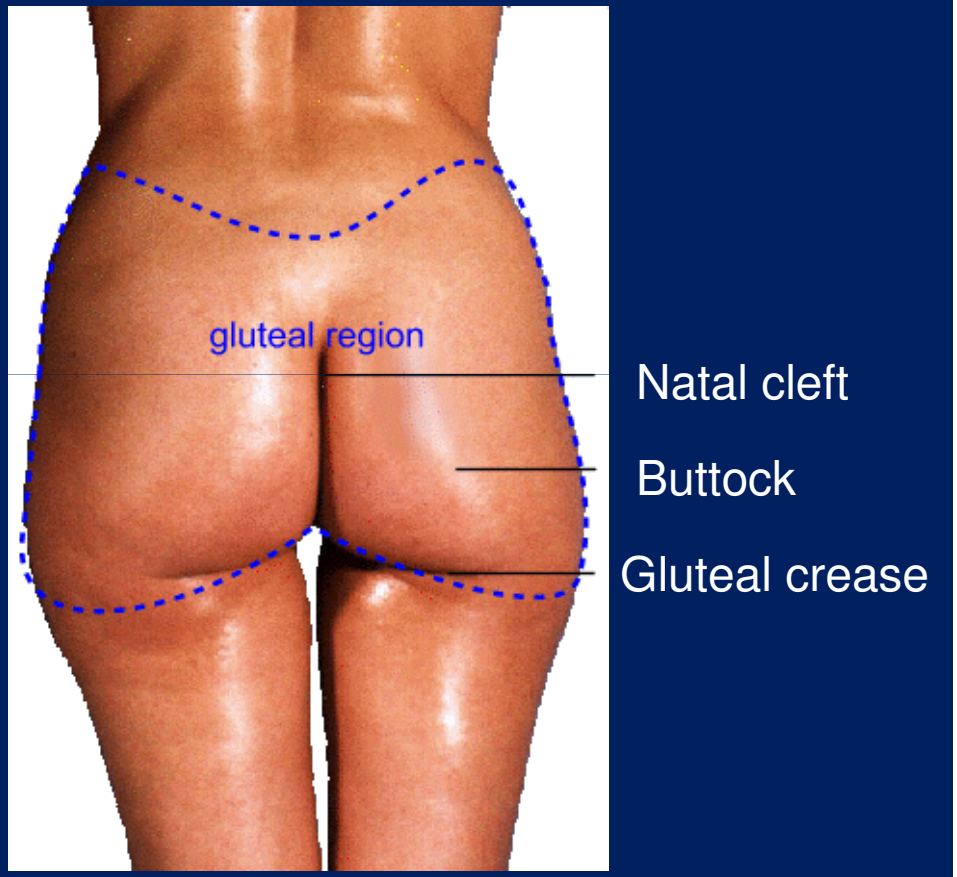
Gluteal Region

- It is the region behind the pelvis, extending from the iliac crest superiorly to the gluteal fold (fold of the buttock) inferiorly
- Gluteal fold indicates the lower border of the gluteus maximus muscle (gluteal sulcus/crease is a skin crease for the hip joint)
- A deep midline groove, the natal (intergluteal) cleft separates the buttocks from each other.



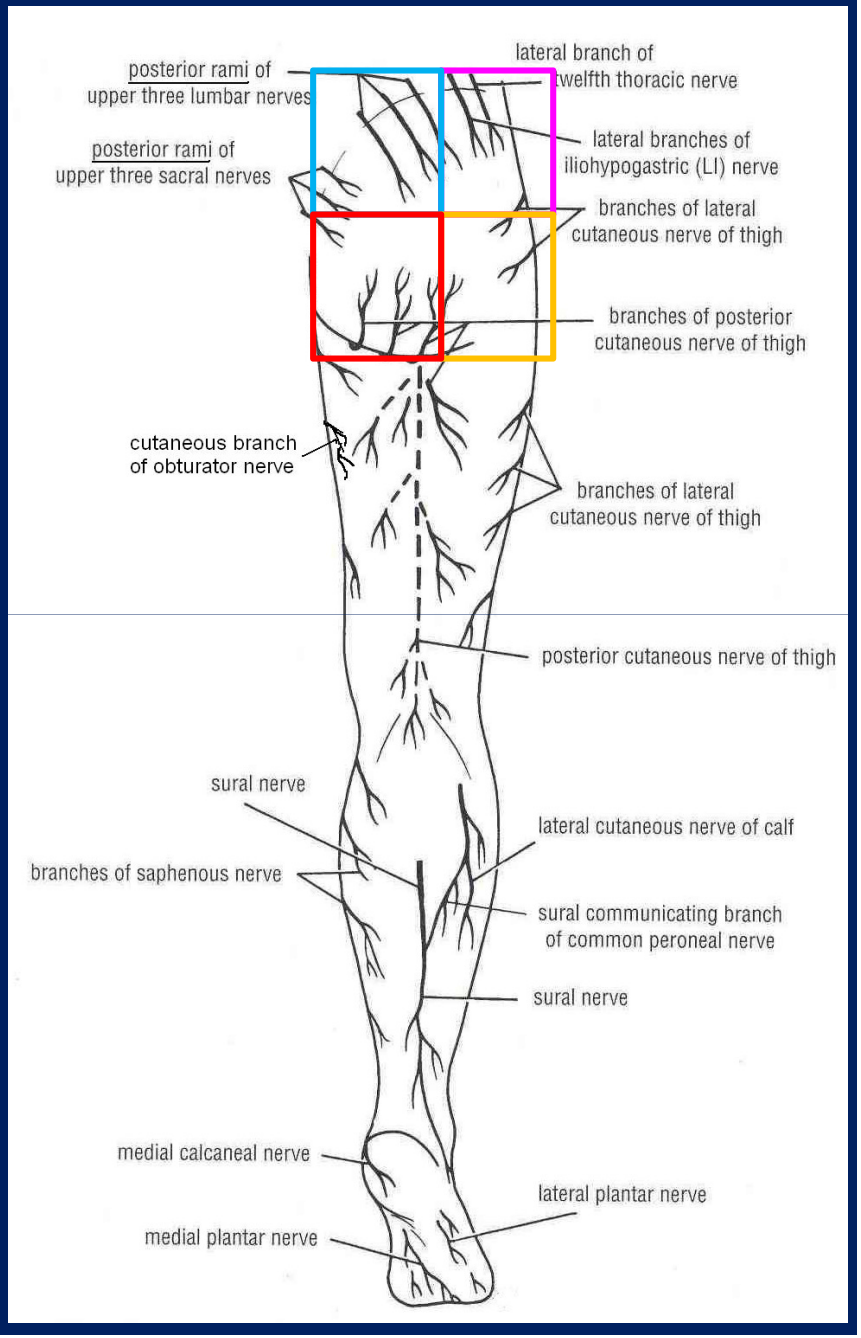
Superficial fascia

- Thick, dense, well developed, laden with large quantities of fat (specially in women) that:
  - Gives the characteristic convexity to the buttock
  - Forms a thick cushion over the ischial tuberosity

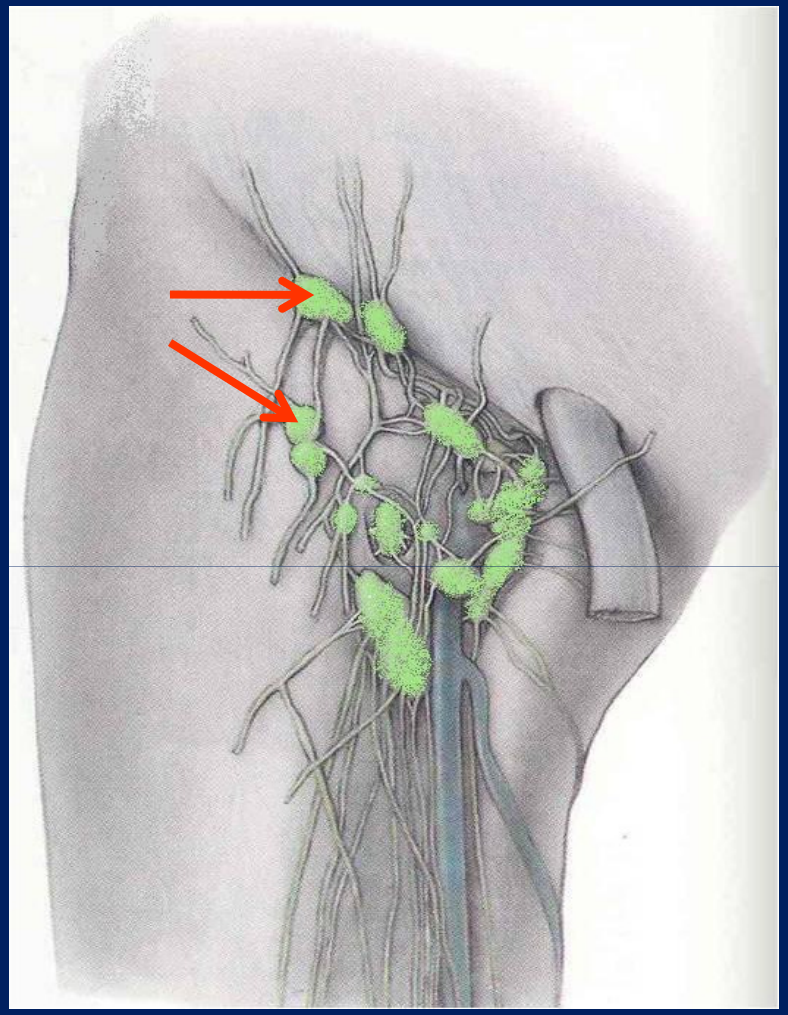


Cutaneous Nerve supply:

- **Upper lateral quadrant:**
  Lateral branches of iliohypogastric (L1) and T12.
- **Upper medial quadrant:**
  Posterior rami of L1,2,3 & S1,2,3.
- **Lower lateral quadrant:**
  branches from lateral cutaneous nerve of thigh (L2,3).
- **Lower medial quadrant:**
  branches from posterior cutaneous nerve of thigh (S1,2,3).
- **Skin in the floor of the natal cleft:**
  branches from lower sacral and coccygeal nerves.



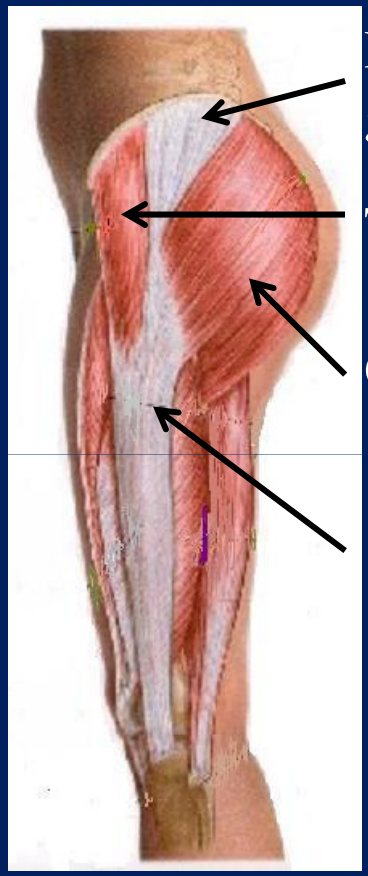
- The skin and the fat of the gluteal region is:
  - Supplied by perforating branches of the superior and inferior gluteal arteries
  - Drain into the lateral group of the superficial Inguinal lymph nodes



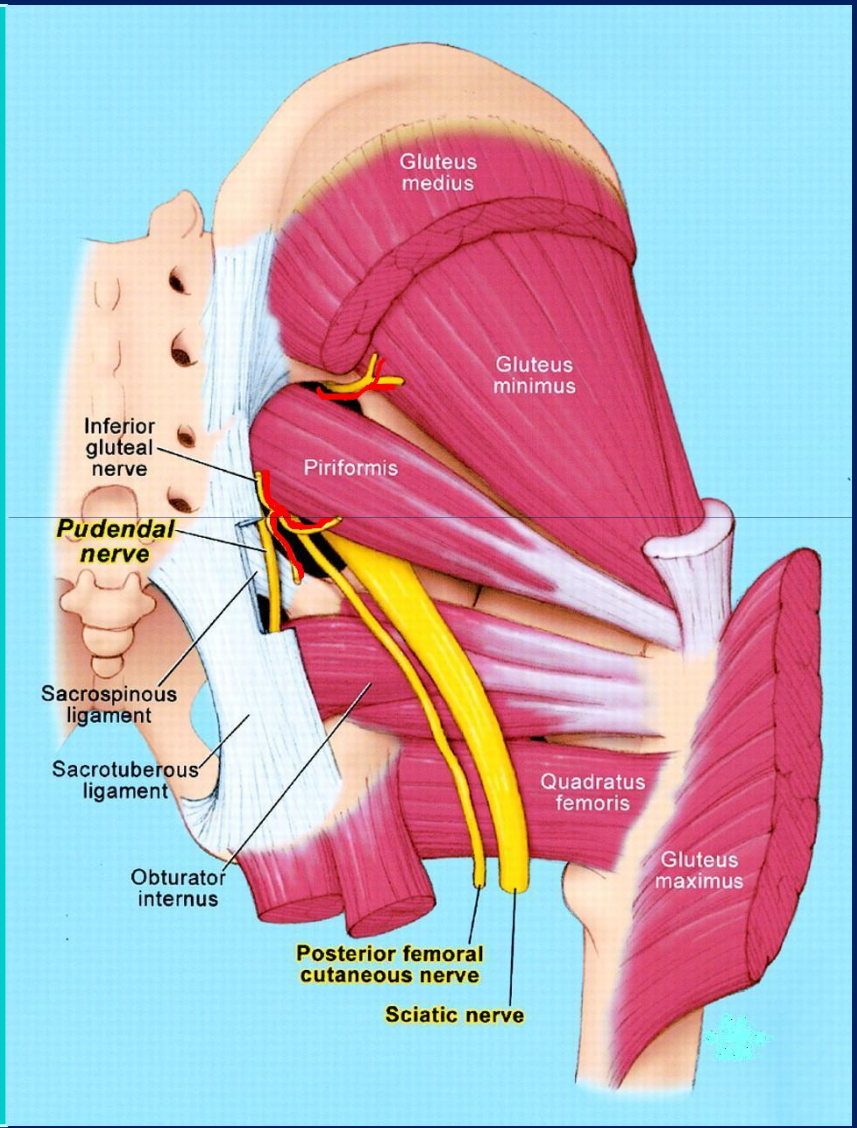
Superficial Inguinal lymph nodes

Deep Fascia

- Is continuation of the fascia lata (deep fascia of the thigh)
- At the lower border of the gluteus maximus, fascia lata splits to enclose the muscle
- Above the gluteus maximus, the deep fascia continues as one layer covering the gluteus medius & gets attached to iliac crest
- Laterally the fascia merges with the iliotibial tract



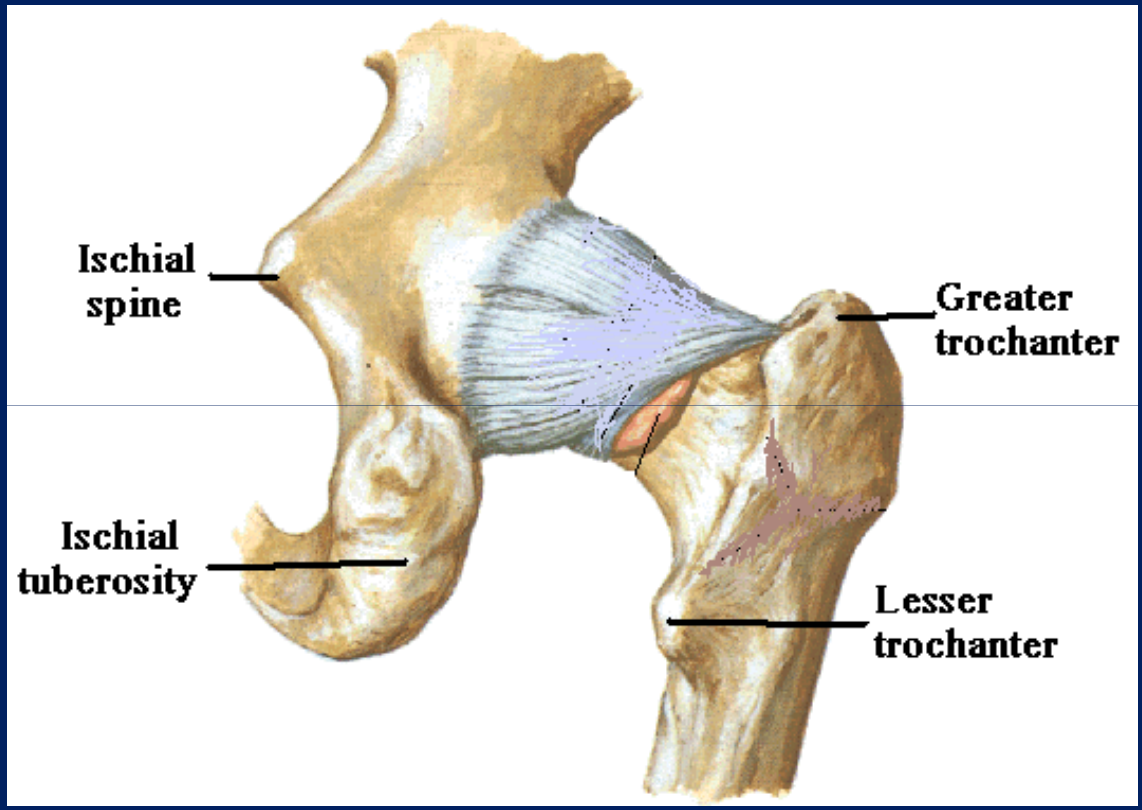
- The gluteal region contains:
  - Bones
  - Ligaments
  - Muscles
  - Vessels
  - Nerves

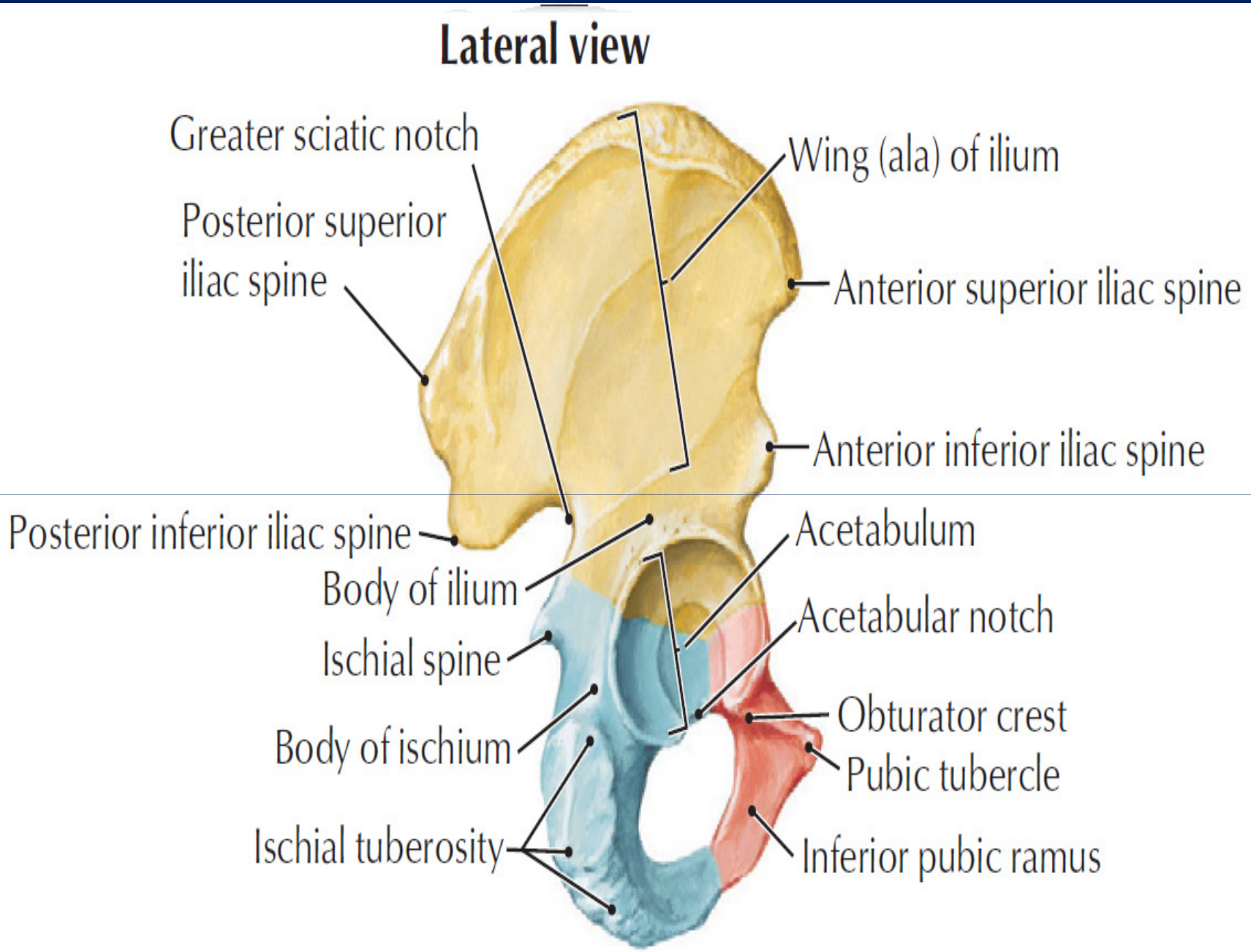


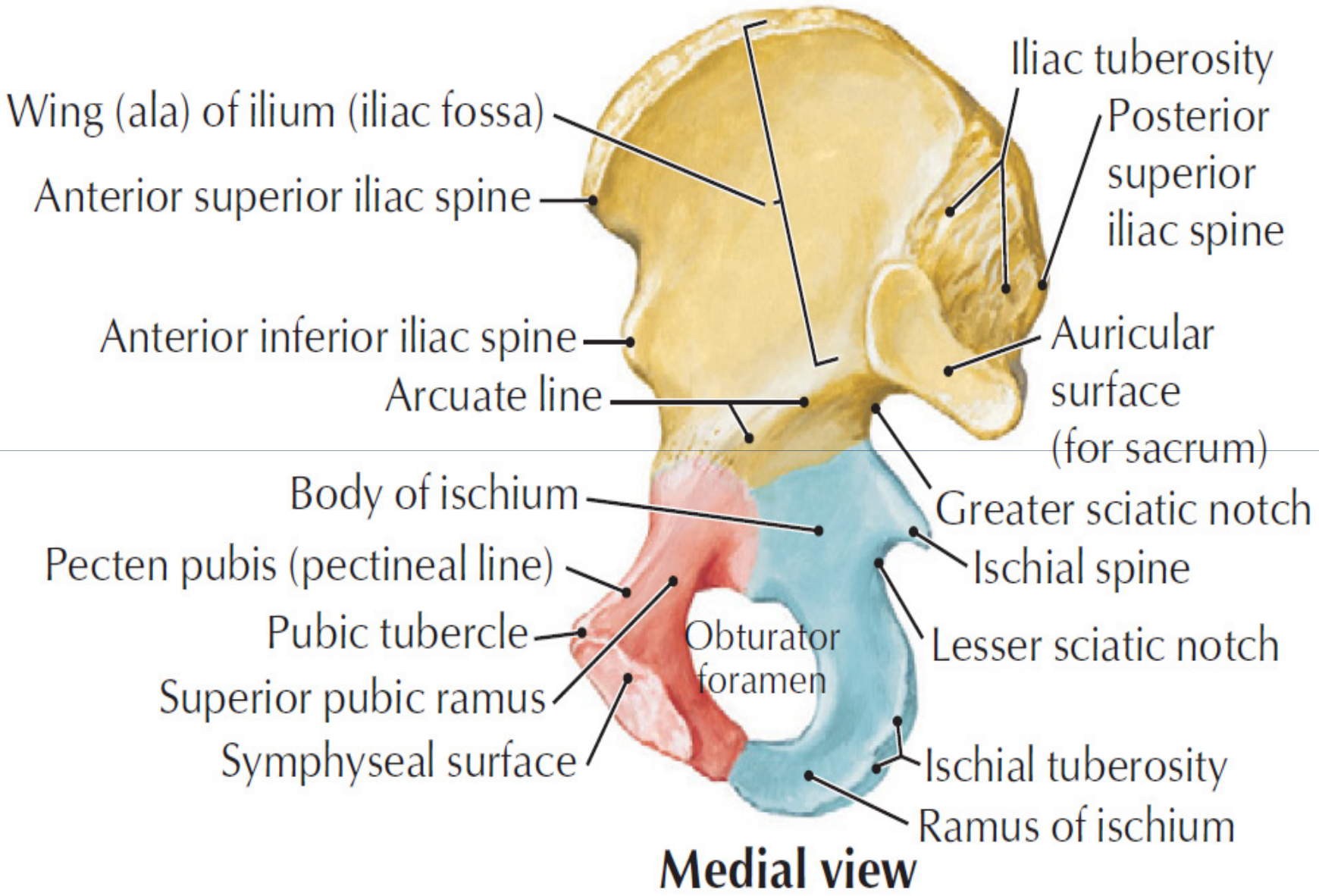
Bones of the Gluteal Region

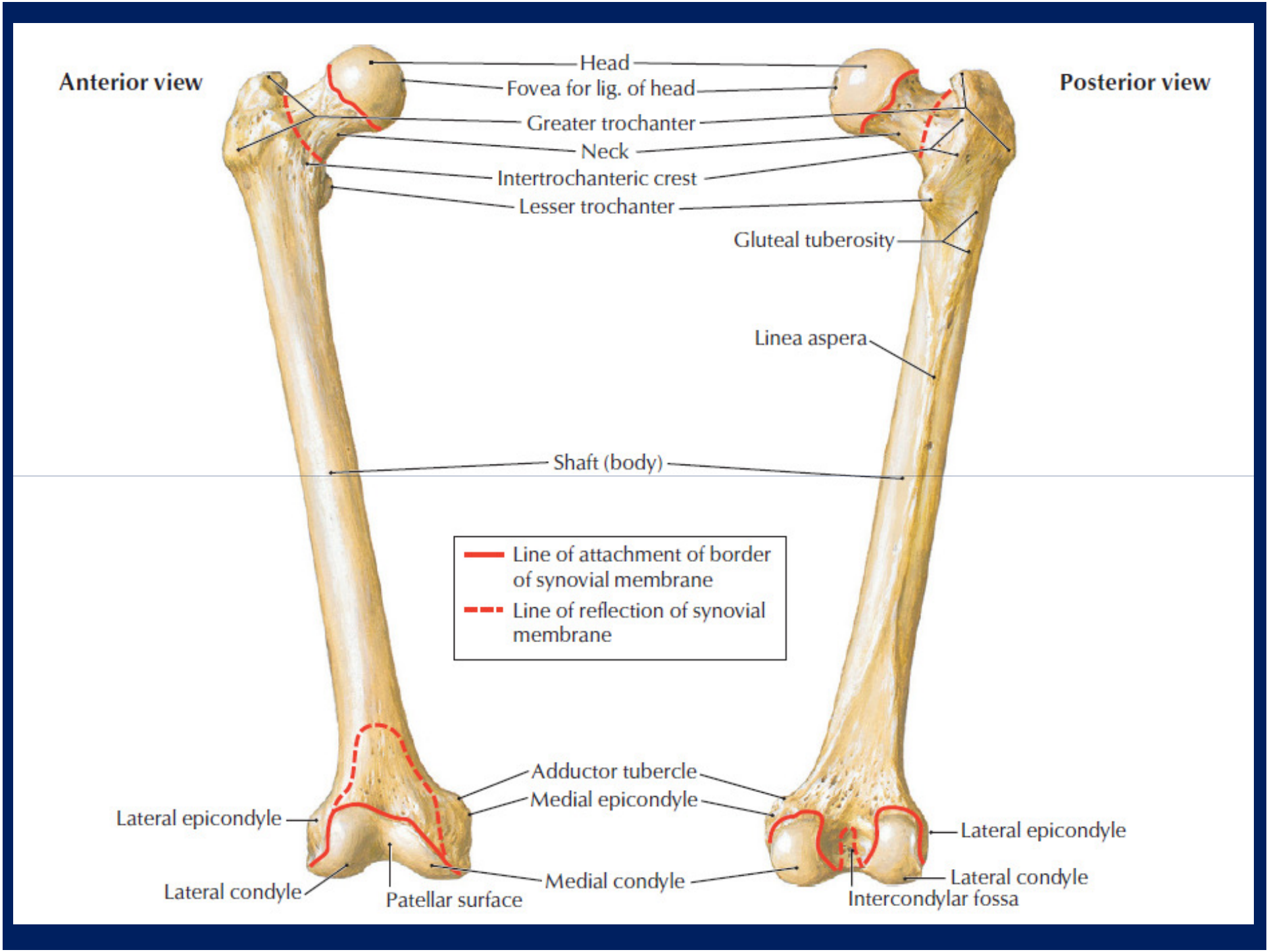
- Posterior aspect of:
  - Hip bone
  - Femur

    &
  - Hip joint



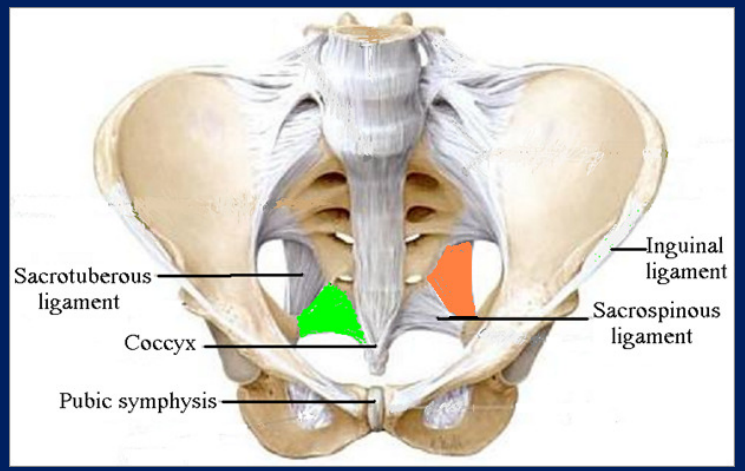

Lateral view
Greater sciatic notch
Wing (ala) of ilium
Posterior superior iliac spine
Anterior superior iliac spine
Anterior inferior iliac spine
Posterior inferior iliac spine
Acetabulum
Body of ilium
Acetabular notch
Ischial spine
Obturator crest
Body of ischium
Pubic tubercle
Ischial tuberosity
Inferior pubic ramus

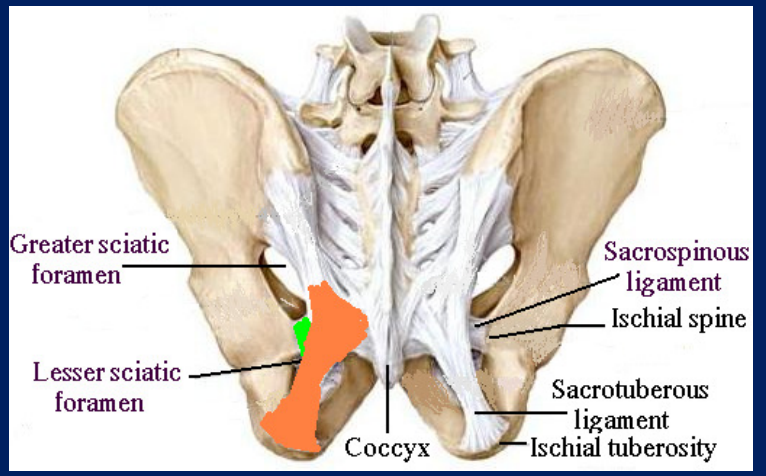

Wing (ala) of ilium (iliac fossa)
Anterior superior iliac spine
Anterior inferior iliac spine
Arcuate line
Body of ischium
Pecten pubis (pectineal line)
Pubic tubercle
Superior pubic ramus
Symphyseal surface
Iliac tuberosity
Posterior superior iliac spine
Auricular surface (for sacrum)
Greater sciatic notch
Ischial spine
Lesser sciatic notch
Obturator foramen
Ischial tuberosity
Ramus of ischium
Medial view


Anterior view
Posterior view
Head
Fovea for lig. of head
Greater trochanter
Neck
Intertrochanteric crest
Lesser trochanter
Gluteal tuberosity
Linea aspera
Shaft (body)
Line of attachment of border of synovial membrane
Line of reflection of synovial membrane
Adductor tubercle
Medial epicondyle
Lateral epicondyle
Lateral epicondyle
Lateral condyle
Patellar surface
Medial condyle
Lateral condyle
Intercondylar fossa

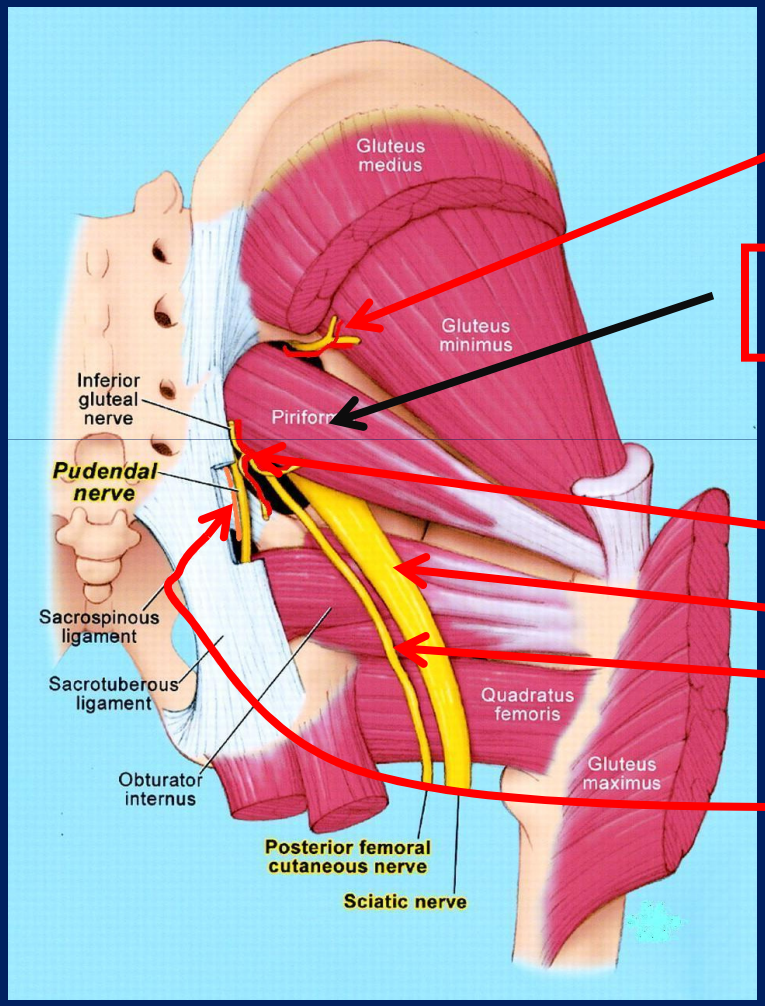
Ligaments of the Gluteal Region

- 2 ligaments:
  - Sacrospinous, connecting sacrum to ischial spine
  - Sacrotuberous, connecting sacrum to ischial tuberosity
- They convert the greater & lesser sciatic notches into greater & lesser sciatic foramina
- Their main function is to:
  - Stabilize the sacrum
  - Prevent its posterior rotation at the sacroiliac joint





Structures passing through the greater sciatic foramen



Above the piriformis:

Superior gluteal vessels & nerve

Piriformis: an important landmark

Below the piriformis:

Inferior gluteal vessels & nerve

Sciatic nerve

Posterior cutaneous nerve of thigh

Pudendalnerve & Internal pudendal vessels

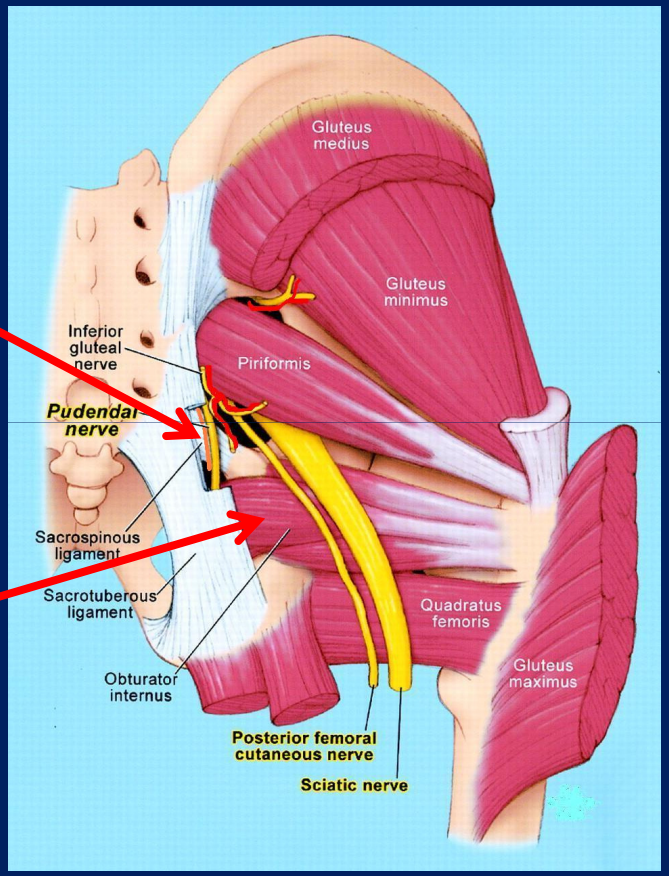
Nerve to obturator internus

Nerve to quadratus femoris

Structures passing through the lesser sciatic foramen

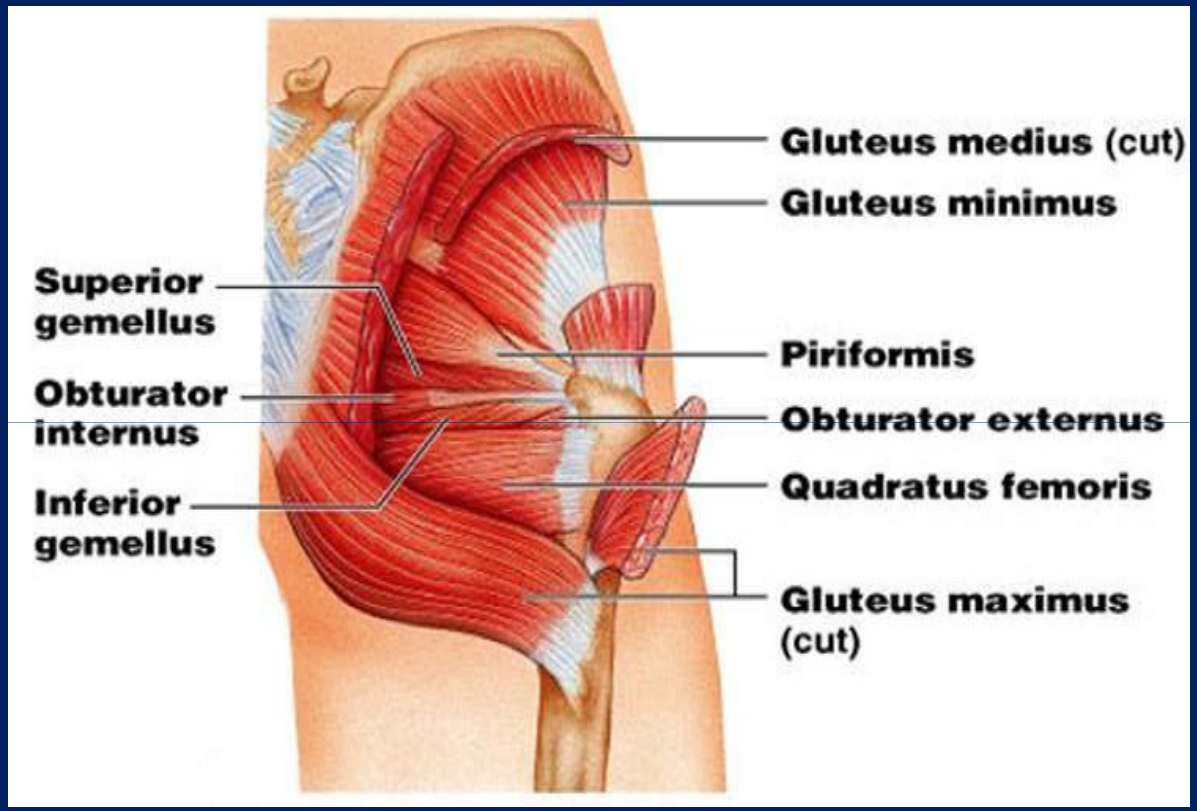
Entering:
Pudendal nerve &
Internal pudendal vessels

Exiting:
Tendon of obturator internus
Nerve to obturator internus



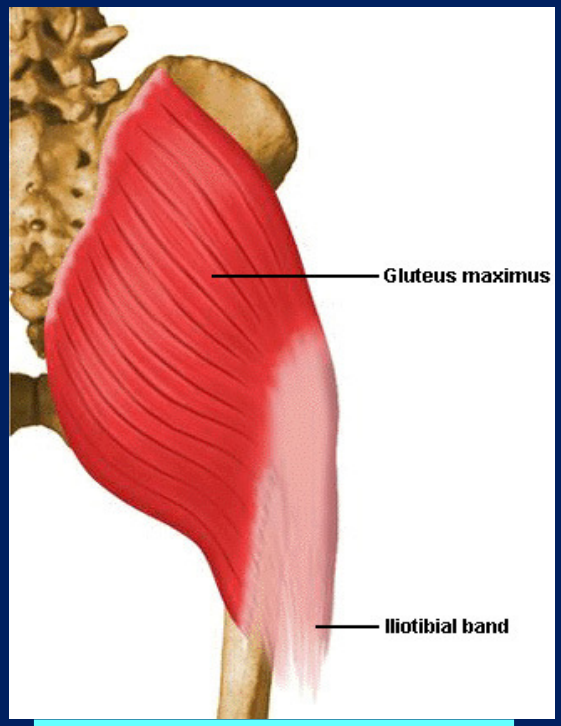
Muscles of the Gluteal Region

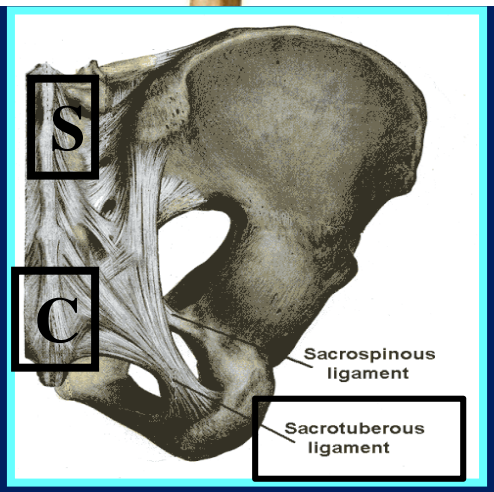
- Gluteus maximus
- Gluteus medius
- Gluteus minimus
- Tensor fascia lata
- Piriformis
- Superior Gemellus
- Inferior Gemellus
- Obturator internus
- Quadratus femoris



Gluteus Maximus

- Largest muscle in the body
- Forms the prominence of buttock
- Origin:
  - Outer surface of ilium behind the posterior gluteal line
  - Lumbar fascia
  - Posterior surface of sacrum & coccyx
  - Sacrotuberous ligament





- Insertion:
  - Most of the muscle (3/4th) inserted into the iliotibial tract
  - Deeper fibers inserted to the gluteal tuberosity
- Nerve supply:
  - Inferior gluteal nerve (L5, S1, 2)

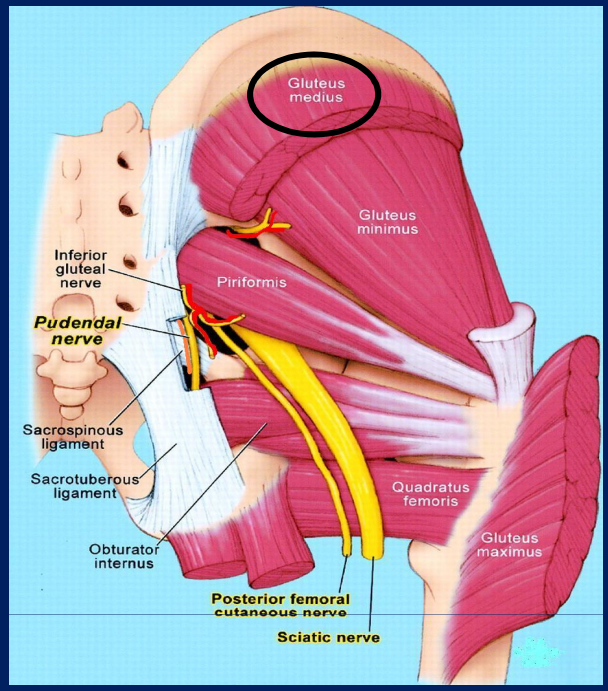
Actions:

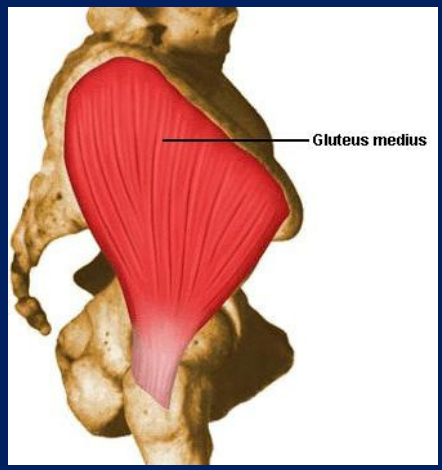
- Extends & laterally rotates the hip joint
- Extends the knee joint (through iliotibial tract)
- Gives simultaneous stability to the hip and knee joints through the iliotibial tract

Gluteus maximus is the chief antigravity muscle of the hip. It is used in standing up from a sitting position, running & climbing up stairs. In each case extension of the hip moves the trunk upwards. The muscle must be extremely powerful to raise the weight of the body against gravity. This is called "forced extension".

Gluteus Medius

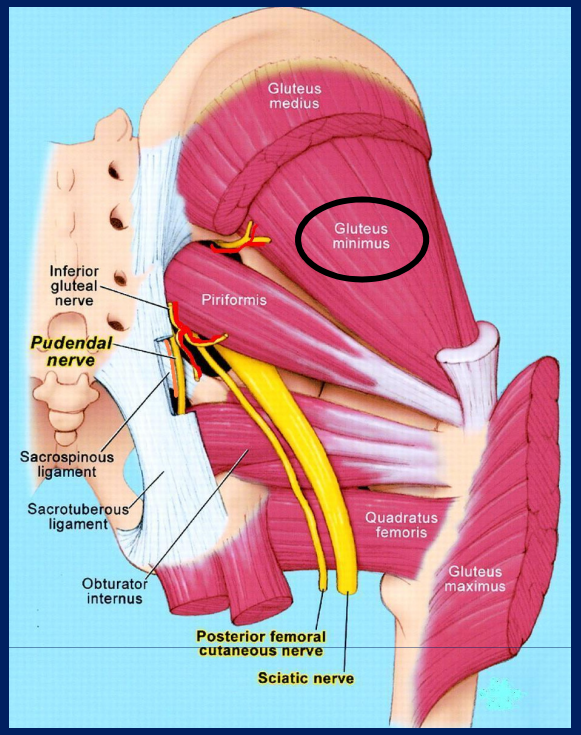
- Origin: outer surface of ilium between the middle and posterior gluteal lines
- Insertion: Lateral surface of greater trochanter
- Nerve supply: Superior gluteal nerve (L4,5, S1)
- Action:
  - Abducts & medially rotates the thigh
  - Steady pelvis in walking

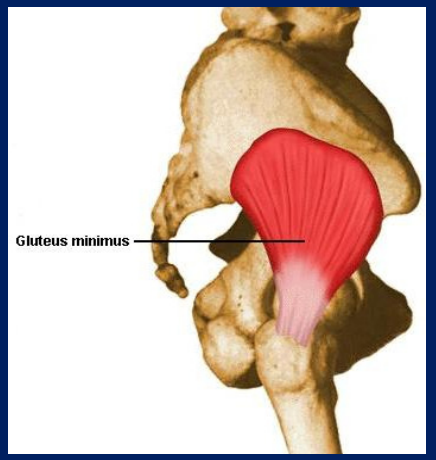




Gluteus Minimus

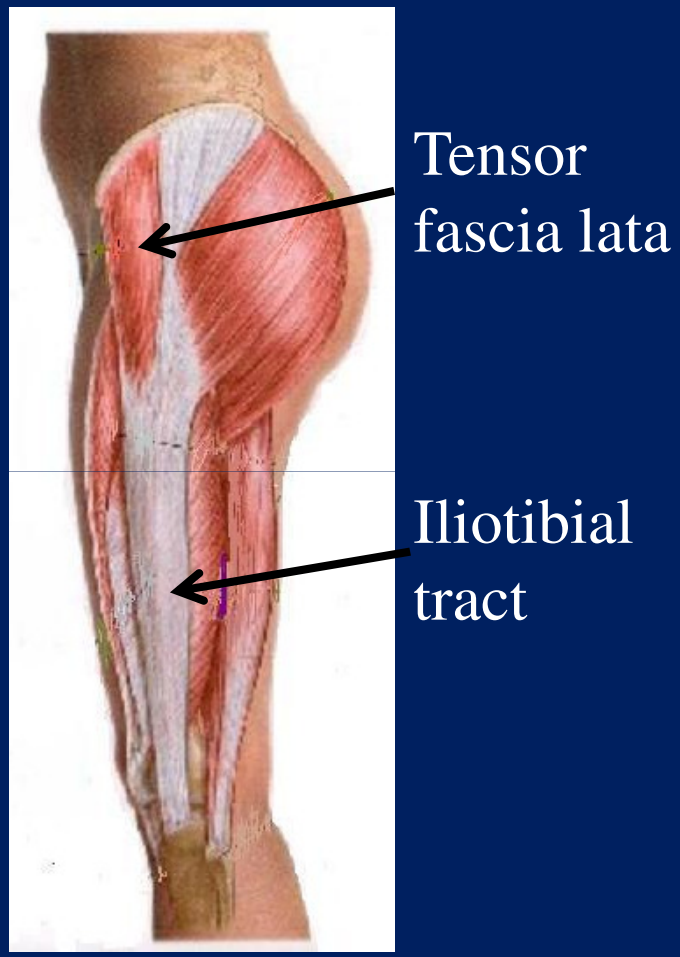
- Origin: outer surface of ilium
- Insertion: Anterior surface of greater trochanter
- Nerve supply: Superior gluteal nerve (L4,5, S1)
- Action: Abducts & medially rotates the thigh





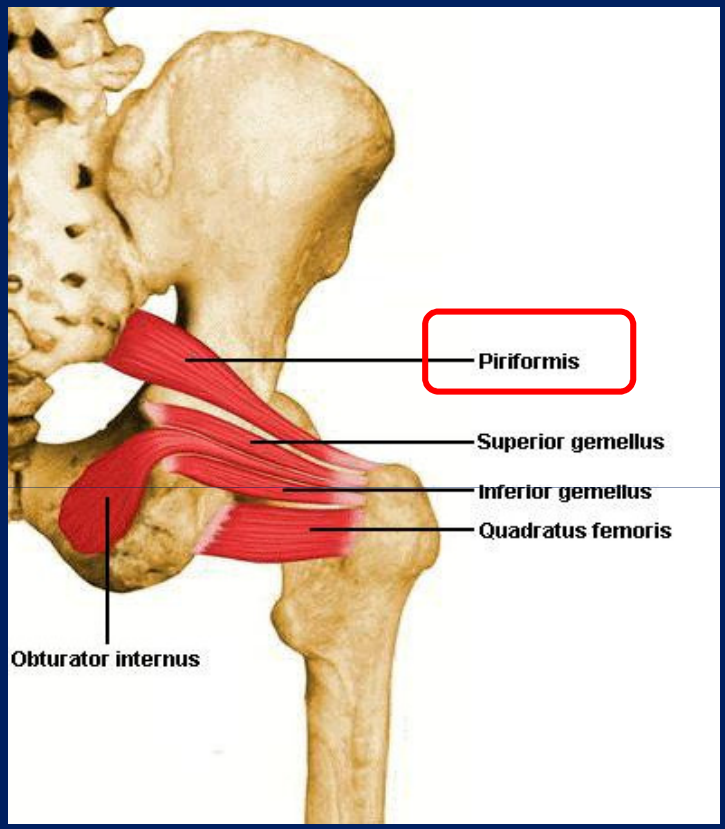
Tensor Fascia Lata

- Origin: Outer edge of iliac crest between anterior superior iliac spine & iliac tubercle
- Insertion: Into the iliotibial tract
- Nerve supply: Superior gluteal nerve (L4,5, S1,2)
- Action: Maintains the knee in extended position



Piriformis

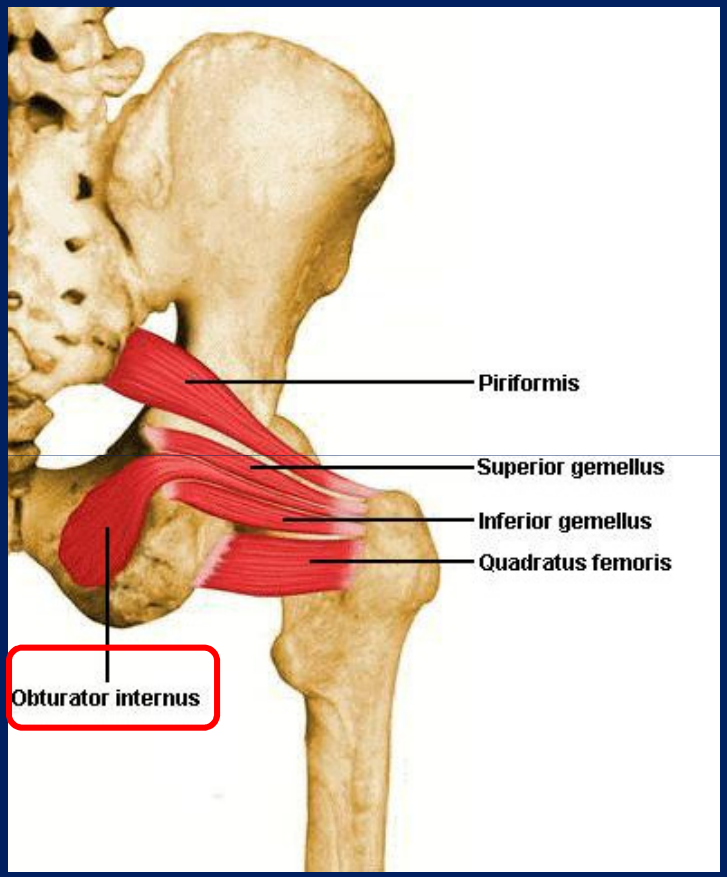
- Origin: Anterior surface of S2,3,4 vertebrae
- Insertion: Upper border of greater trochanter
- Nerve supply: Anterior rami of L5,S1,2
- Action:
  - Lateral rotator of thigh
  - Assists in stabilizing hip joint especially in abduction



Piriformis forms an important landmark in the region

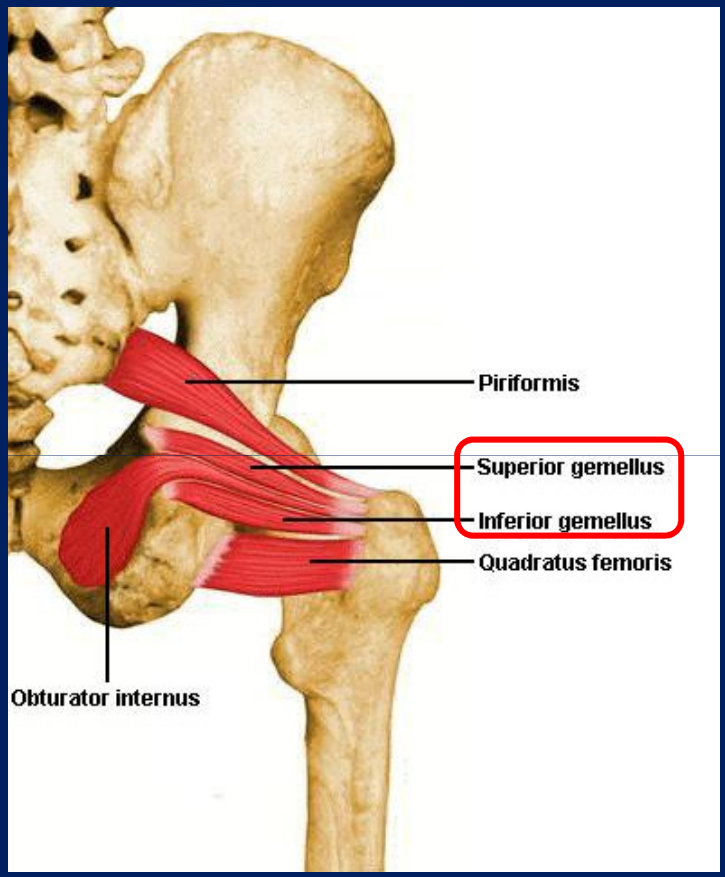
Obturator Internus

- Origin: Inner surface of obturator membrane and adjacent bone
- Insertion: Upper border of greater trochanter along with gemelli
- Nerve supply: nerve to obturator internus (L4,5,S1)
- Action: Lateral rotator of thigh



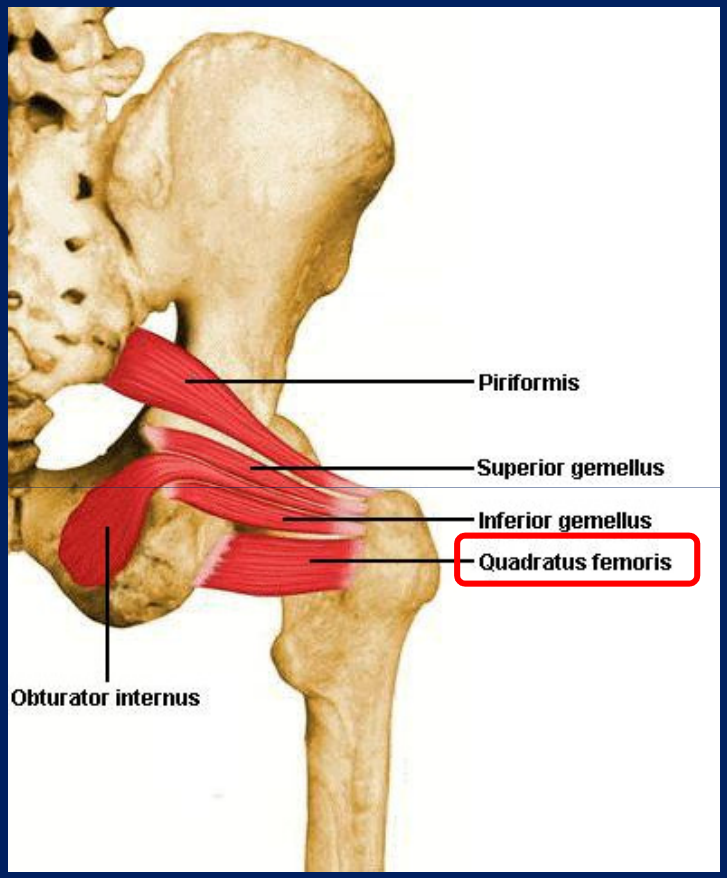
Superior & Inferior Gemelli

- Origin:
  - Superior from ischial spine
  - Inferior from ischial tuberosity
- Insertion: Upper border of greater trochanter
- Nerve supply:
  - Superior from nerve to obturator internus (L4,5, S1)
  - Inferior from nerve to quadratus femoris (L4,5, S1)
- Action: Lateral rotators of thigh



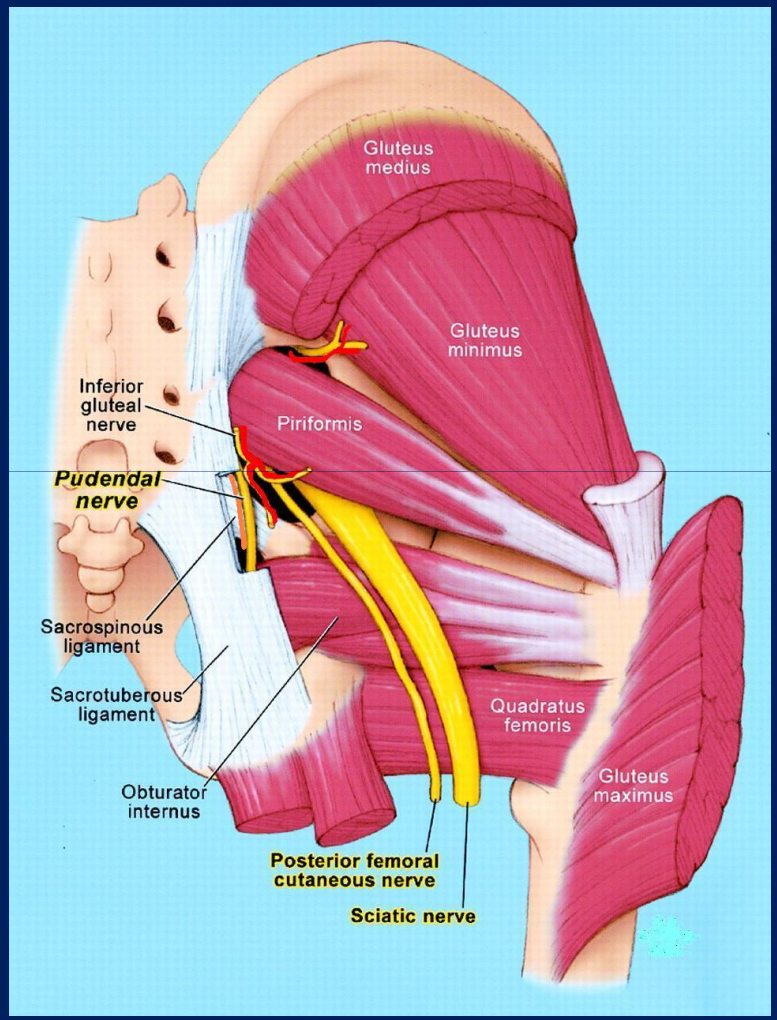
Quadratus Femoris

- Origin: Lateral border of ischial tuberosity
- Insertion: Quadrate tubercle of femur
- Nerve supply: nerve to quadratus femoris (L4,5,S1)
- Action: Lateral rotator of thigh



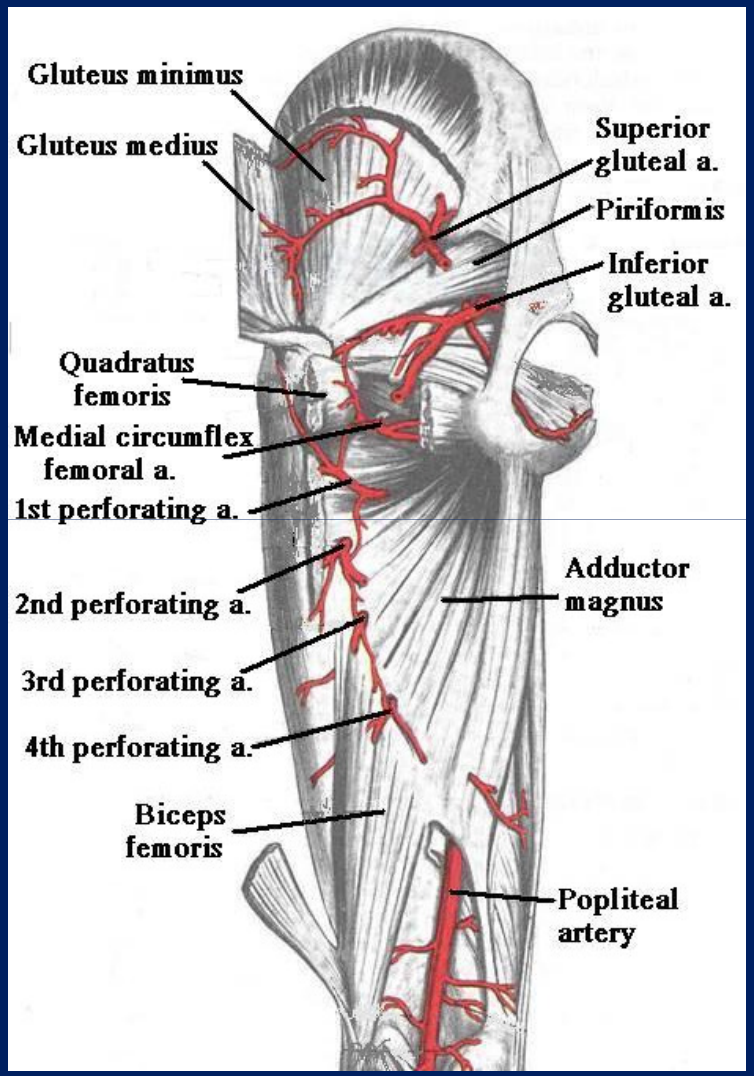
Nerves of the Gluteal Region

- Sciatic
- Posterior cutaneous nerve of the thigh
- Superior gluteal
- Inferior gluteal
- Nerve to quadratus femoris
- Pudendal nerve
- Nerve to obturator internus



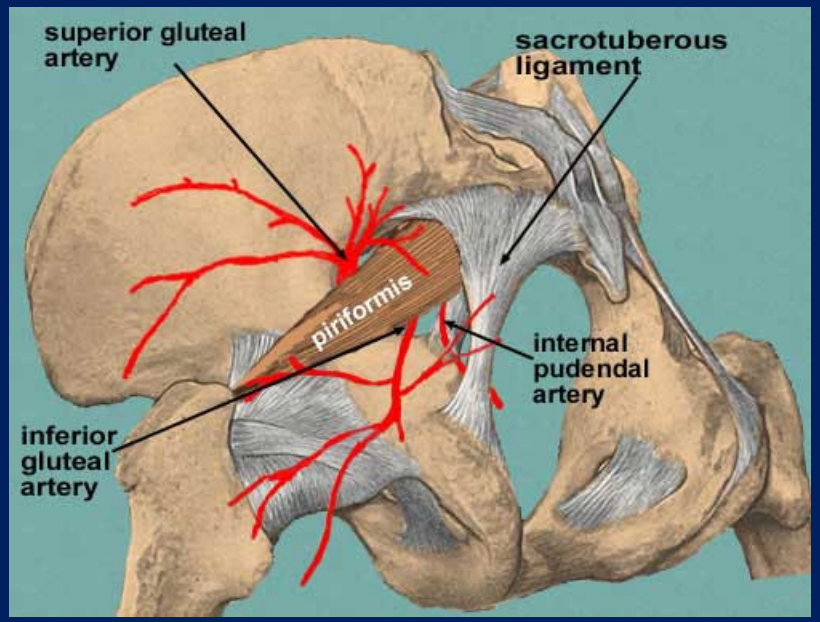
Arteries of the Gluteal Region

- Branches of internal iliac artery:
  - Superior gluteal
  - Inferior gluteal
- Branches of femoral artery:
  - Lateral circumflex
  - Medial circumflex
- Branche of profunda femoris artery:
  - First perforating branch



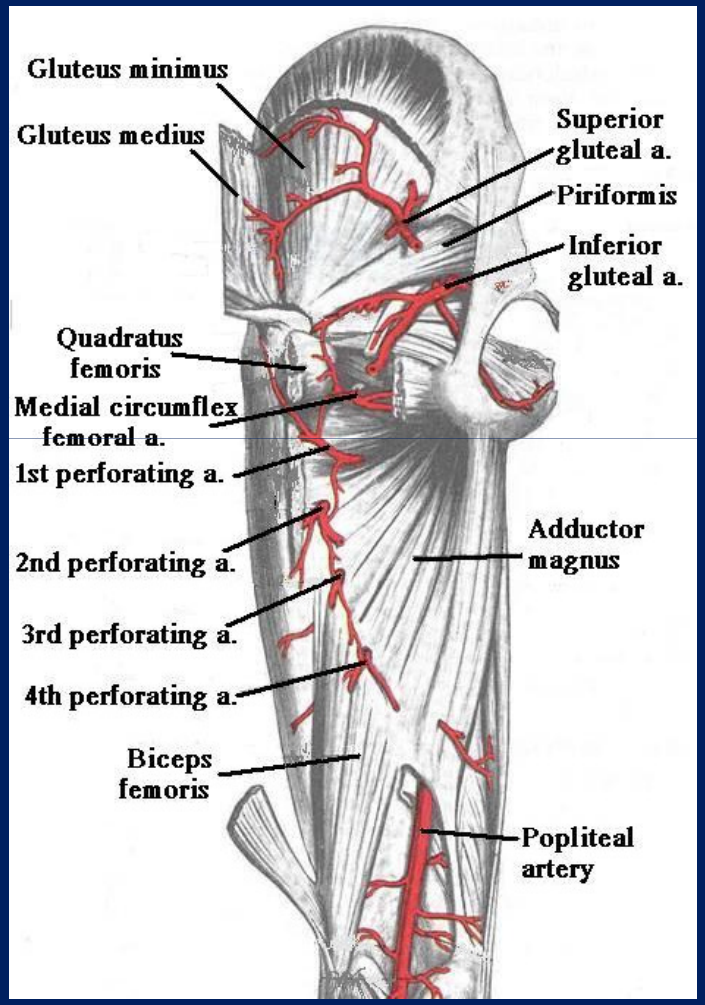
Superior & Inferior Gluteal Arteries

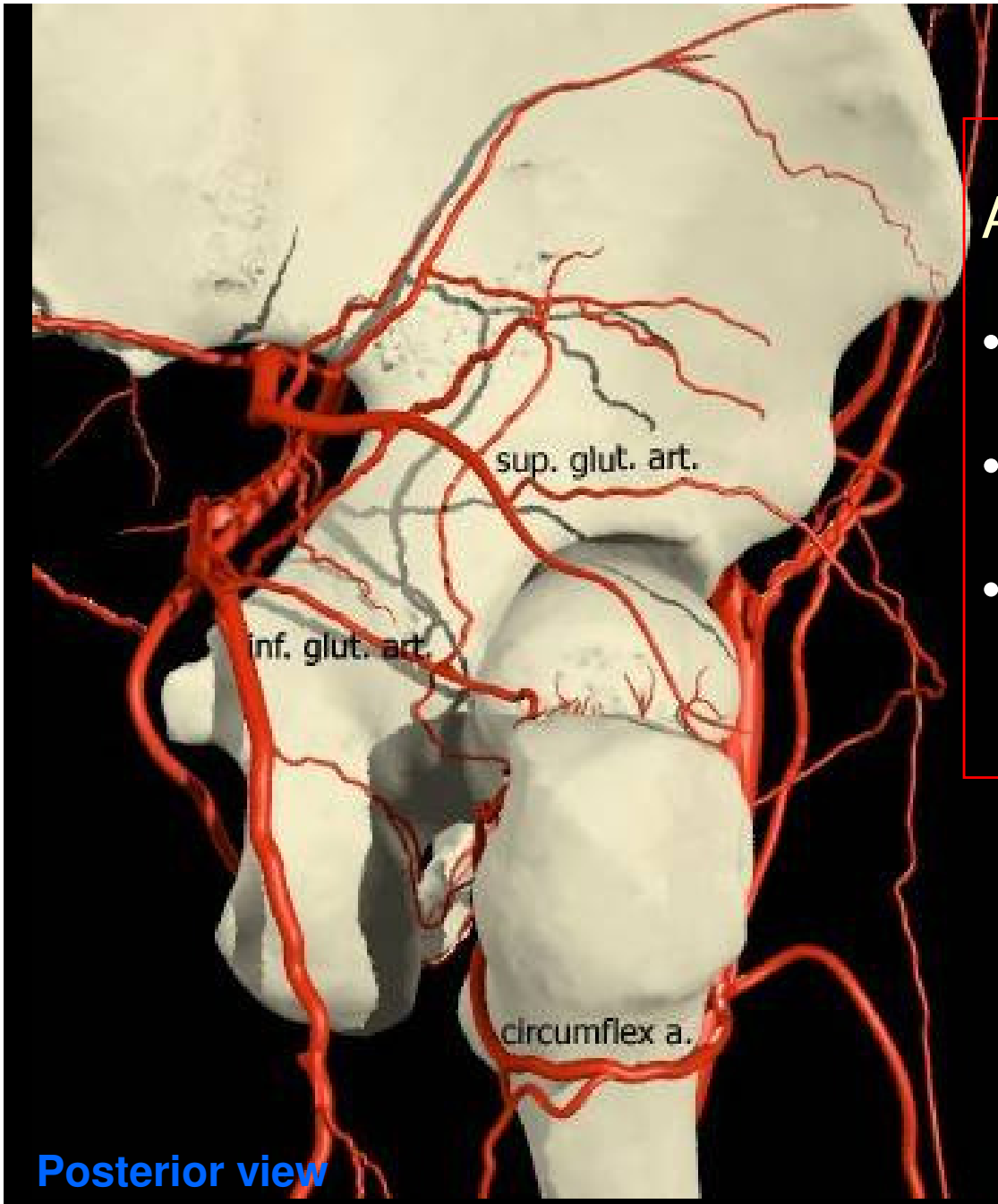
- Are branches of the internal iliac artery
- Enter the gluteal region through the greater sciatic foramen (superior gluteal artery above the piriformis, inferior gluteal artery below the piriformis)
- Supply the gluteal region and contribute to the anastomosis around the hip joint



Trochanteric Anastomosis

- Is the main supply to the head & neck of femur
- Provides a connection between internal iliac and femoral arteries
- Lies near the trochanteric fossa, branches run along the femoral neck beneath the reticular fibers of the capsule
- Formed by:
  - Descending branches of superior and inferior gluteal arteries &
  - Ascending branches of lateral and medial circumflex arteries





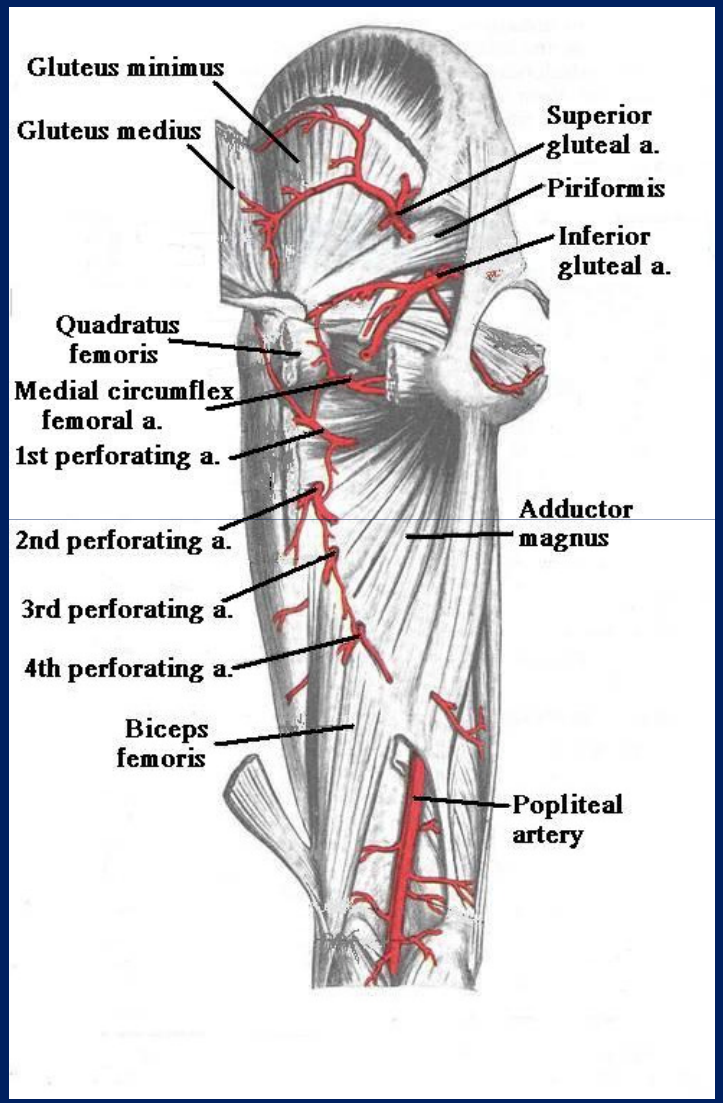
Arterial supply to Femoral head

- Medial & lateral femoral circumflex arteries
- Superior and inferior gluteal arteries
- Post. obdurator artery via artery of femoral ligament

TROCHANTERIC ANASTOMOSIS

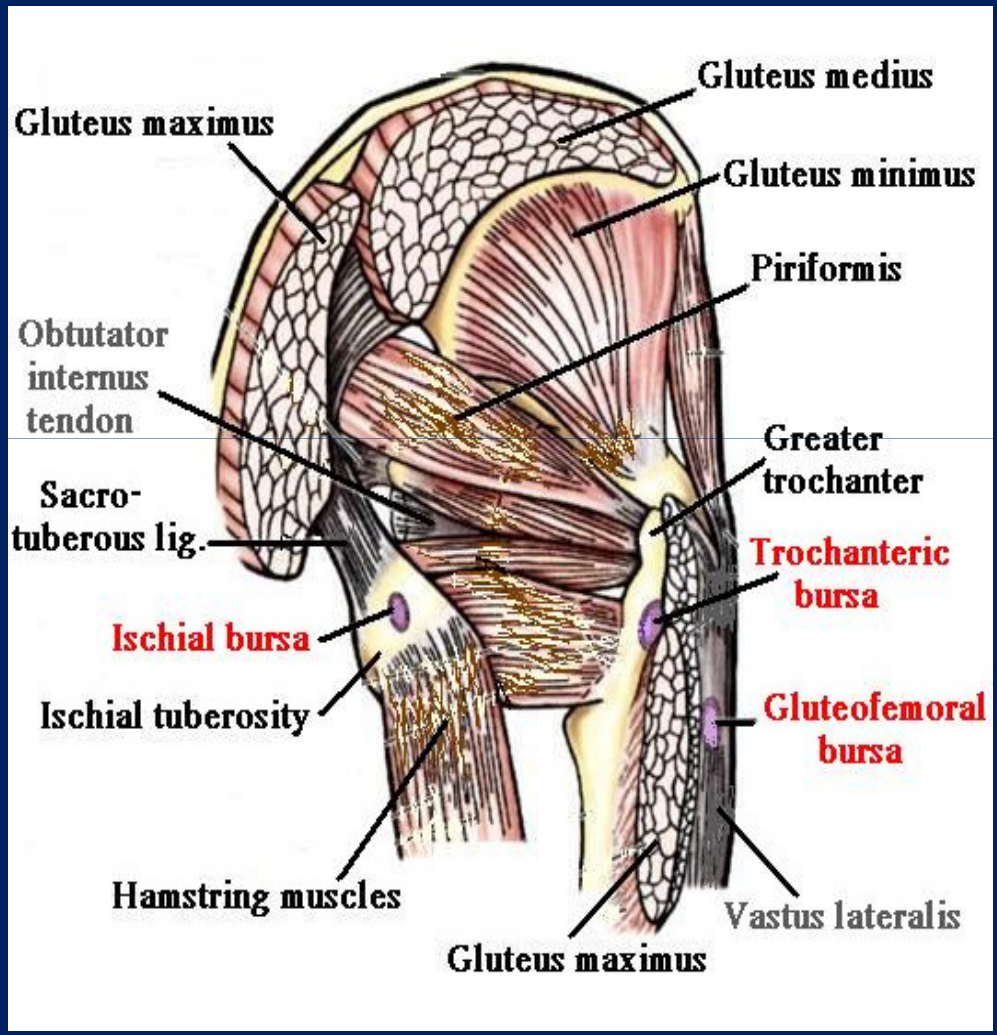
Cruciate Anastomosis

- Lies at the level of lesser trochanter
- Provides a connection between internal iliac and femoral arteries
- Formed by:
  - Descending branch of inferior gluteal artery
  - Transverse branches of medial and lateral circumflex arteries &
  - Ascending branch of first perforating artery



Bursae Related to Gluteus Maximus

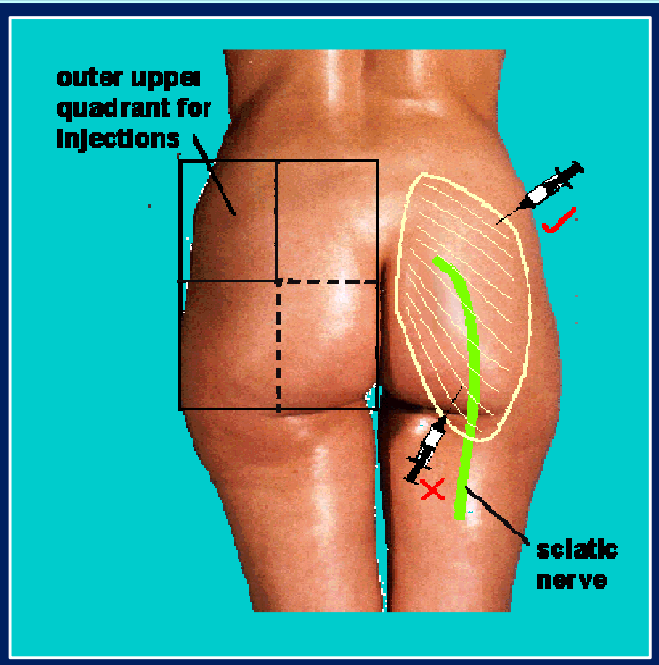
- Gluteofemoral Bursa: lies between gluteus maximus tendon and vastus lateralis
- Trochanteric Bursa: lies between gluteus maximus tendon and greater trochanter
- Ischial Bursa: lies between gluteus maximus & ischial tuberosity



Safe Area for Intramuscular Injection

- Intramuscular injection enables a large amount of a drug to be introduced at once but absorbed gradually.
- The injection site must be carefully selected to avoid injury to the underlying large vessels and nerves.

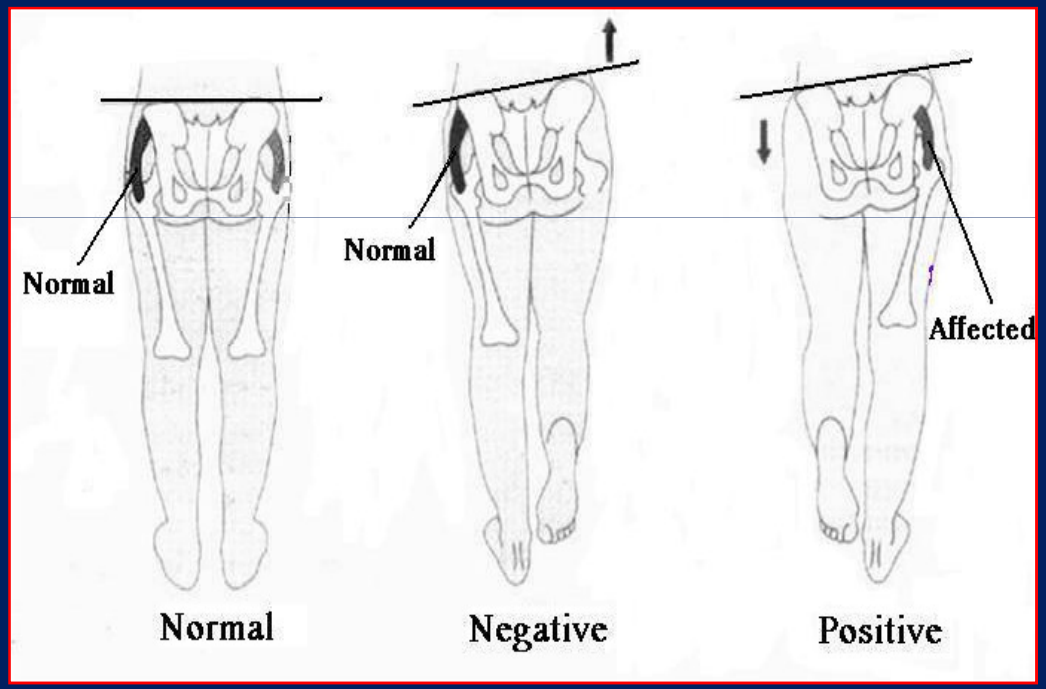
Outer upper quadrant of the buttock is the safe area for intramuscular injection to avoid injury to the underlying sciatic nerve



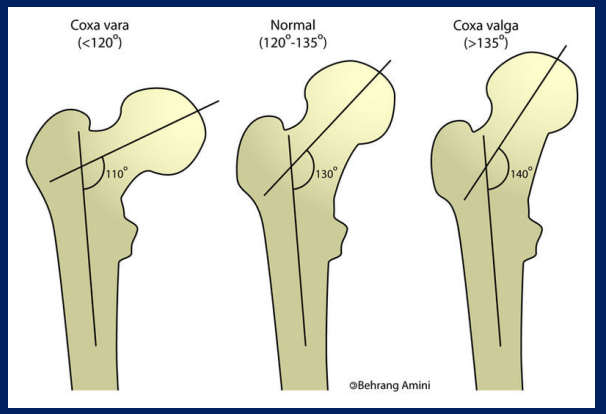
Trendelenburg Test

- To assesses whether the hip abductors (particularly gluteus medius) are functioning normally

- Observe patient from behind, ask him/her to stand on one foot and then the other
  - Negative test: Pelvis 'tilts up' on contralateral side
  - Positive test: Pelvis 'sags' on contralateral side



- Problems that could lead to a positive Trendelenburg test:
  - Fracture neck of femur
  - Dislocation of hip joint
  - Coxa Vara
  - Nonfunctioning gluteus medius and minimus due to:
    - Neurological damage (L4 – 5 disc herniation)
    - Any disease affecting muscles (myopathy)



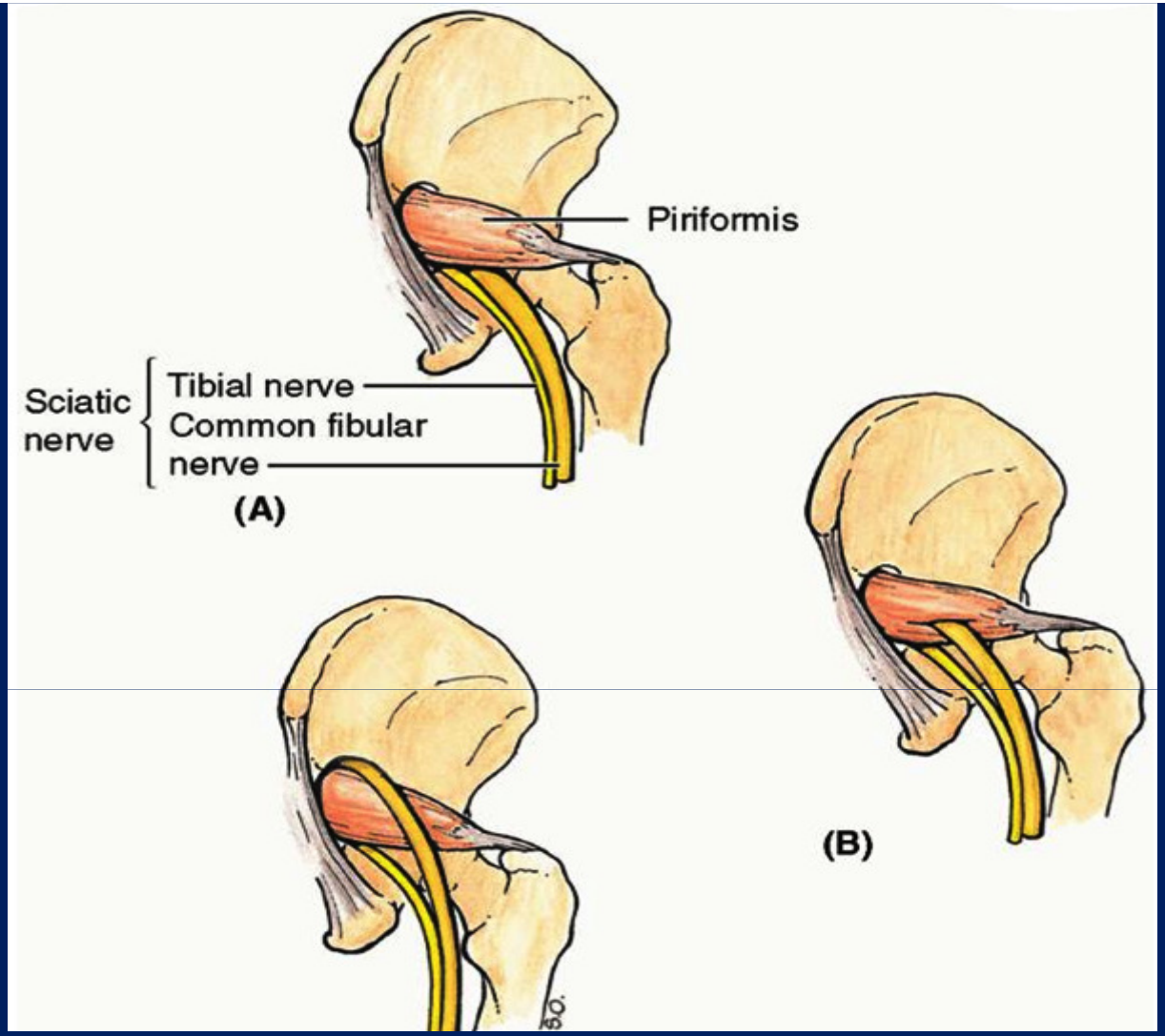


FIGURE 5.43. Relationship of sciatic nerve to piriformis. A. The sciatic nerve usually emerges from the greater sciatic foramen inferior to the piriformis. B. In 12.2% of 640 limbs studied by Dr. J. C. B. Grant, the sciatic nerve divided before exiting the greater sciatic foramen; the common fibular division (yellow) passed through the piriformis. C. In 0.5% of cases, the common fibular division passed superior to the muscle, where it is especially vulnerable to injury during intragluteal injections.

Thank You & Good Luck