

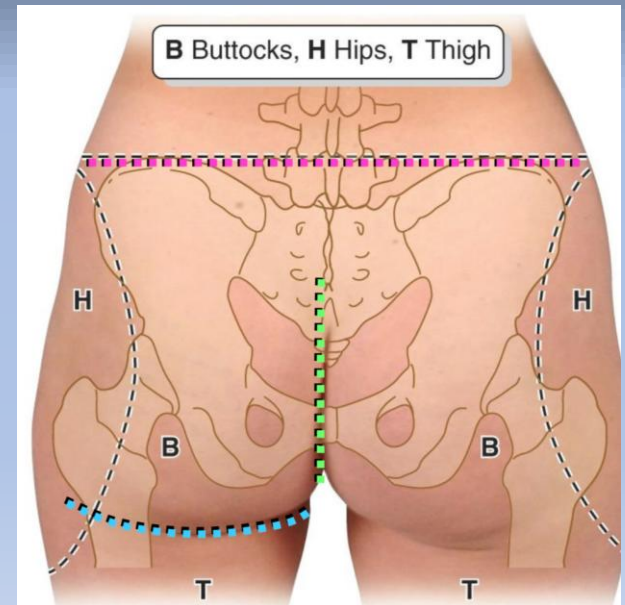
د. ميثم الاعرجي



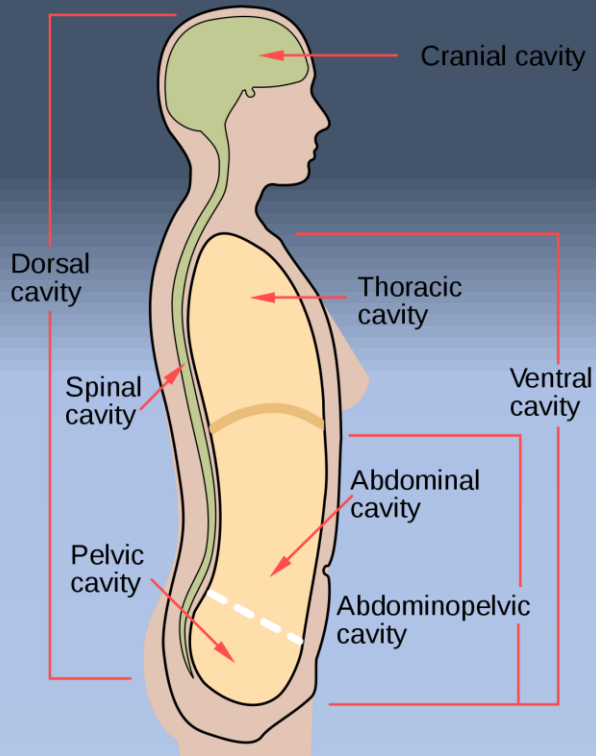
Introduction to Gluteal Region

Landmarks

- **Gluteal region** - prominent area posterior to pelvis, inferior to the level of iliac crests
- Also known as the 'buttocks'
- Landmarks of gluteal region:
 - Superior boundary: level of **iliac crests** (L4-L5 vertebrae)
 - Inferior boundary: **gluteal folds**



Note:



Don't get confused by the differences between these terms

Pelvis

Pelvic cavity

Pelvic girdle/ bony pelvis

Pelvic wall

Perineum

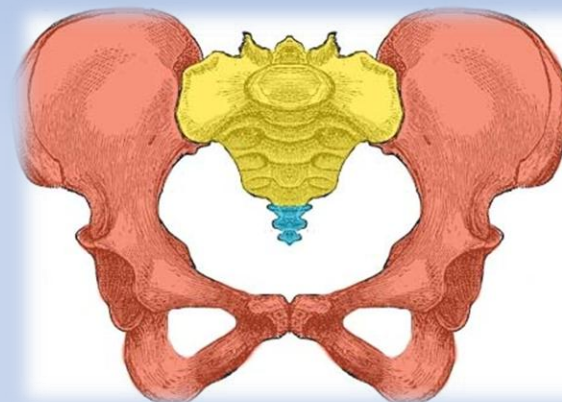
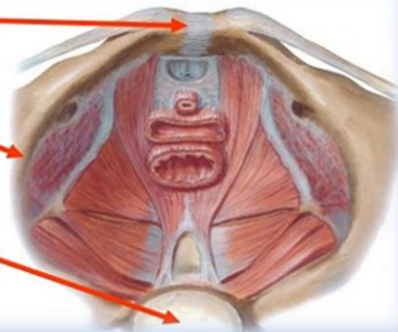
LOOK INTO & UNDERSTAND these terms

1) Anterior pelvic wall

2) Lateral pelvic wall

3) Posterior wall

4) Pelvic floor



■ Hip bones

■ Sacrum

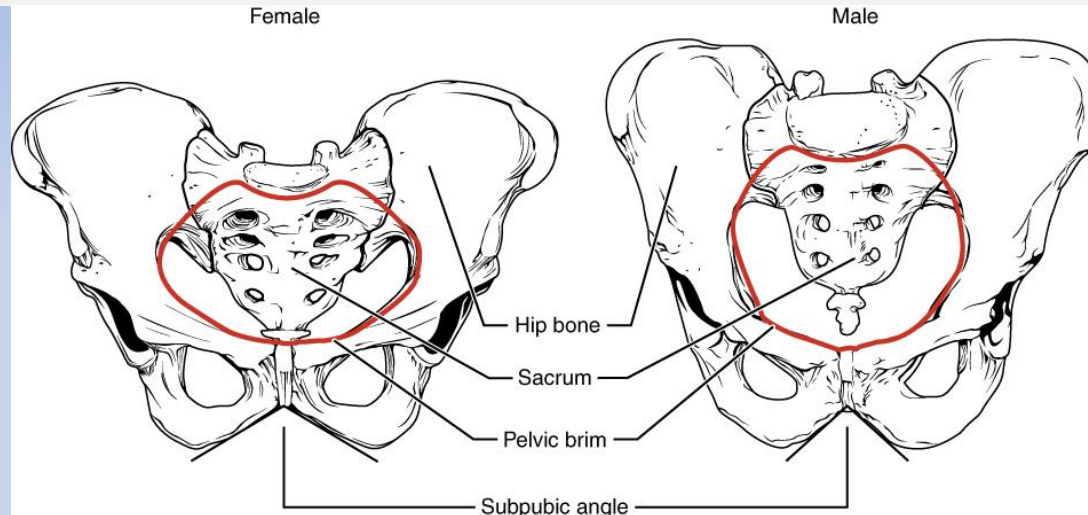
■ Coccyx



Osteology of Gluteal Region/ Pelvis

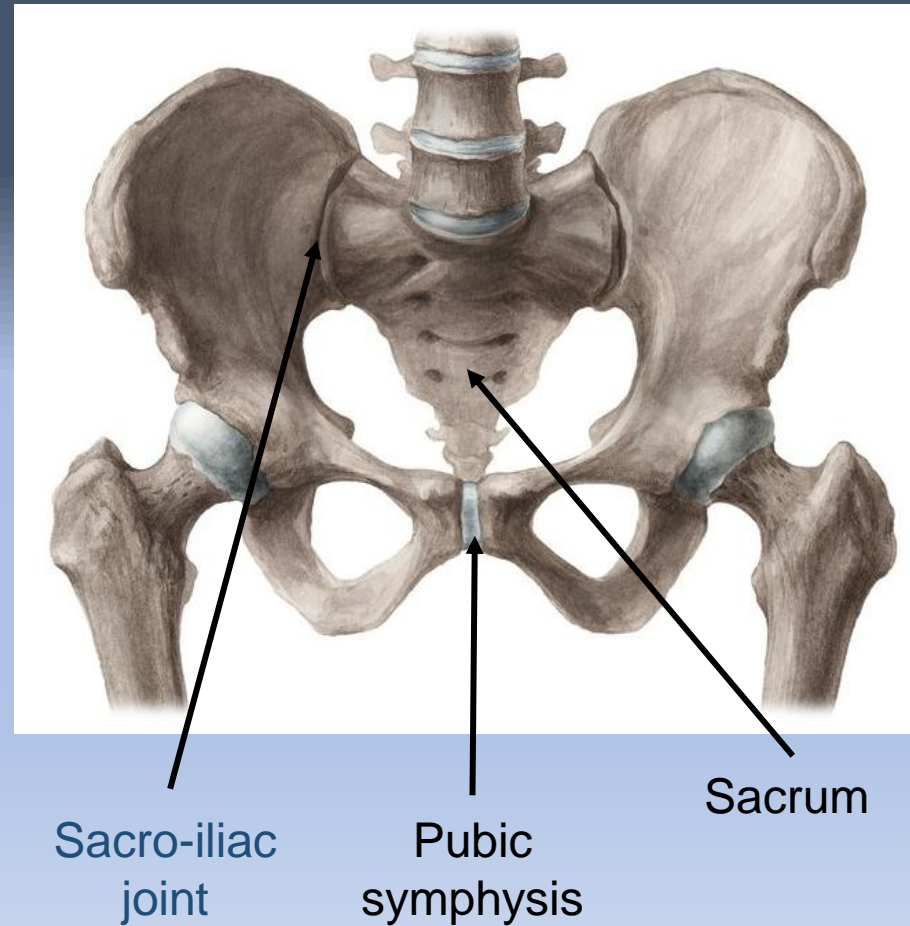
Pelvic Girdle

- Also known as **bony pelvis**
- **Basin-shaped** ring of bones (pelvic brim) connecting vertebral column to the femurs
- Functions:
 - **Bear weight** of upper body (standing & sitting)
 - **Support** and **protect** visceral structures in the pelvic area (GIT, GUT, reproductive organs)
 - Provide **attachment sites** for muscles, ligaments and membranes (GIT, erectile bodies of genitalia, pelvic floor, lower limbs)



Bones of pelvic girdle

- Formed by:
 - **Hip bones**: right & left
 - **Sacrum** (sacro-coccyx)
- They joints anteriorly by **pubic symphysis**
- Joints posteriorly with sacrum at **sacro-iliac joints**



Bony pelvis: the hip bone

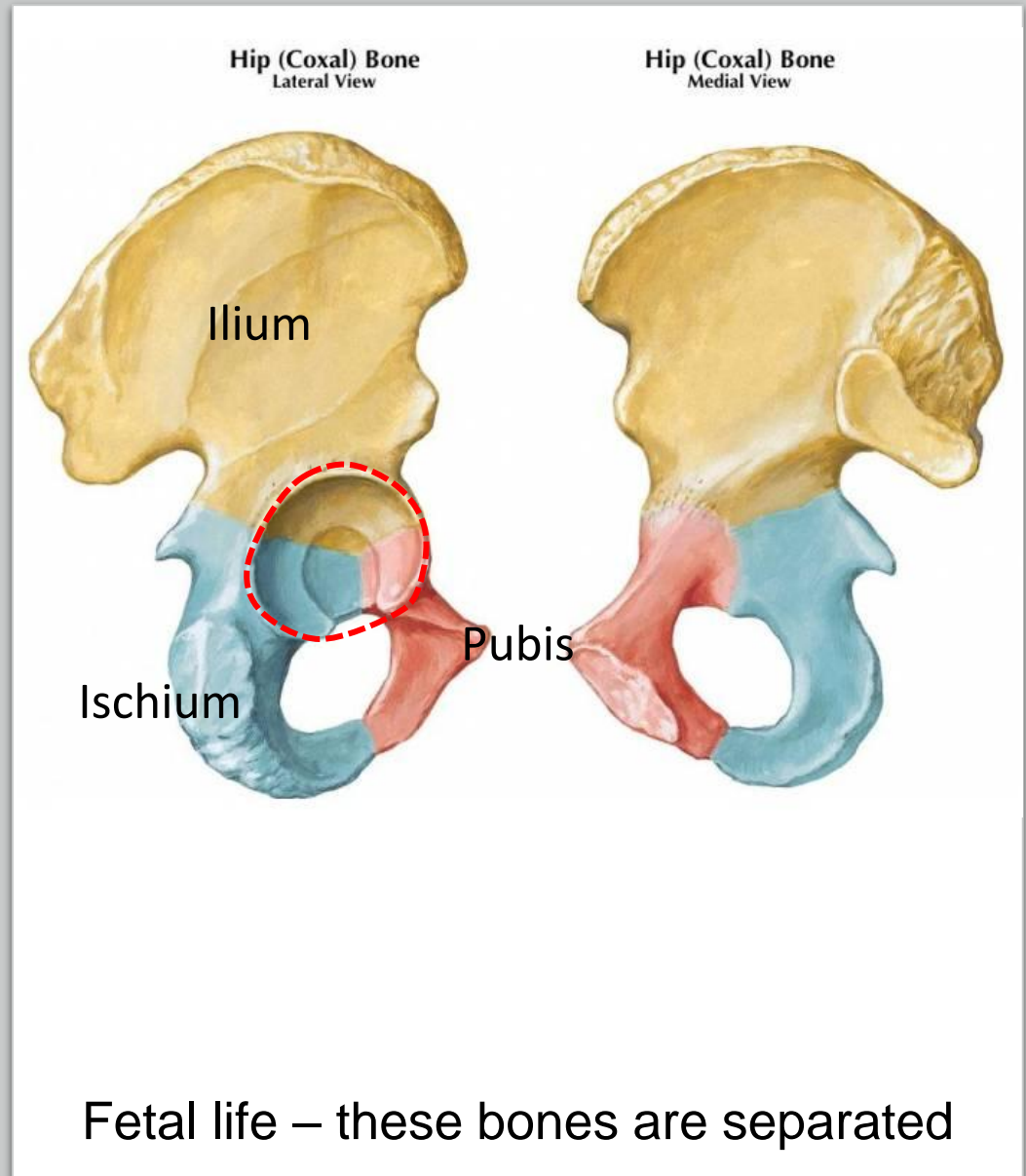
Formed by the **fusion** of
3 primary bones:

Ilium

Ischium

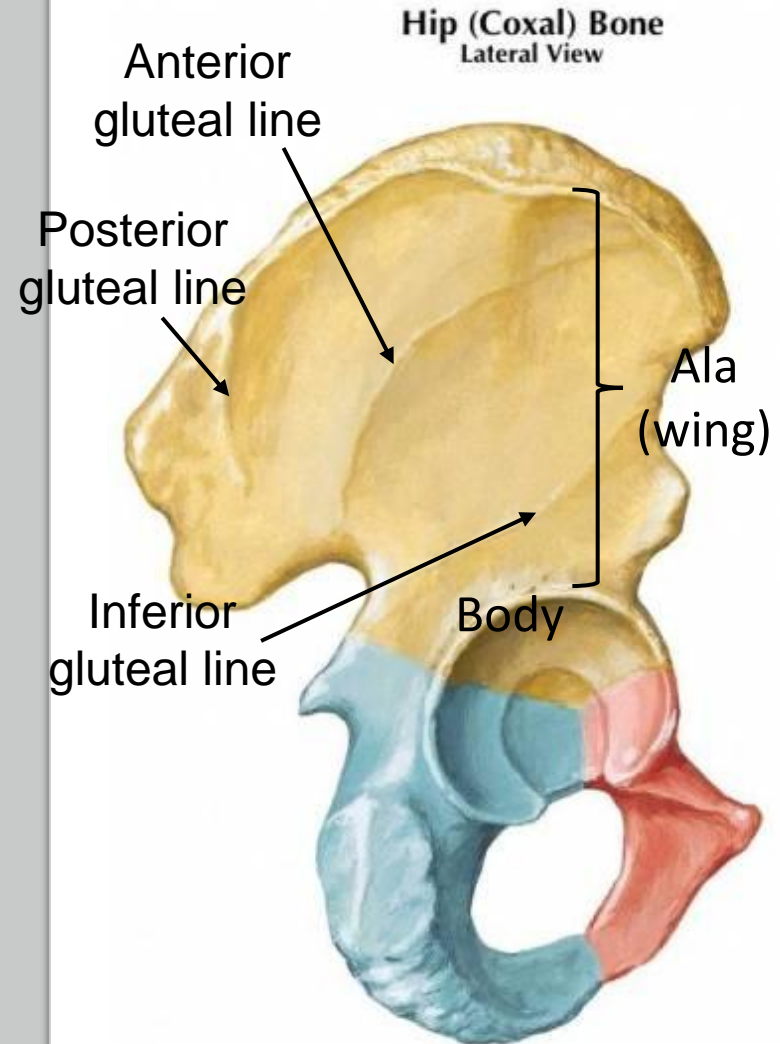
Pubis

- They meet at the **acetabulum**: a cup-like cavity (socket) on lateral aspect of the hip bone
- Serves as site of articulation for head of femurs



Ilium

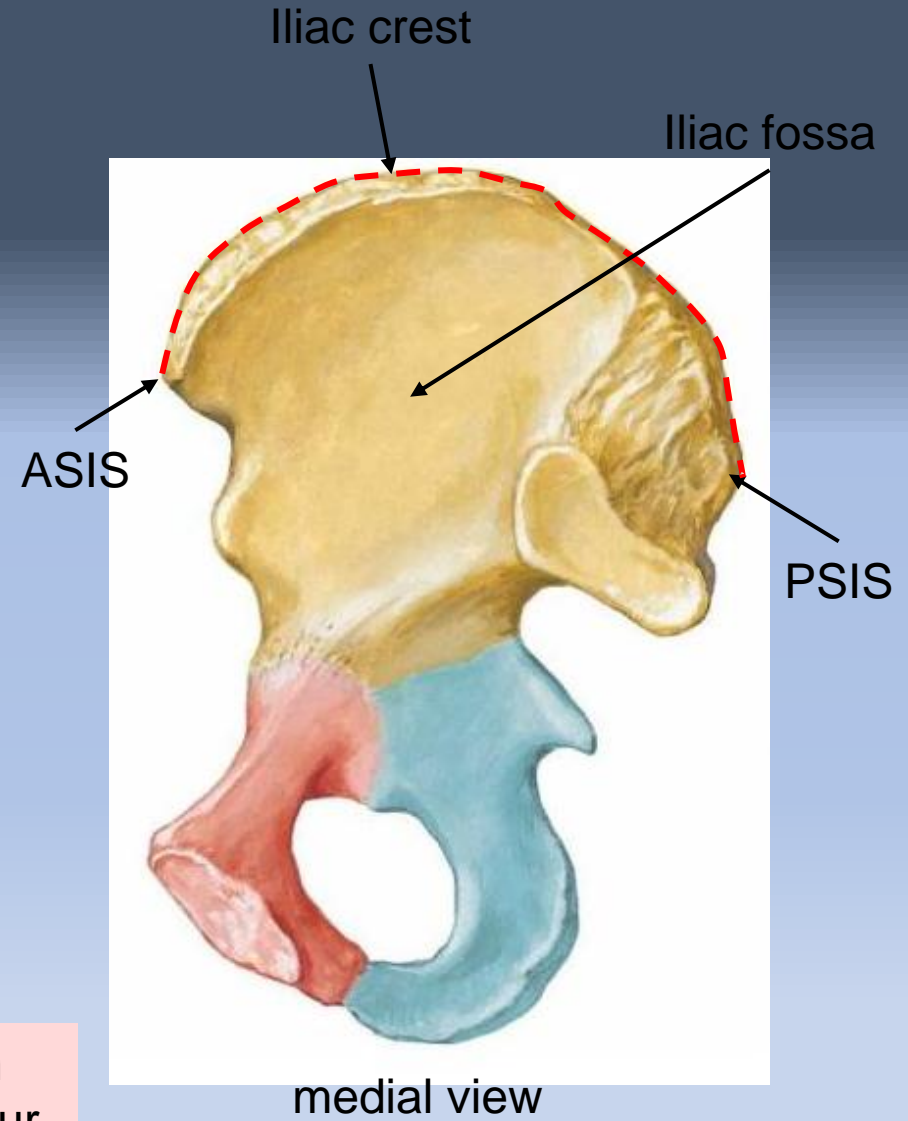
- Superior & largest part of hip bone
- It is flattened & fan-shaped
- The **ala** (*wing*) of ilium represents spread of a fan
- **Body** of ilium represents handle of a fan which:
 - Forms the superior part of acetabulum
 - Joins with pubis and ischium



Iliac crest is the rim of ilium

- It has a **curve** which follows the **contour of ala** between anterior (ASIS) and posterior superior iliac spines (PSIS)

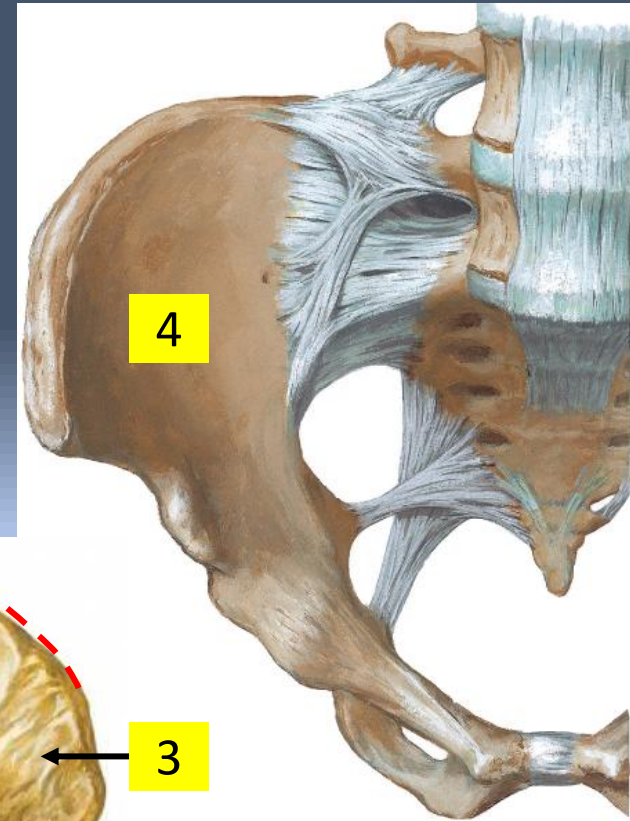
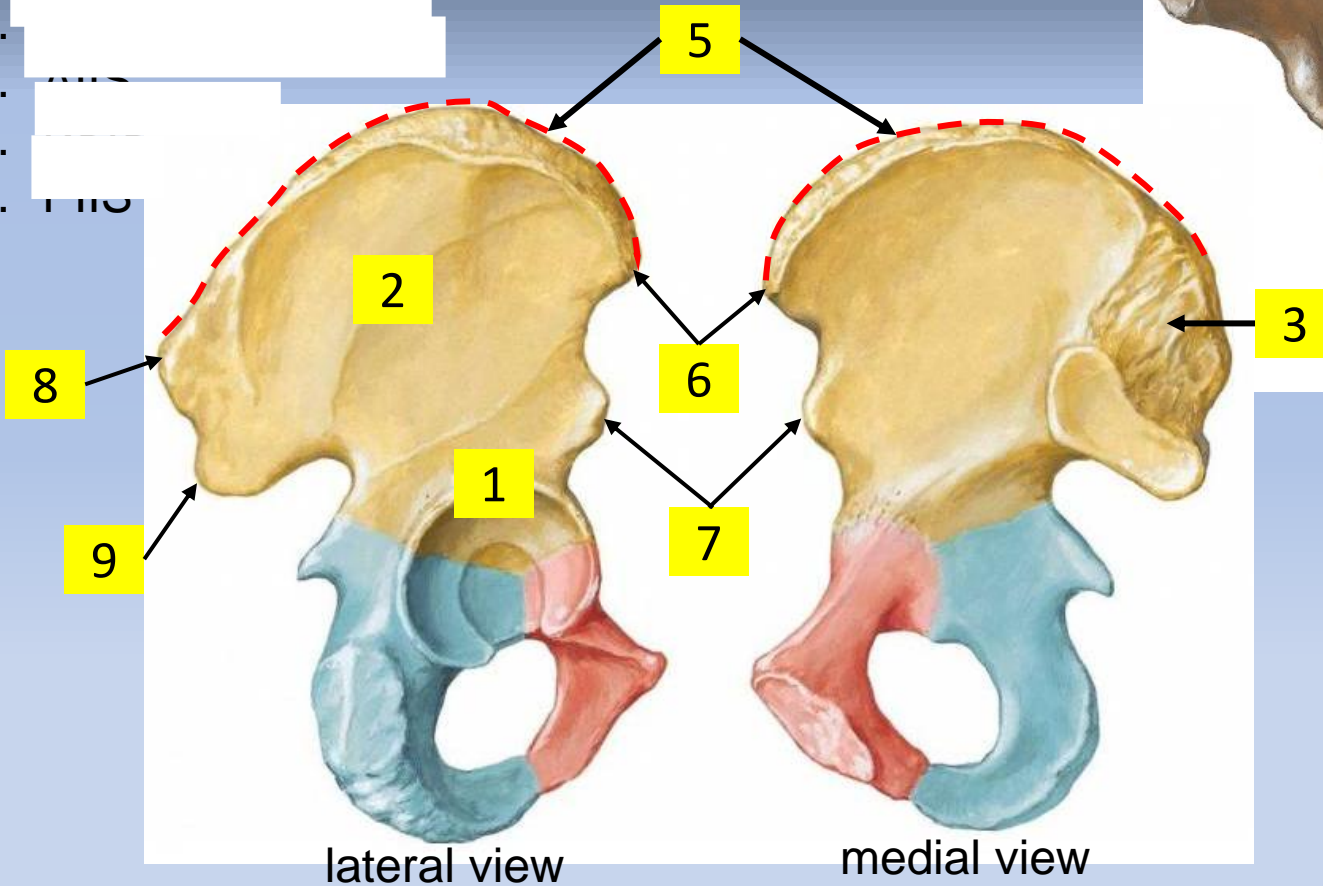
Iliac fossa is the anterior concave part of the ala



“When your hands are on your hips, they rest on your **iliac crests...**”

Important parts of ilium

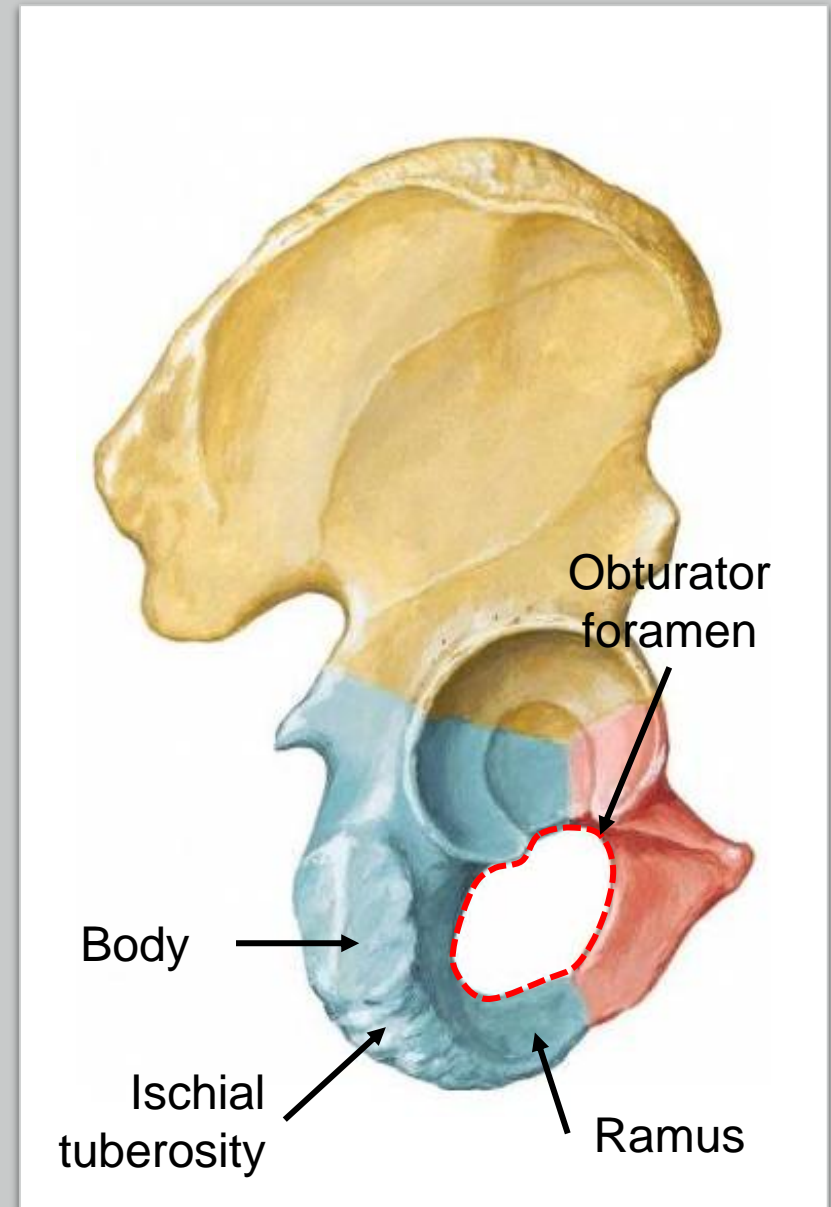
- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.



anterior view

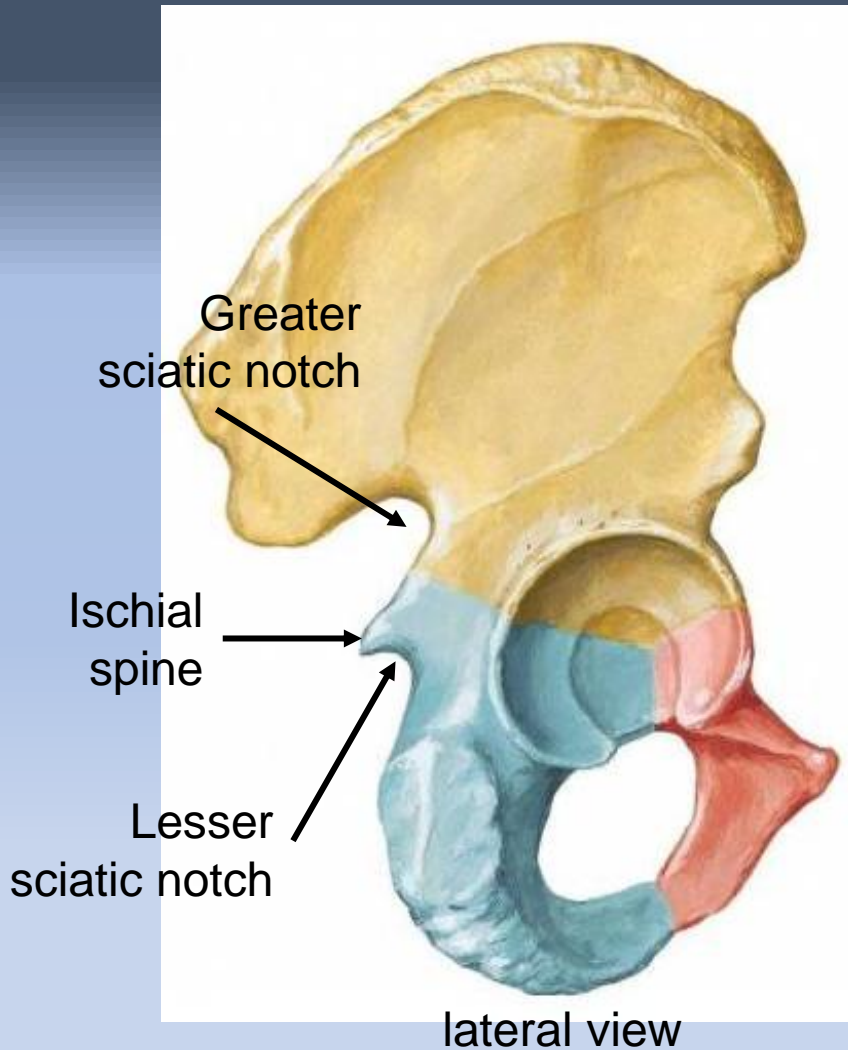
Ischium

- It has a **body** & a **ramus**
- The **body** of ischium forms the posterior part of the acetabulum
- The **ramus** forms part of inferior boundary of **obturator foramen**
- **Ischial tuberosity**: large postero-inferior protuberance of ischium



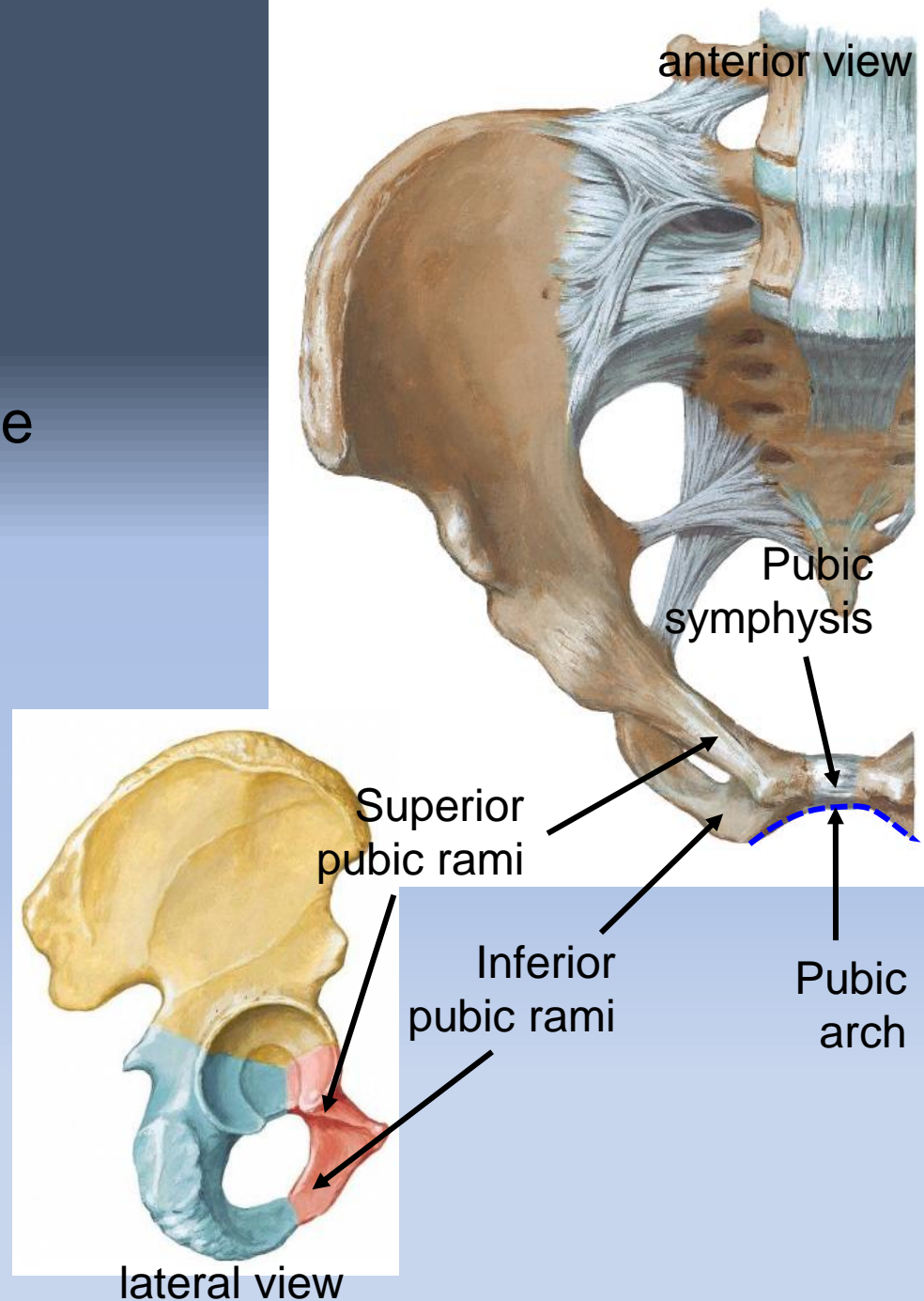
- There are **deep indentations** at posterior border called **greater** and **lesser sciatic notch**

- Small pointed posterior **projection** near the junction of the ramus and body is the **ischial spine**

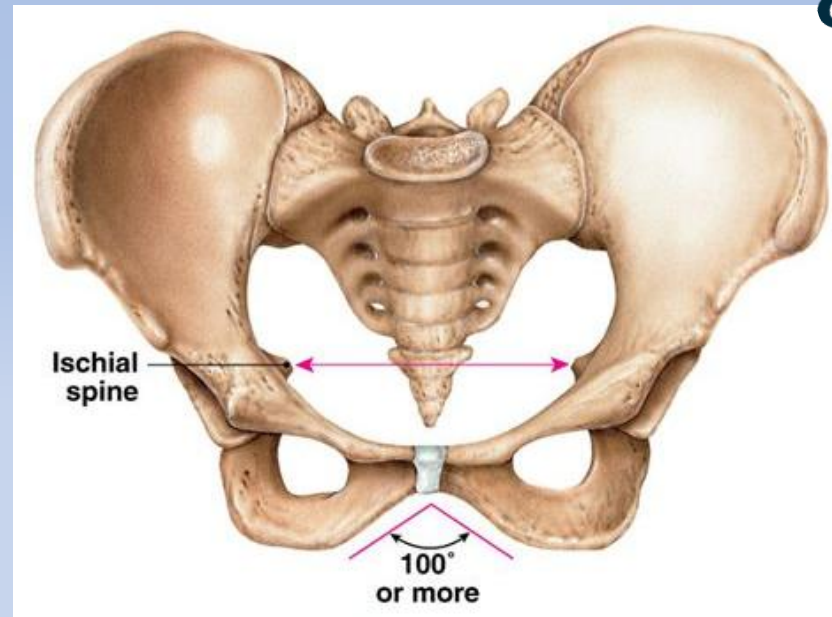
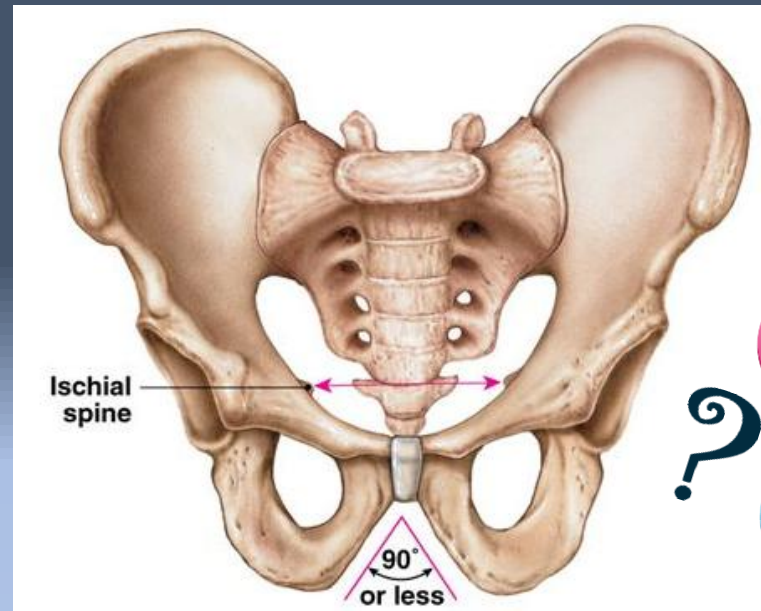


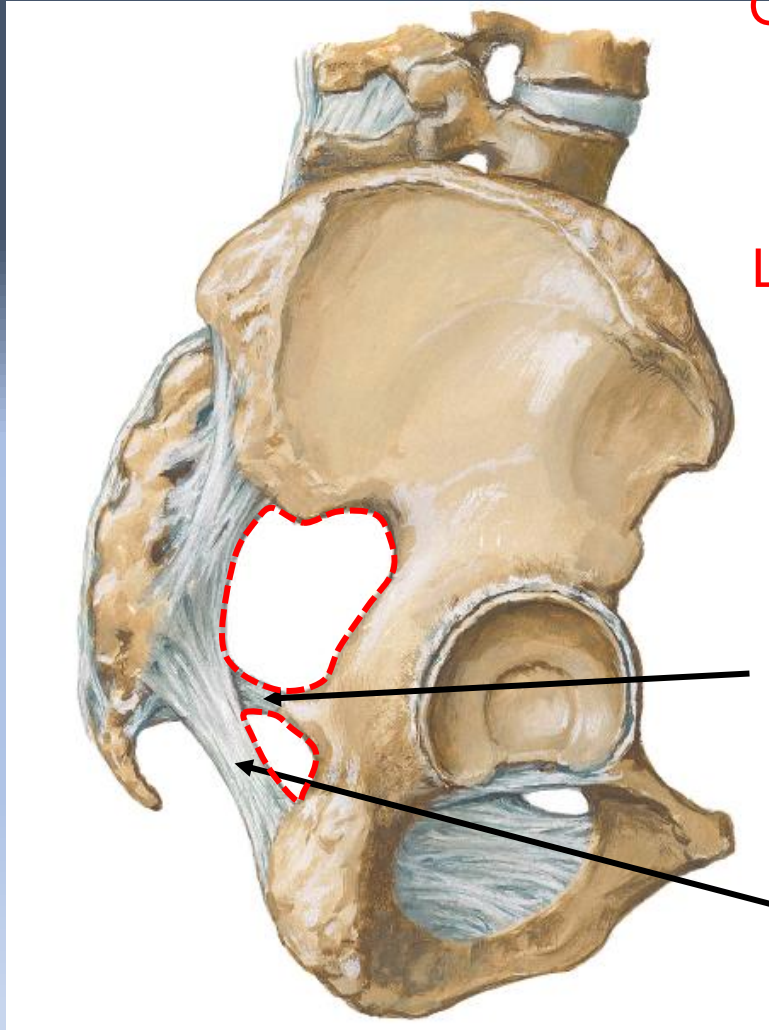
Pubis

- Forms the anterior part of acetabulum and the anteromedial part of hip bone
- The right & left pubis articulates at the **pubic symphysis**
- It has **superior & inferior pubic rami**
- The **pubic arch** is formed by **ischiopubic rami**



- **Pubic arch** is formed by the **ischiopubic rami** (bilaterally)
- These rami meet at the pubic symphysis, and their inferior borders define the **subpubic angle**
- **Subpubic angle** is the distance between the right and left ischial tuberosities





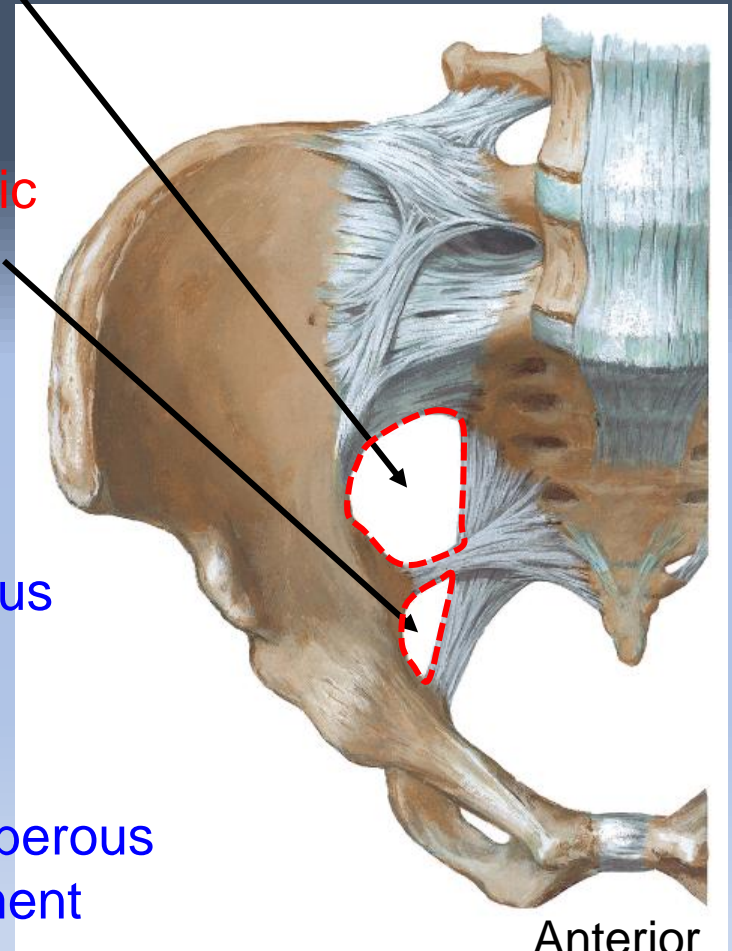
Lateral
view

Greater sciatic
foramen

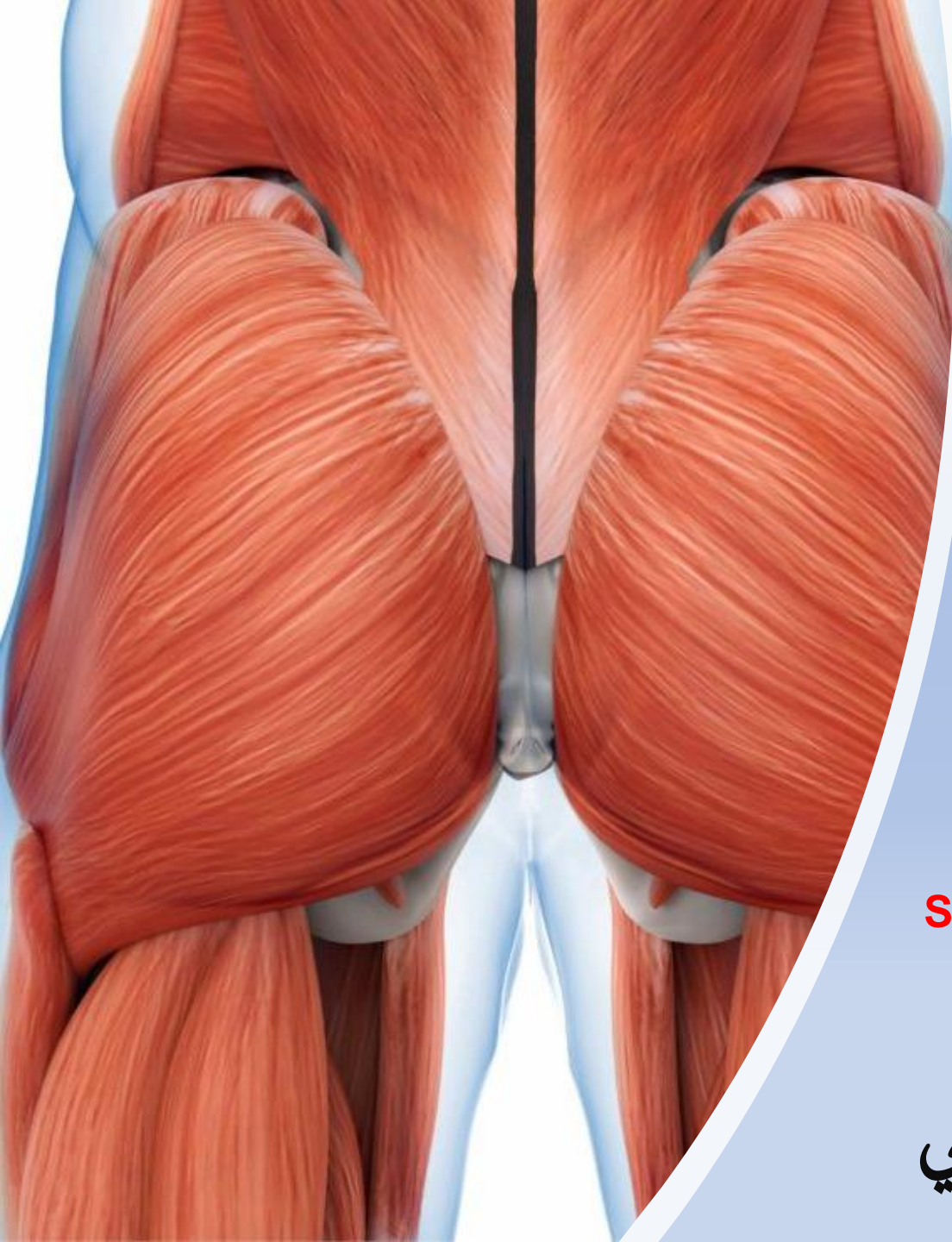
Lesser sciatic
foramen

Sacrospinous
ligament

Sacrotuberous
ligament



Anterior
view



Muscles in Gluteal Region

Superficial gluteal muscles
- Deep gluteal muscles

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Muscles of gluteal region

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graph TD; A[Muscles of gluteal region] --> B[Superficial layer]; A --> C[Deep layer]; B --> B1[1. Gluteal maximus]; B --> B2[2. Gluteal medius]; B --> B3[3. Gluteal minimus]; B --> B4[4. Tensor fasciae latae]; C --> C1[1. Piriformis]; C --> C2[2. Superior gemellus]; C --> C3[3. Inferior gemellus]; C --> C4[4. Obturator internus]; C --> C5[5. Quadratus femoris];
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Superficial layer

1. Gluteal maximus
2. Gluteal medius
3. Gluteal minimus
4. Tensor fasciae latae

Deep layer

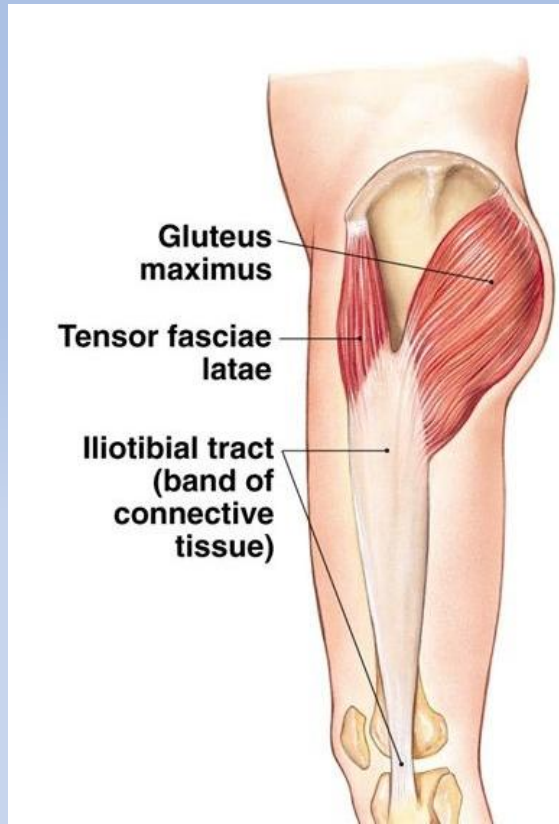
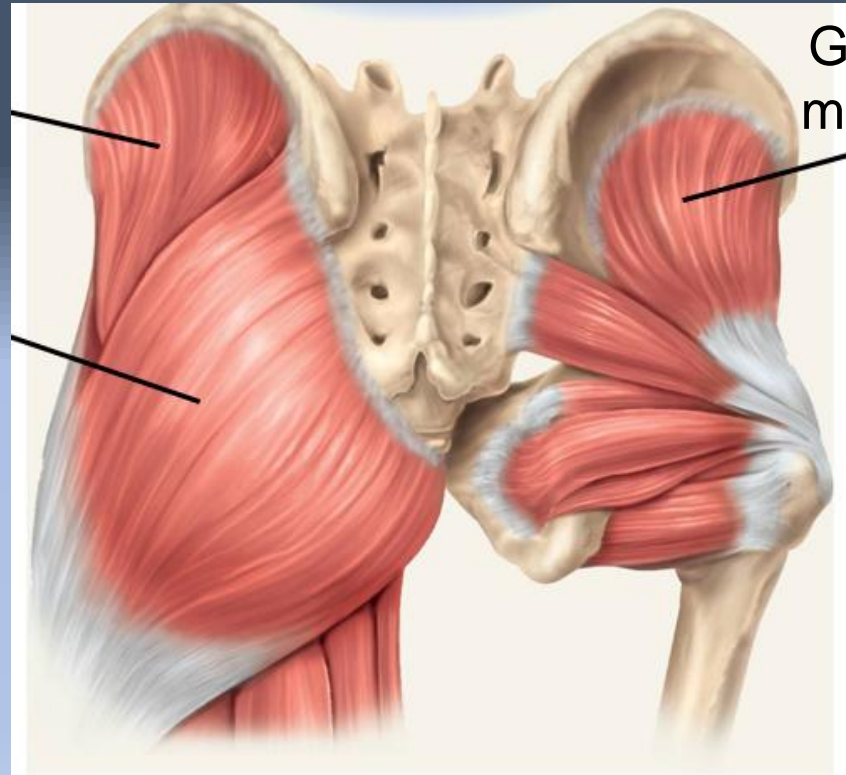
1. Piriformis
2. Superior gemellus
3. Inferior gemellus
4. Obturator internus
5. Quadratus femoris

Superficial gluteal muscles

Gluteus medius

Gluteus minimus

Gluteus maximus



1. Gluteus maximus

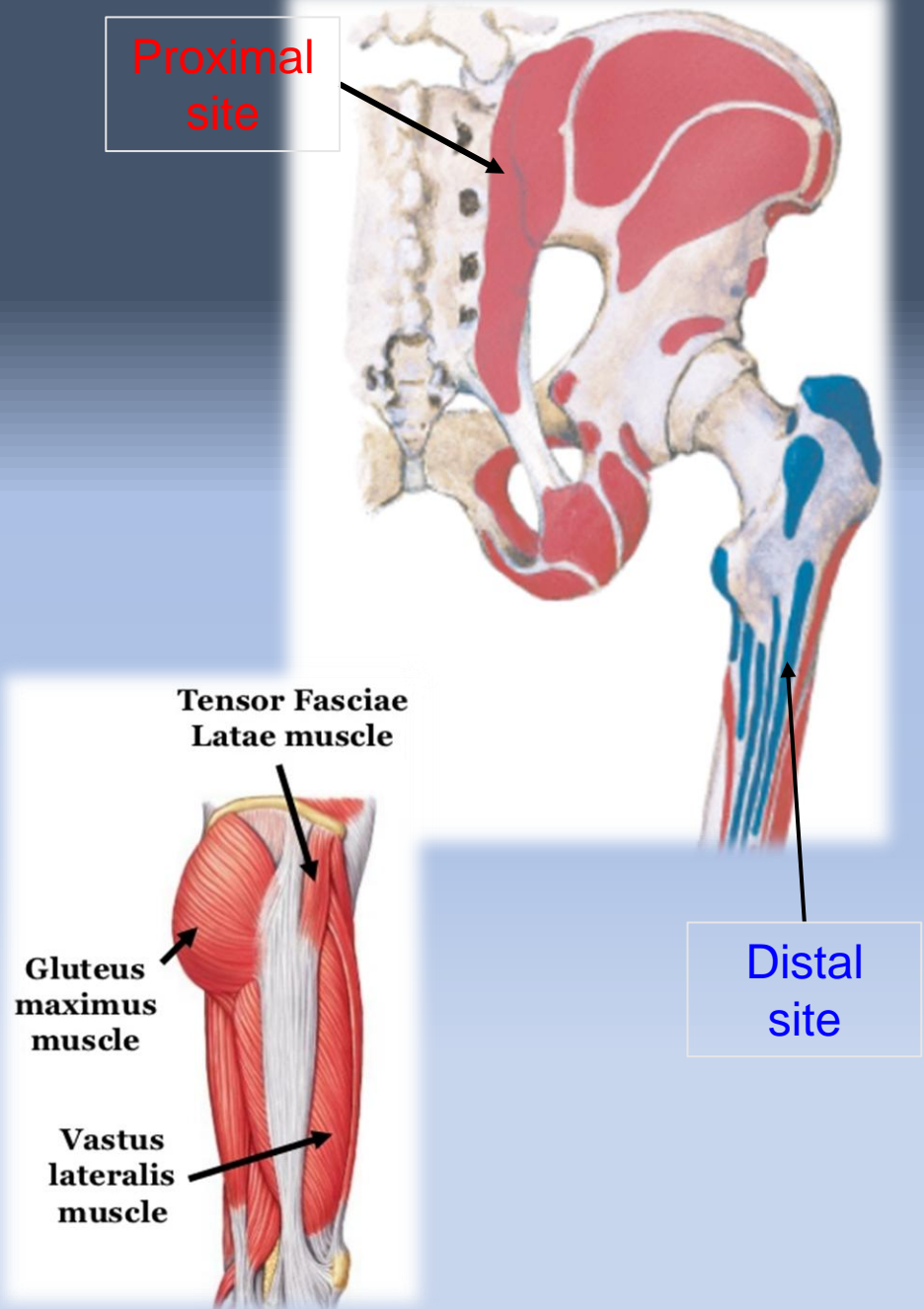
Proximal: posterior to posterior gluteal line, posterior superior iliac crest, posterior aspect of sacrum and coccyx and sacrotuberous ligament

Distal: fascia lata at the iliotibial band & gluteal tuberosity on posterior femur

Innervation: Inferior gluteal n. (L5, S1, S2)

Actions:

- Major extensor of hip joint
- Externally rotates hip



2. Gluteus medius

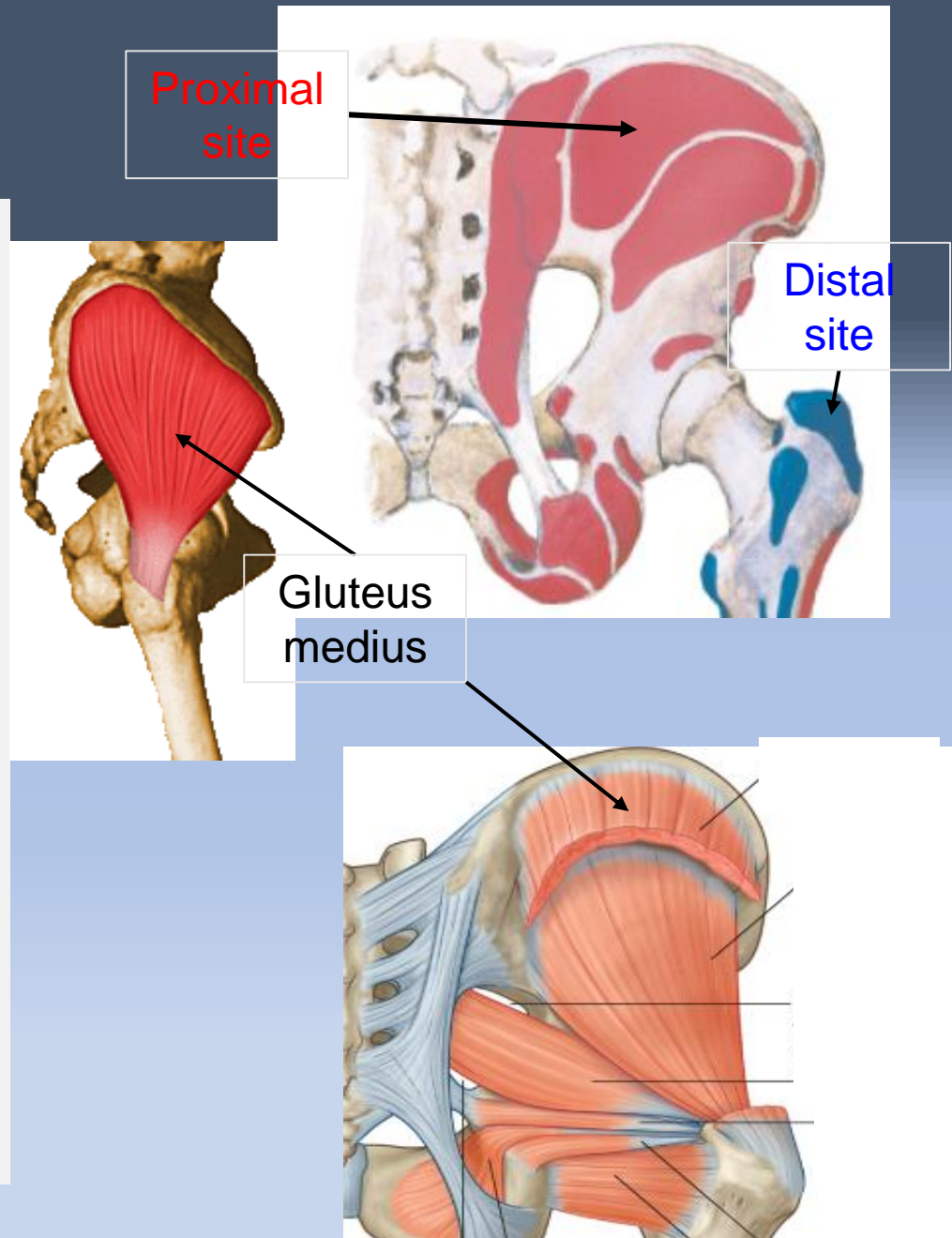
Proximal: external surface of ilium, inferior to iliac crest, **between anterior and posterior gluteal lines**

Distal: lateral surface of **greater trochanter**

Innervation: superior gluteal n. (L5, S1)

Actions:

- Major abductor of hip
- Rotate hip medially and internally



3. Gluteus minimus

Proximal: external surface of ilium, **between anterior and inferior gluteal lines**

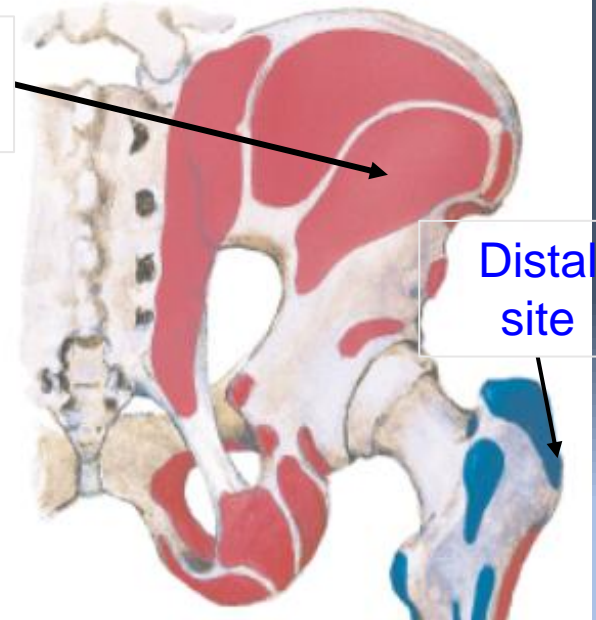
Distal: anterior surfaces of **greater trochanter**

Innervation: superior gluteal n. (L5, S1)

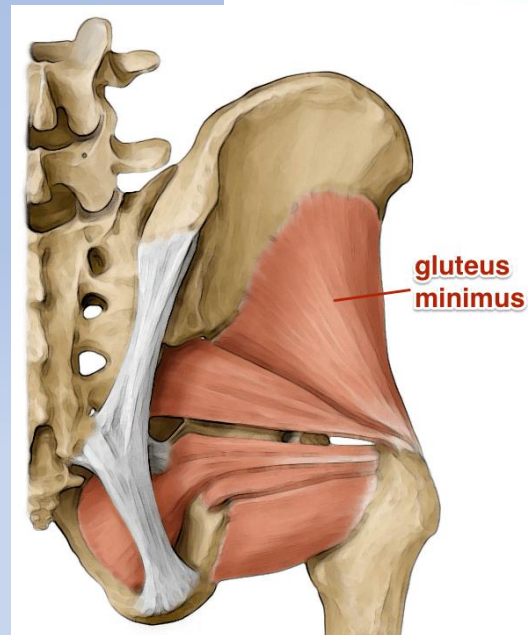
Actions:

Abducts and internally rotates the hip joint

Proximal site



Distal site



4. Tensor fasciae latae

Proximal: anterior superior iliac spine (**ASIS**)

Distal: iliotibial band/tract

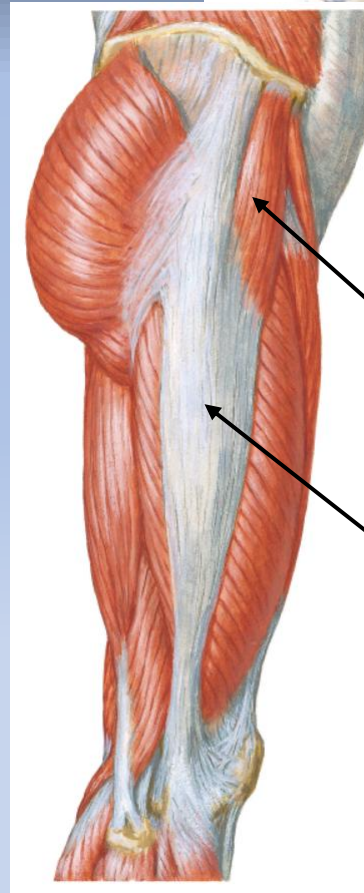
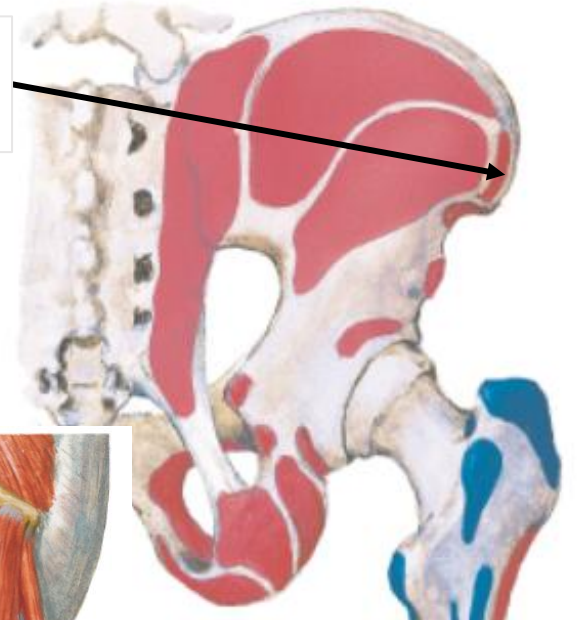
Innervation: superior gluteal n. (L5, S1)

Actions:

Abducts and internally rotates the hip joint

Helps stabilize and steady the hip and knee joints by putting tension on the iliotibial band of fascia

Proximal site



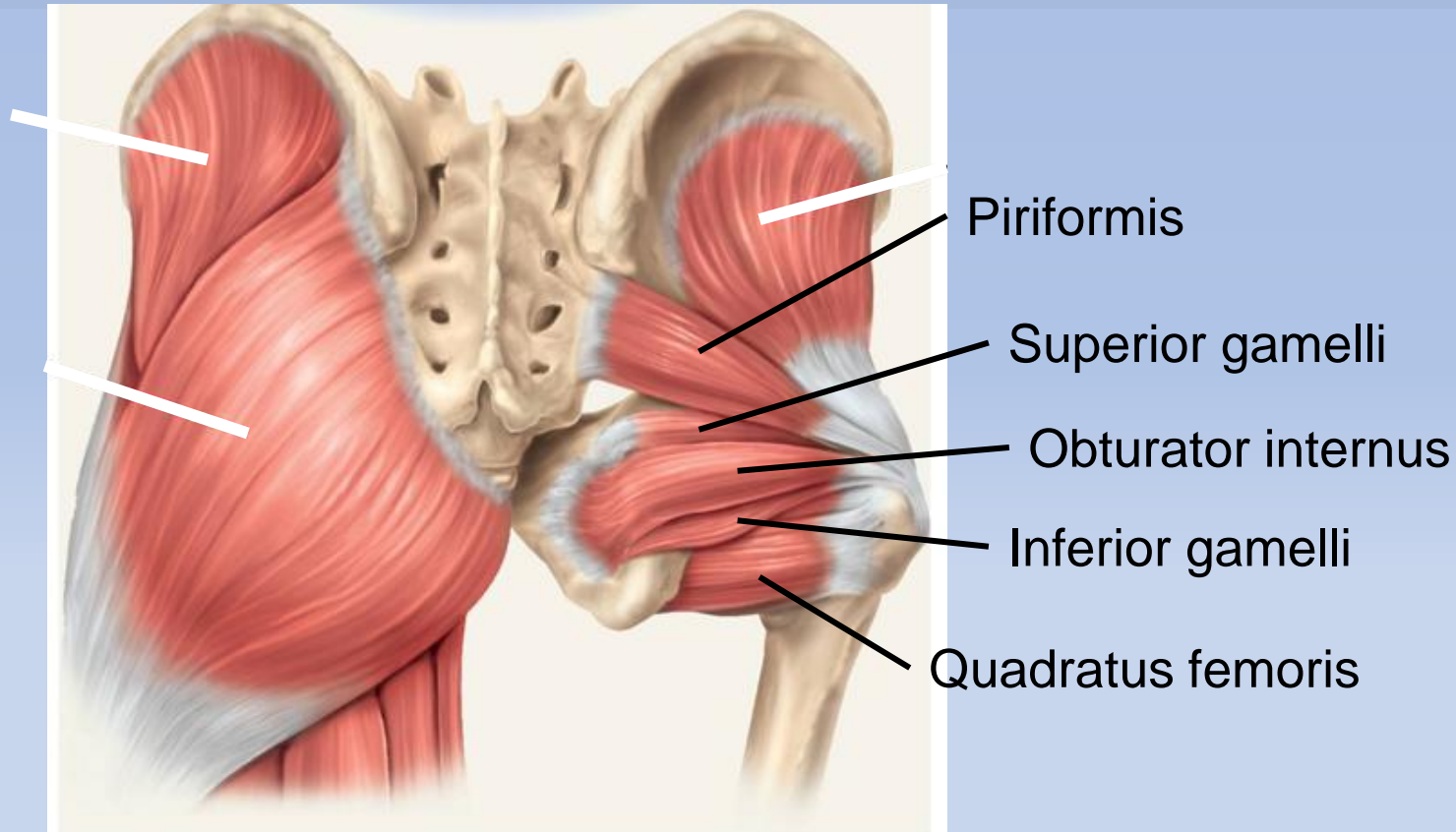
Tensor fasciae latae

Iliotibial tract

Deep gluteal muscles

All muscles are distally attached to the intertrochanteric crest (adjacent side) of femur

*These muscles are lateral rotators of thigh, stabilize **hip joint** & to steady **femoral head** in the acetabulum*



1. Piriformis

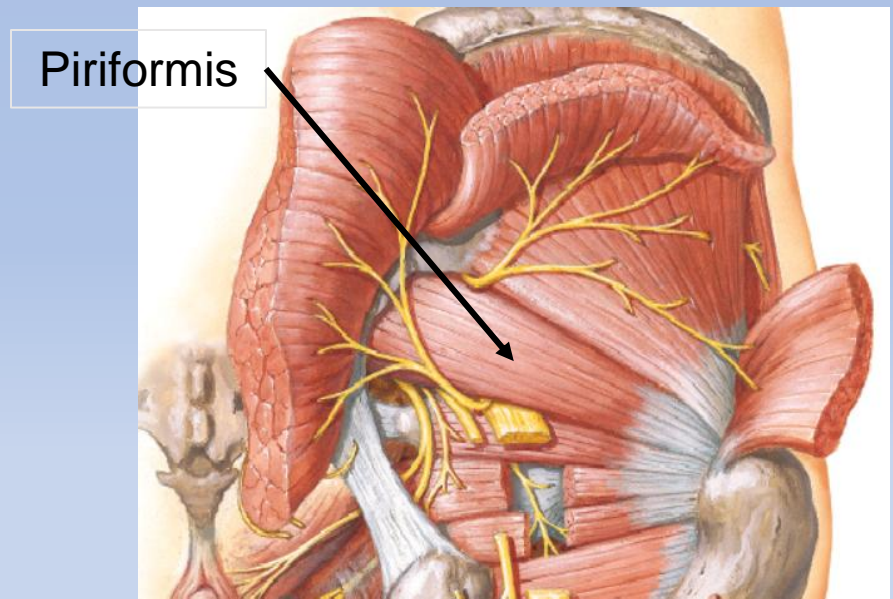
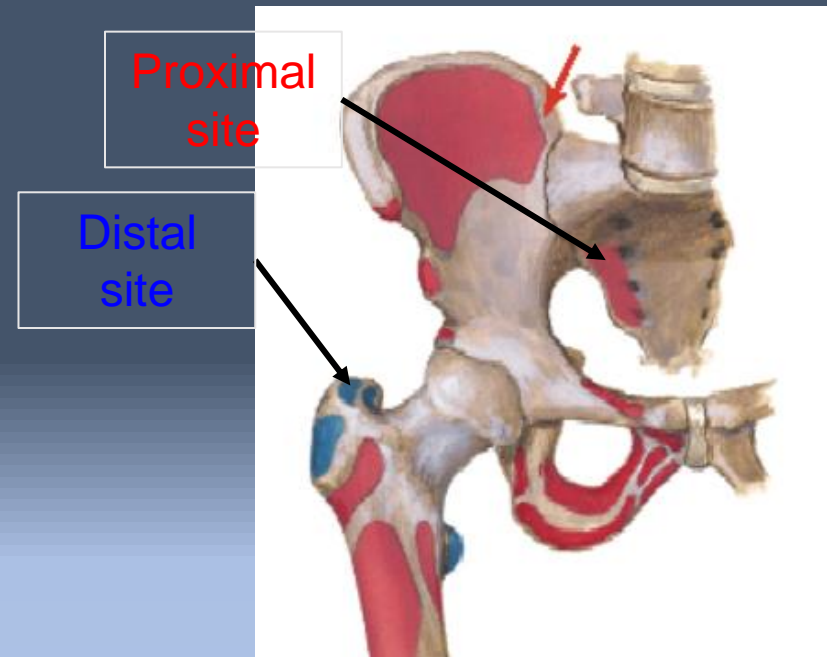
Proximal: anterior surface of sacrum, on sacrotuberous ligament

Distal: superior border of greater trochanter of femur

Innervation: branches of S1 & S2 (anterior rami)

Actions:

- Laterally rotates the extended thigh at hip joint
- Abducts flexed thigh at hip joint
- Stabilizes head of femur



2. Superior gamellus

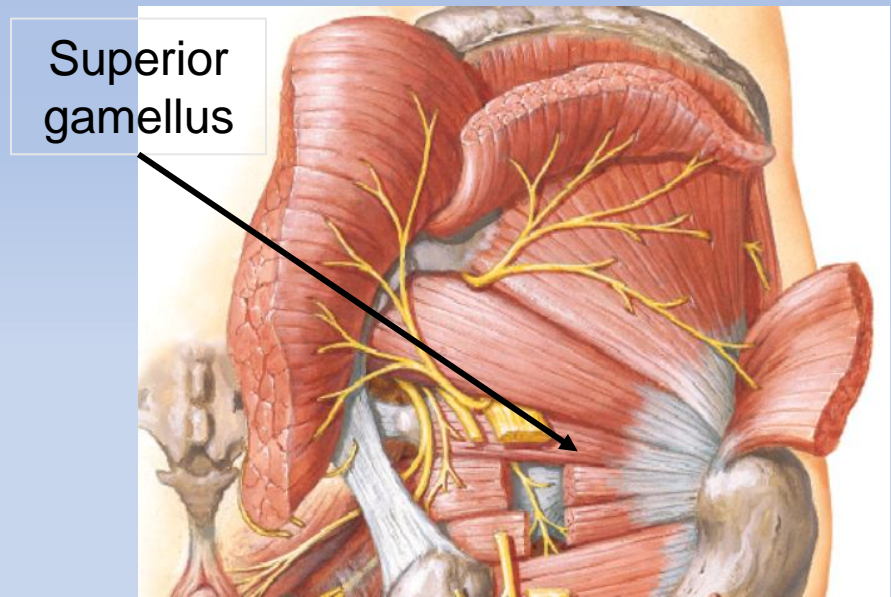
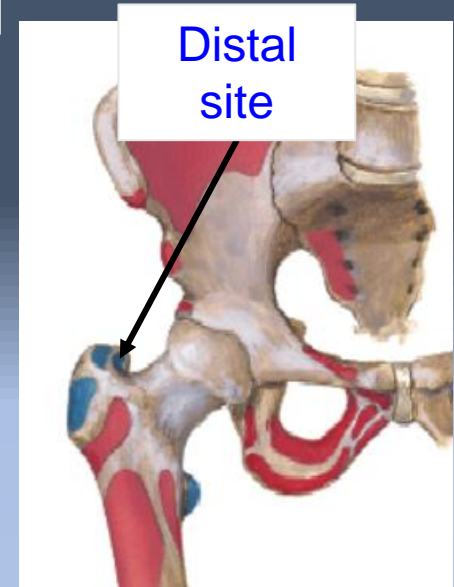
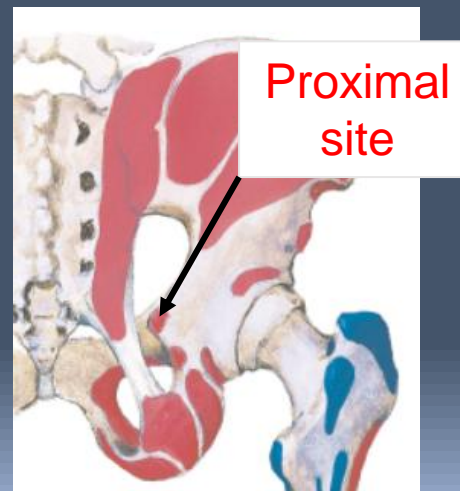
Proximal: ischial spine

Distal: medial surface of greater trochanter of femur

Innervation: nerve to obturator internus (L5, S1)

Actions:

- Laterally rotates the extended thigh at hip joint
- Abducts flexed thigh at hip joint
- Stabilizes head of femur (same as piriformis)



3. Inferior gamellus

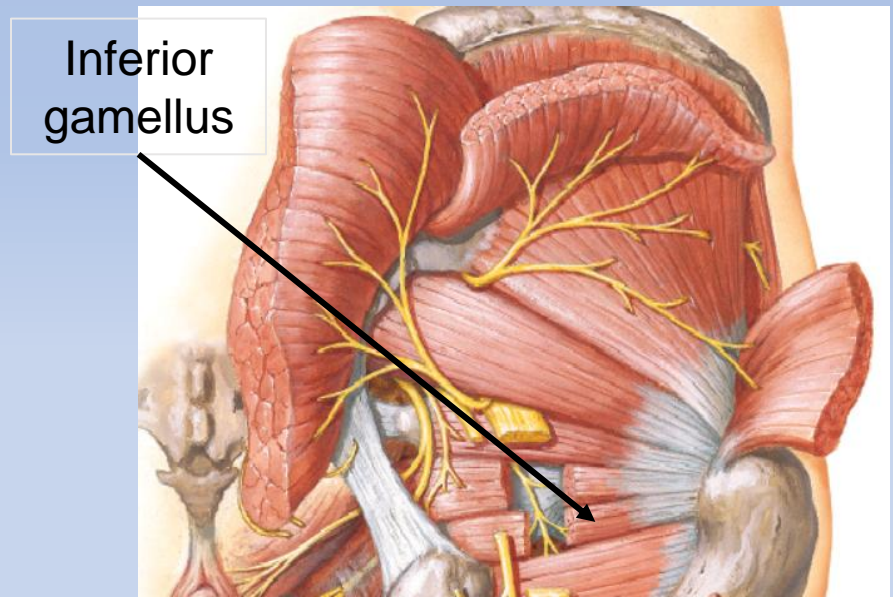
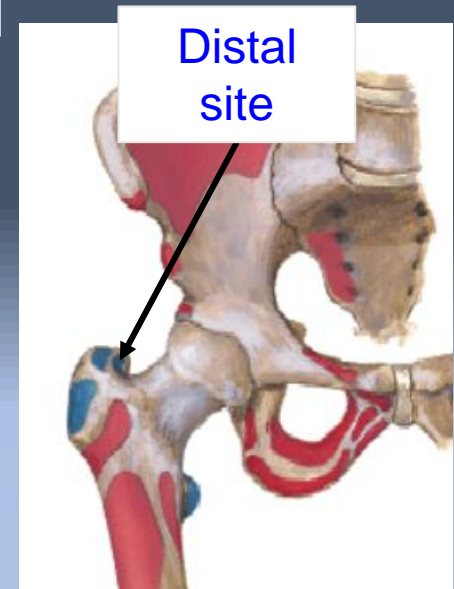
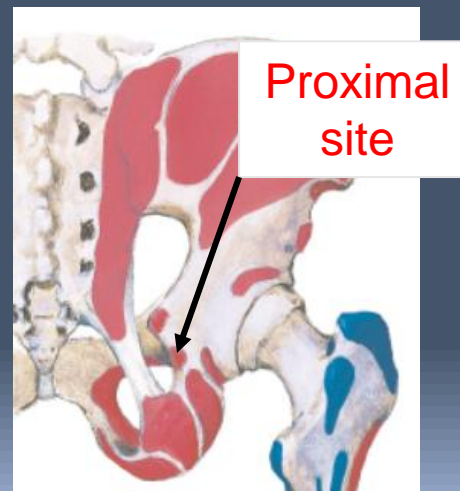
Proximal: ischial tuberosity

Distal: medial surface of greater trochanter of femur

Innervation: nerve to quadratus femoris (L5, S1)

Actions:

- Laterally rotates the extended thigh at hip joint
 - Abducts flexed thigh at hip joint
 - Stabilizes head of femur
- (same as piriformis & superior gamellus)



4. Obturator internus

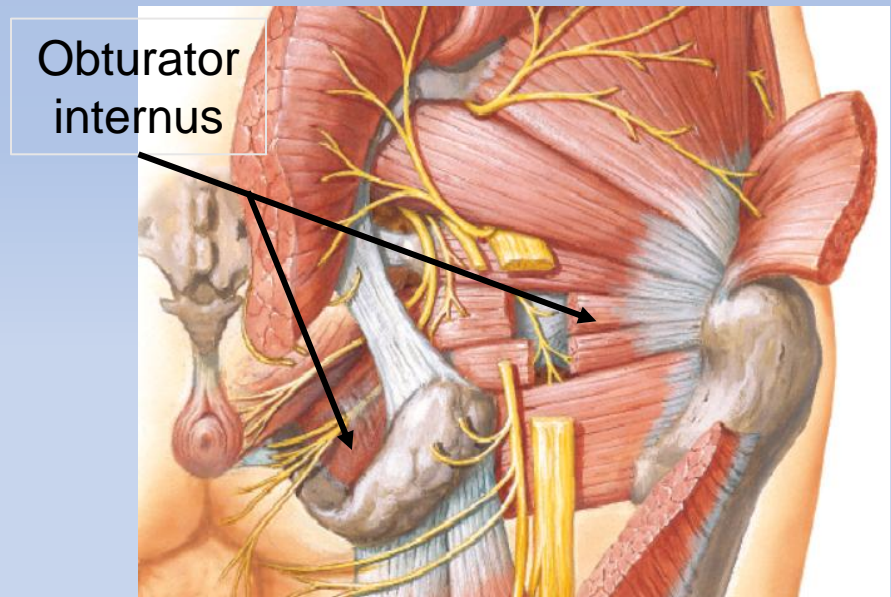
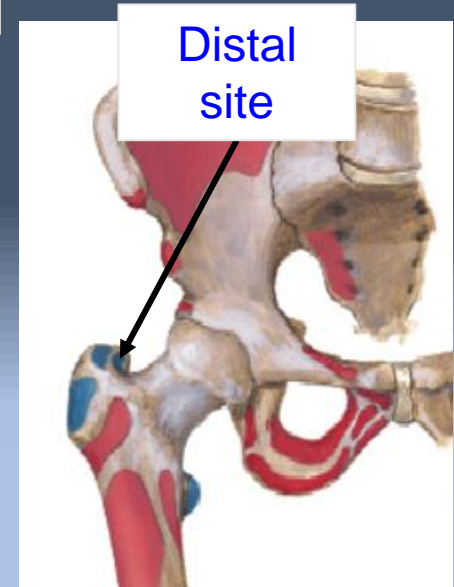
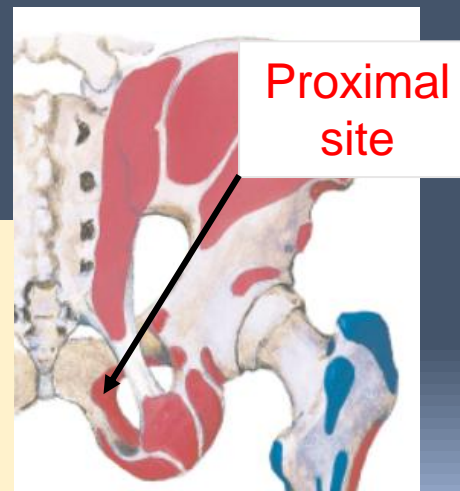
Proximal: pelvic/deep **surface of obturator membrane** & surrounding bones

Distal: **medial surface** of **greater trochanter** of femur

Innervation: nerve to obturator internus (L5, S1)

Actions:

- Laterally rotates the extended thigh at hip joint
 - Abducts flexed thigh at hip joint
 - Stabilizes head of femur
- (same as piriformis & gemelli msls)



5. Quadratus femoris

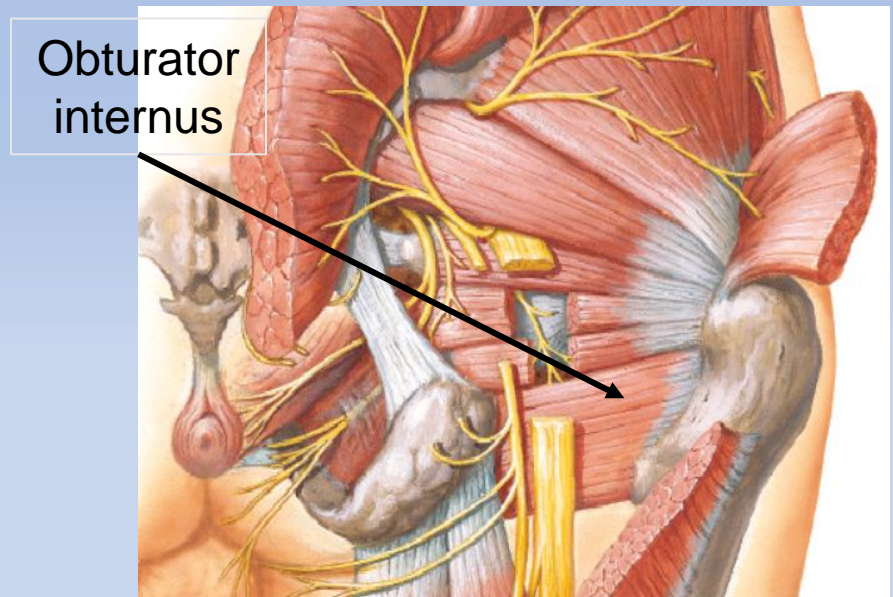
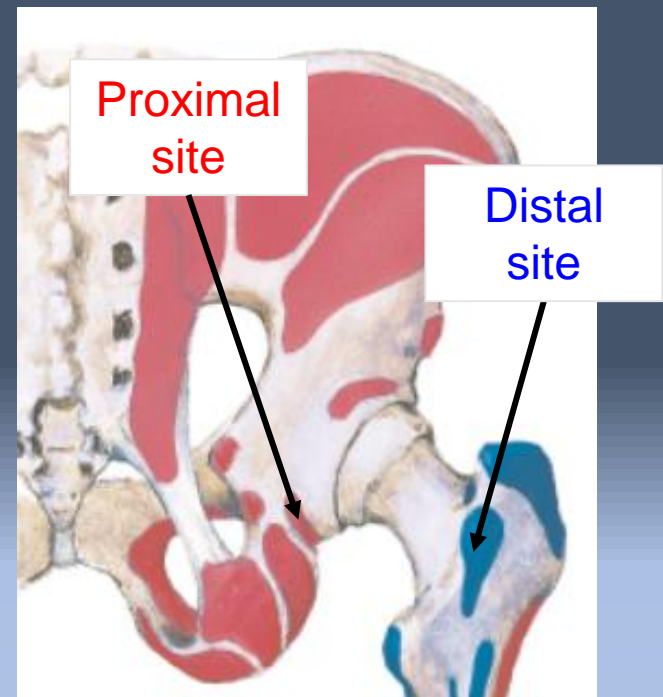
Proximal: lateral border of ischial tuberosity

Distal: quadrate tubercle on intertrochanteric crest of femur

Innervation: nerve to quadratus femoris (L5, S1)

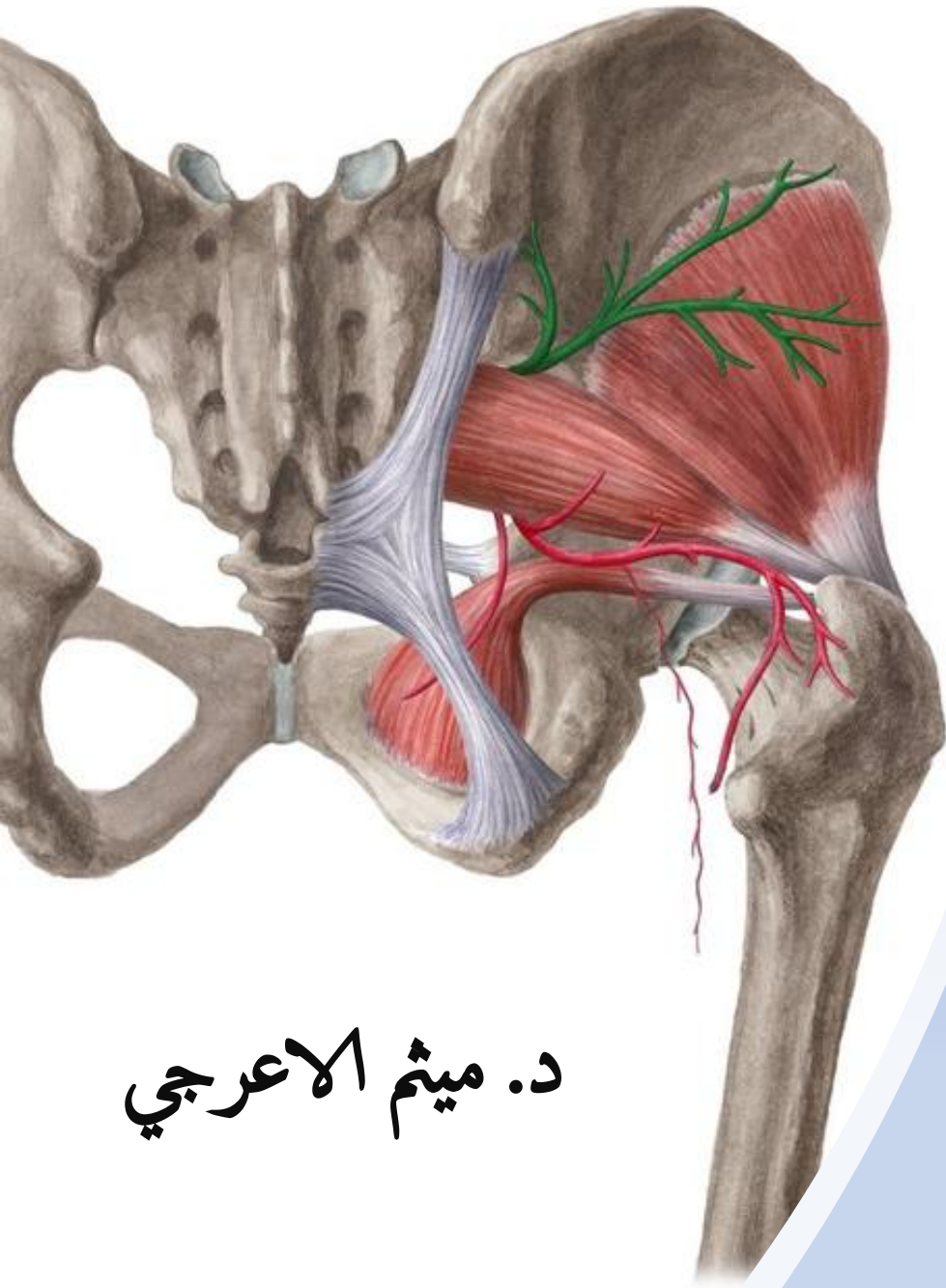
Actions:

- Laterally rotates the extended thigh at hip joint
- Abducts flexed thigh at hip joint
- Stabilizes head of femur (same as piriformis & gemelli msls)



Muscle	Proximal	Distal	Innervation	Main action
Gluteus maximus	<ul style="list-style-type: none"> Posterior gluteal line (ilium) Dorsal surface of sacrum & coccyx Sacrotuberous ligament 	<ul style="list-style-type: none"> Iliotibial tract Gluteal tuberosity 	Inferior gluteal nerve	Extension & lateral rotation of thigh
Gluteus medius	<ul style="list-style-type: none"> External surface of ilium (btwn anterior & posterior gluteal lines) 	Greater trochanter (lateral surface)	Superior gluteal nerve	Abduction Medial rotation of thigh
Gluteus minimus	<ul style="list-style-type: none"> External surface of ilium (btwn anterior & inferior gluteal line) 	Greater trochanter (anterior surface)		
Tensor fasciae latae	<ul style="list-style-type: none"> ASIS Iliac crest (anterior part) 	Iliotibial tract (lateral condyle of femur)		

Muscle	Proximal	Distal	Innervation	Main action
Piriformis	<ul style="list-style-type: none"> Sacrum (anterior surface) Sacrotuberous ligament 	Greater trochanter (superior border)	Branches of anterior rami of S1, S2	
Superior & inferior gemelli	<ul style="list-style-type: none"> Superior: ischial spine Inferior: ischial tuberosity 	Greater trochanter (medial surface)	Superior: Nerve to obturator internus (L5, S2) Inferior: Nerve to quadratus femoris (L4, S1)	Lateral rotation & abduction of thigh
Obturator internus	Pelvic surface of obturator membrane and surrounding bones	Greater trochanter (medial surface)	Nerve to obturator internus (L5, S2)	
Quadratus femoris	Ischial tuberosity (lateral border)	Intertrochanteric crest (quadratus tubercle)	Nerve to quadratus femoris (L4, S1)	



Arteries of Gluteal Region

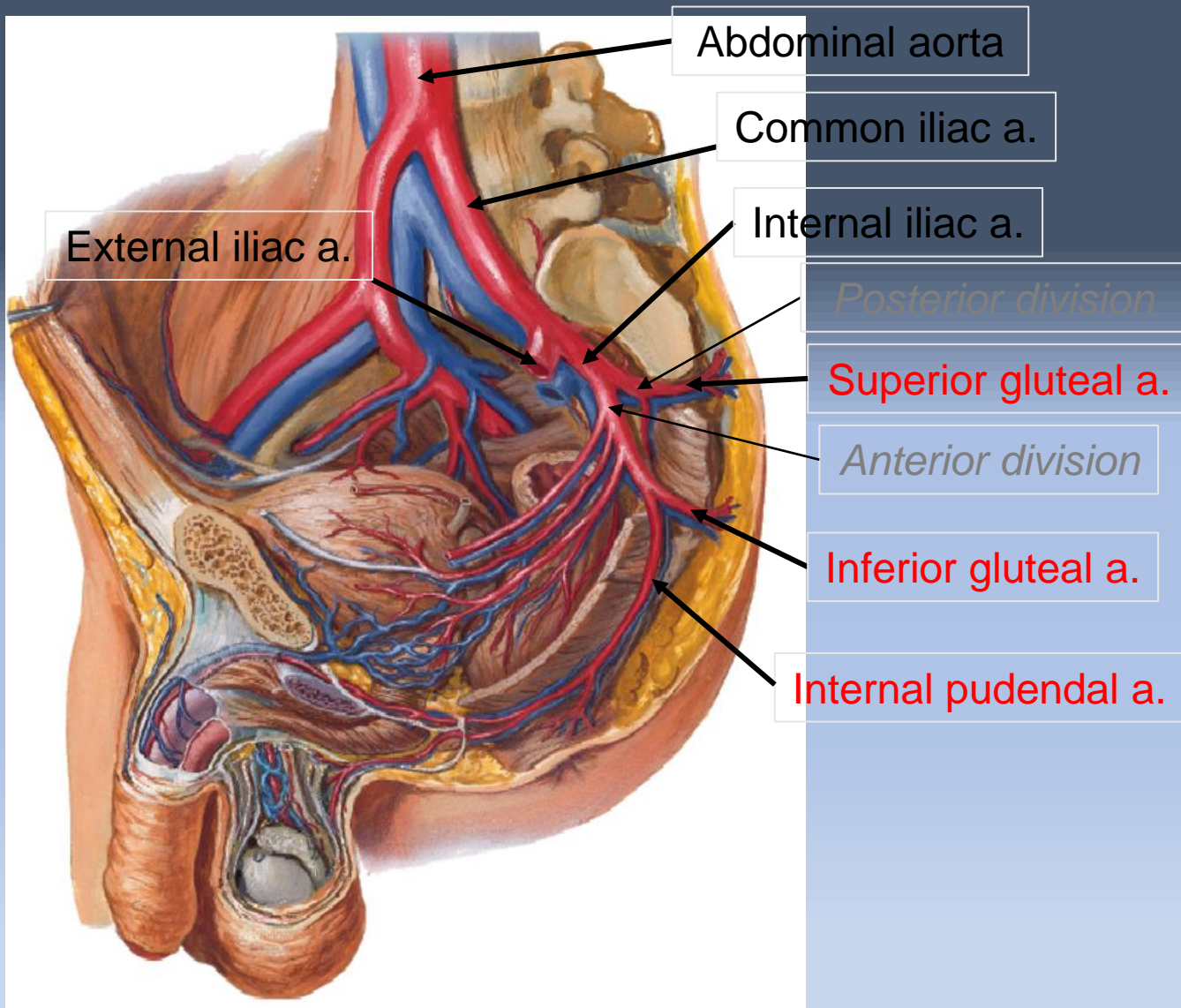
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Arterial supply of gluteal region

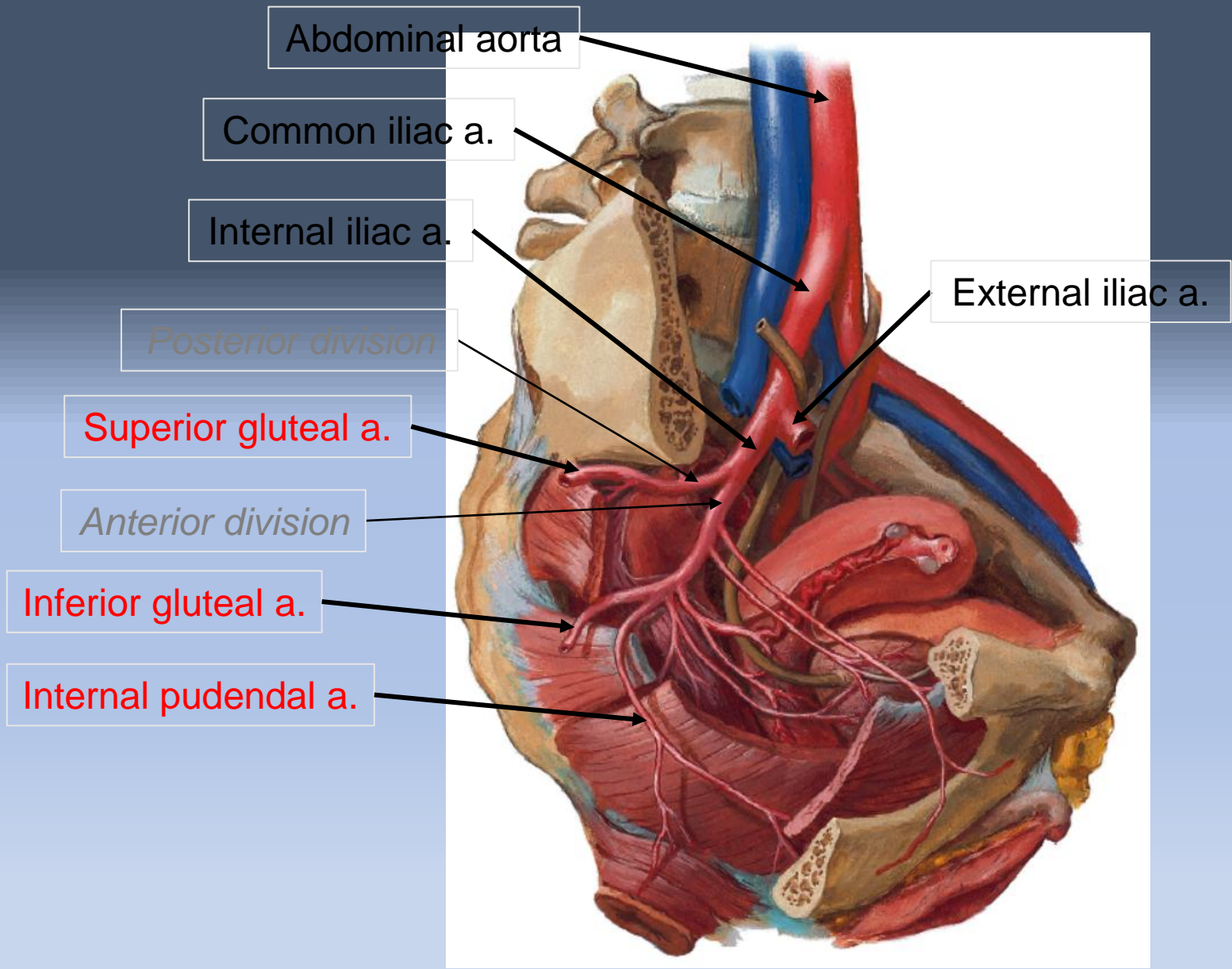
Source: 3 main **branches** of **internal iliac artery**

(supply and traverse the pelvic structure)

- i. Superior gluteal artery**
- ii. Inferior gluteal artery**
- iii. Internal pudendal artery**



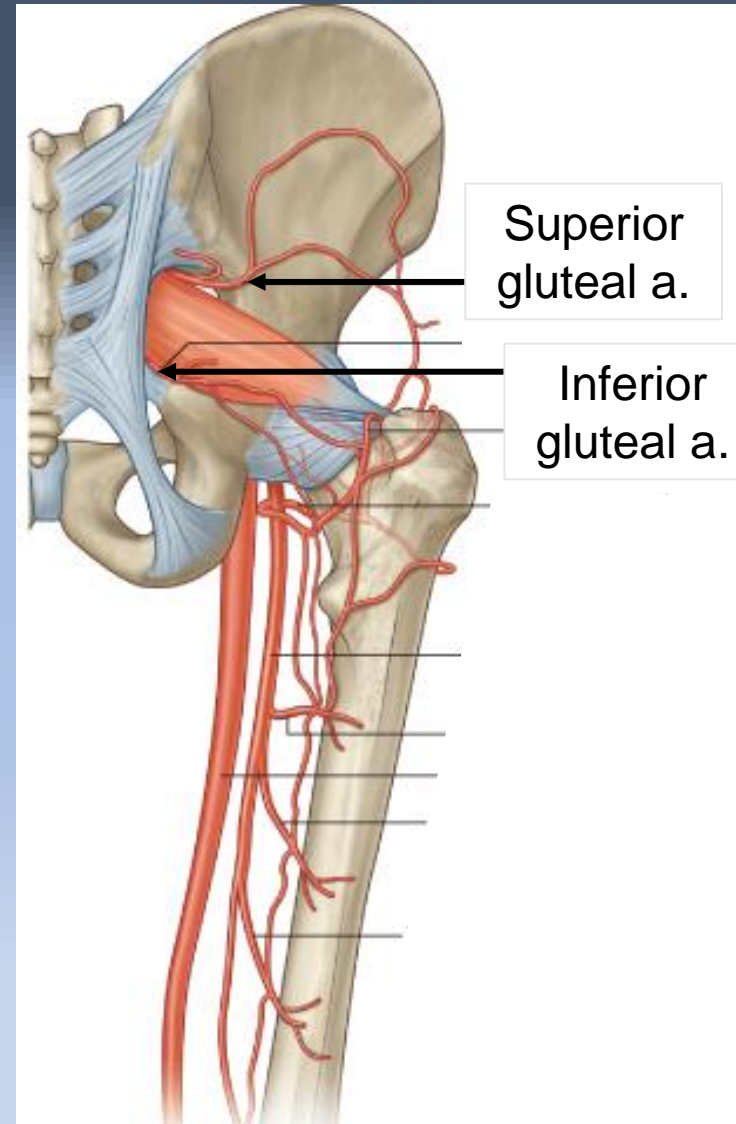
*Left paramedian section,
lateral view (male)*

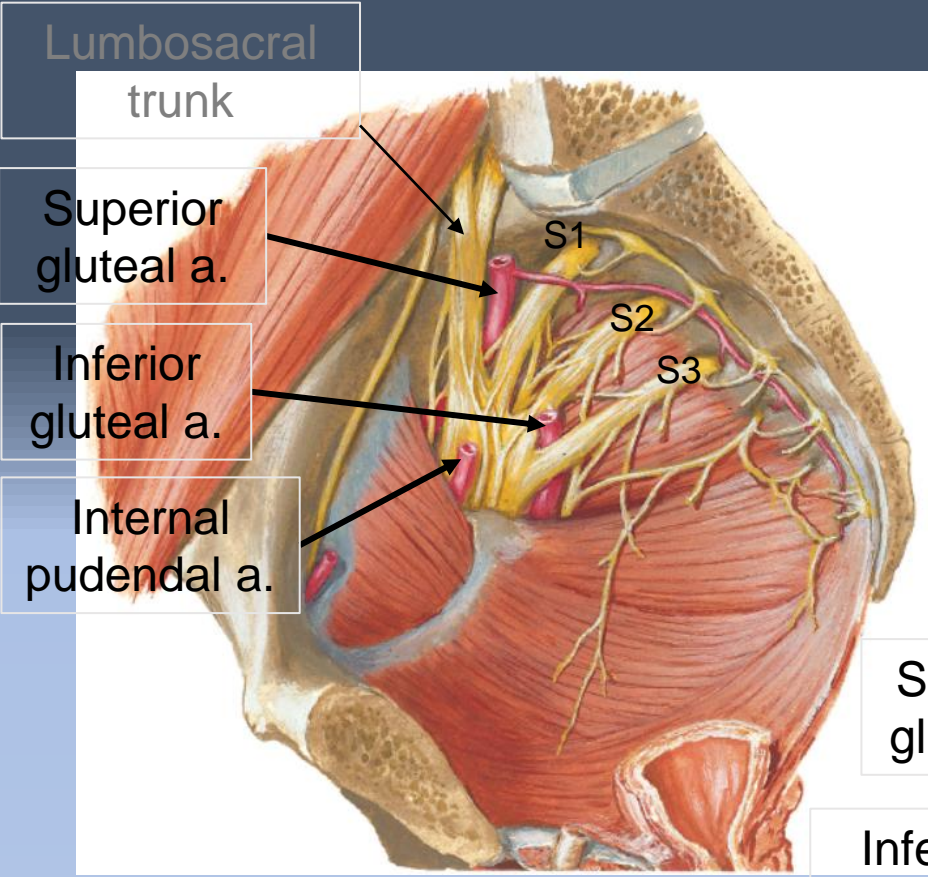


*Right paramedian section,
lateral view (female)*

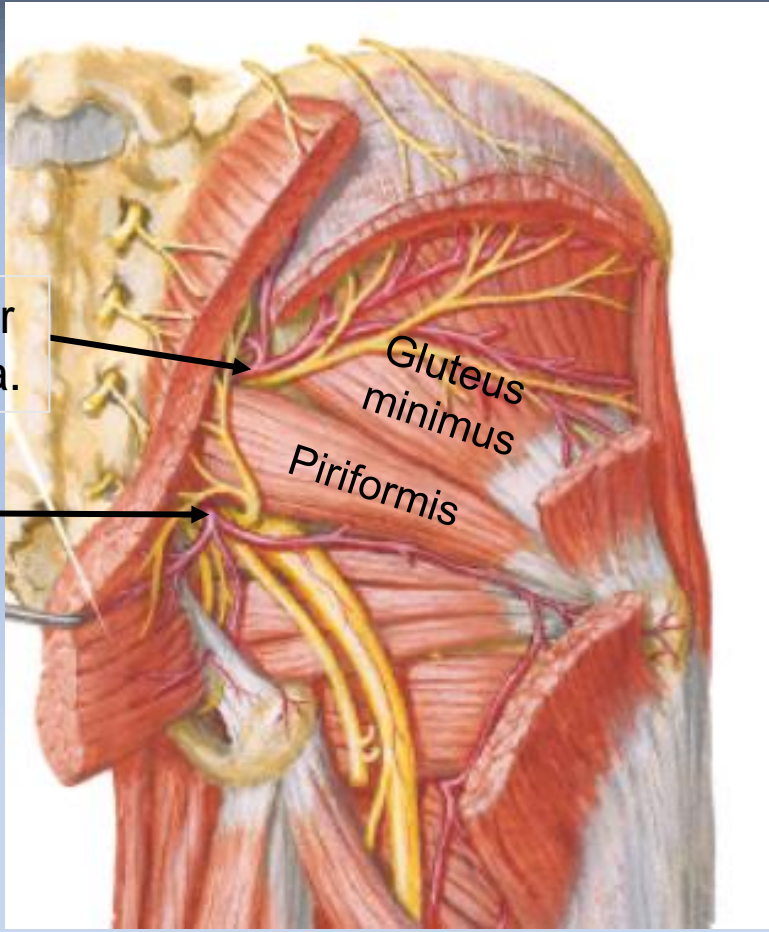
Gluteal artery

- **Superior-** and **inferior gluteal artery** enter gluteal region from pelvic cavity through **greater sciatic foramen**
- They supply structures in the gluteal region and posterior thigh
- Have important **collateral anastomoses** with branches of the **femoral artery**





Hemisected pelvis: medial & slightly anterior view



Gluteal region – deep layer

Superior gluteal artery

- Largest branch of internal iliac artery
- Passes between **lumbosacral trunk** & **S1** nerve
- Exits pelvis through greater sciatic foramen, **superior** to piriformis
- **Divides** into deep and superficial branches.

Distribution

Superficial: gluteus maximus
Deep: gluteus medius, gluteus minimus, tensor fasciae latae

Inferior gluteal artery

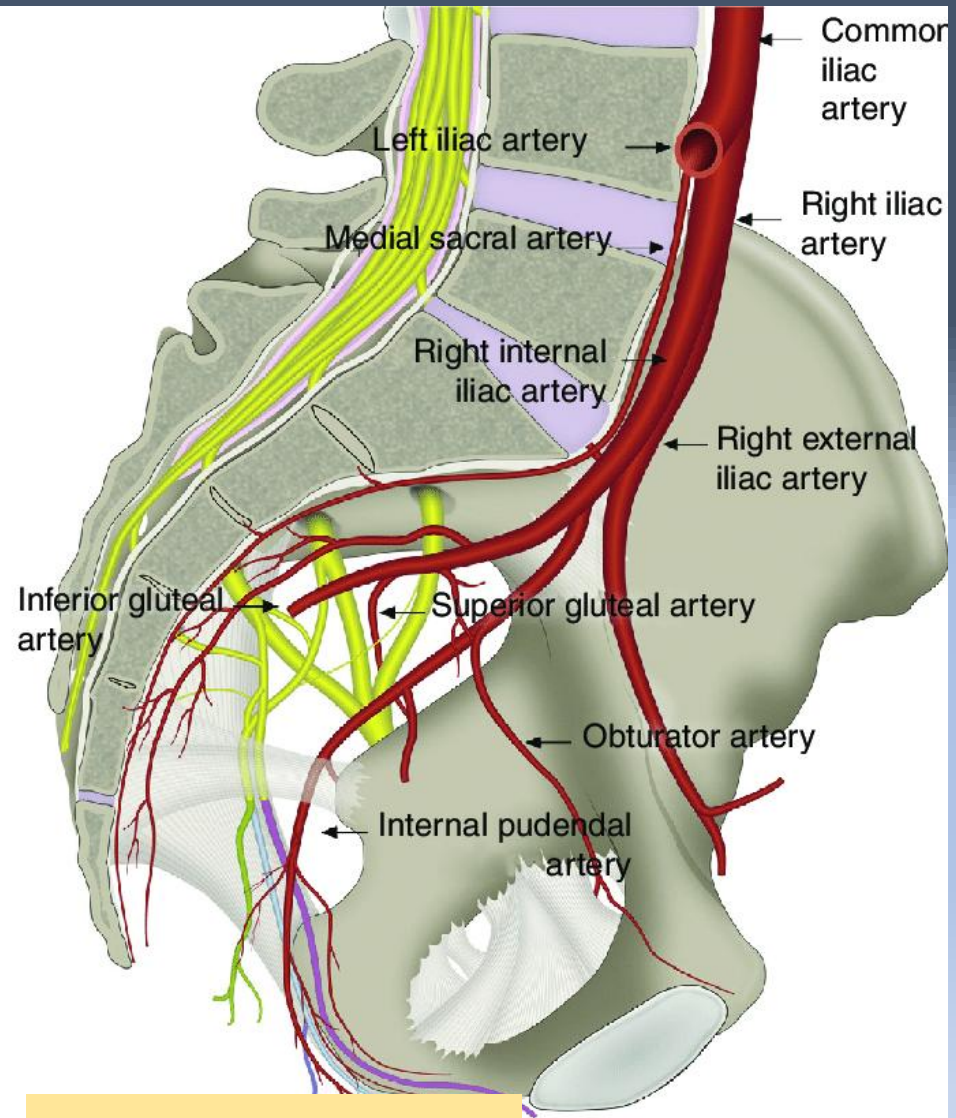
- Arises from internal iliac artery
- Passes between **S1 & S2** nerves (variation: S2 & S3)
- Exits pelvis through greater sciatic foramen, **inferior** to piriformis
- Involves in the **cruciate anastomosis of the thigh**

Distribution

Gluteus maximus, obturator internus, quadratus femoris, superior part of hamstrings

Internal pudendal artery

- Arises from internal iliac artery
- Enters gluteal region through greater sciatic foramen, **inferior** to piriformis
- It **exits immediately** through lesser sciatic foramen by **crossing** the ischial spine/sacrospinous ligament
- **Does not** supply any structures in gluteal region or posterior thigh



Distribution

External genitalia
& perineal muscles