# ANATOMY OF THE

# *Lower Limb*

*Professor*

*Nawfal K. Al-Hadithi*

## Gluteal region


-To describes the gluteal region

-To list its muscles, vessels & nerves

-To specify the site of injection

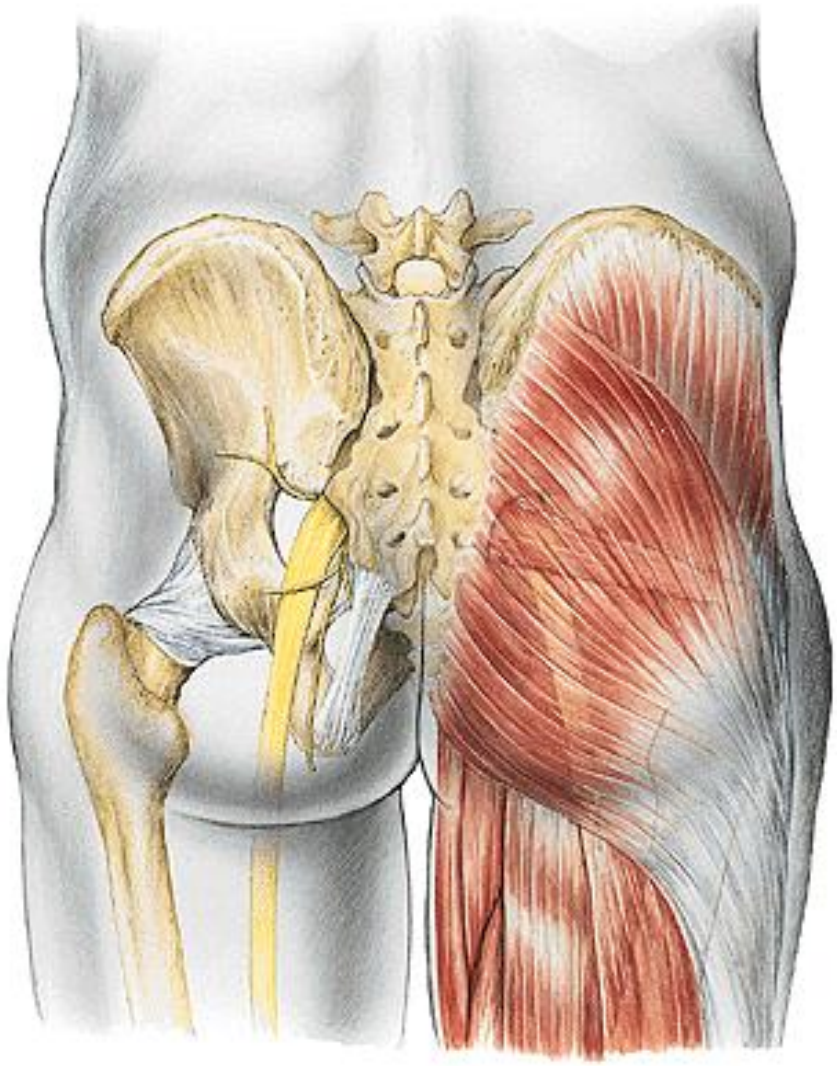
-To demonstrate some important pathologies affecting the structures in the region

-This region is anatomically related to the trunk & functionally to the LL

-It is bounded by the iliac crest above & G fold below

-Muscles in the region are mainly extensors, abductors & lateral rotators of the femur on the hip

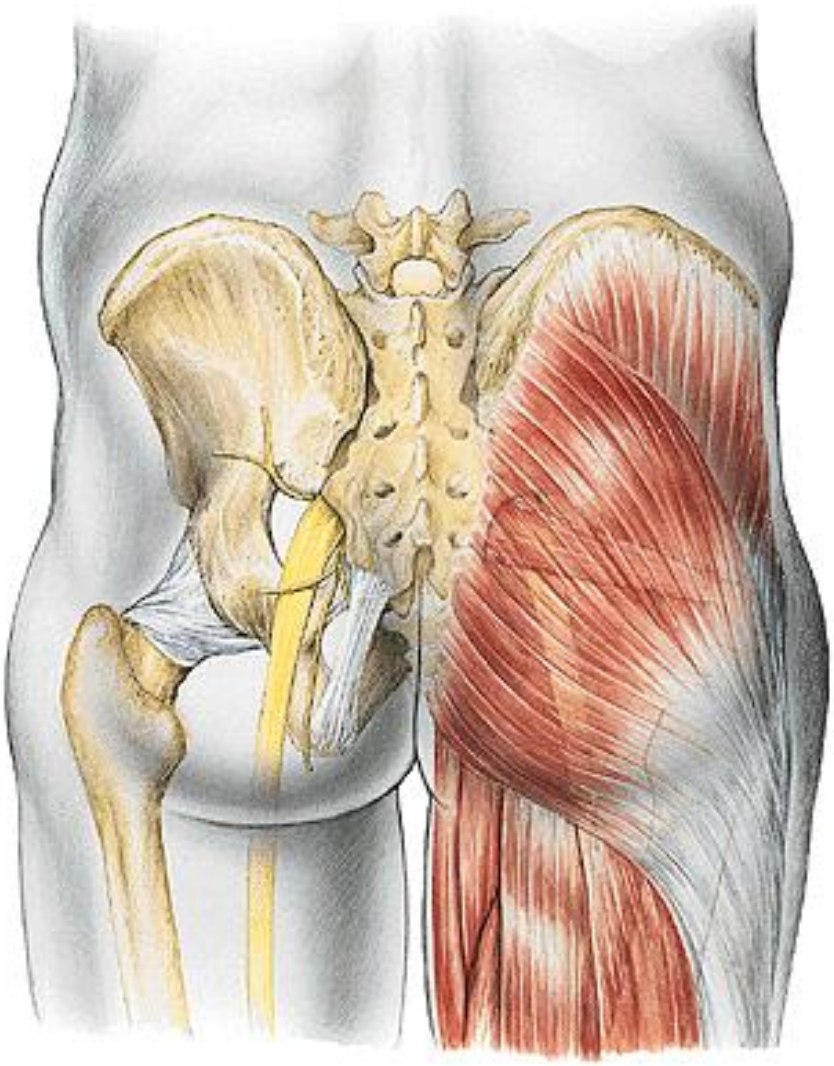
-The region communicates with the pelvic cavity and perineum through the greater and lesser sciatic foramina

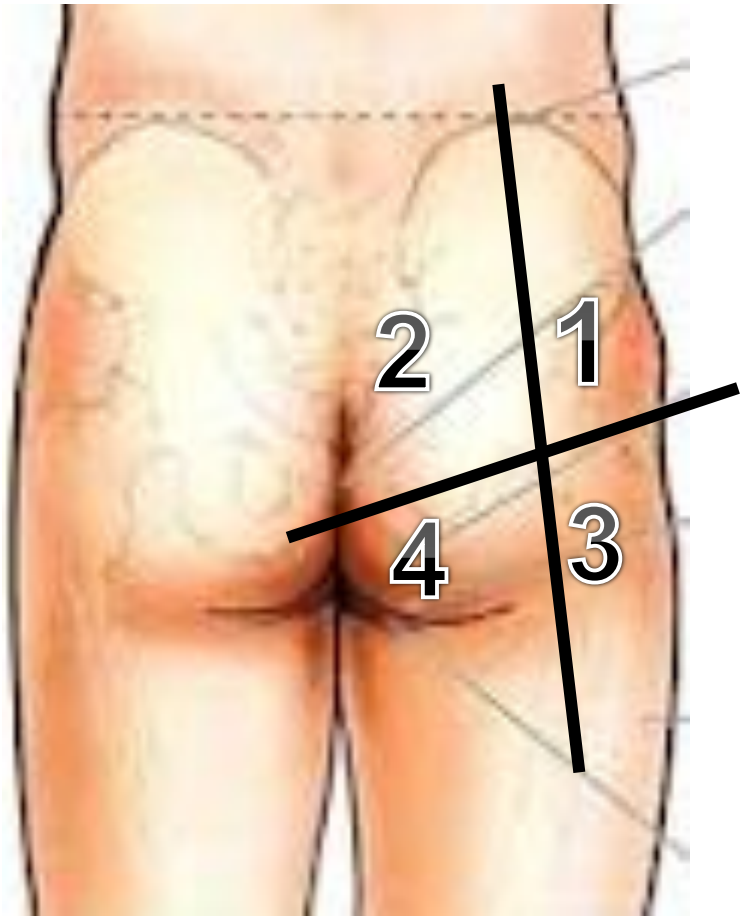


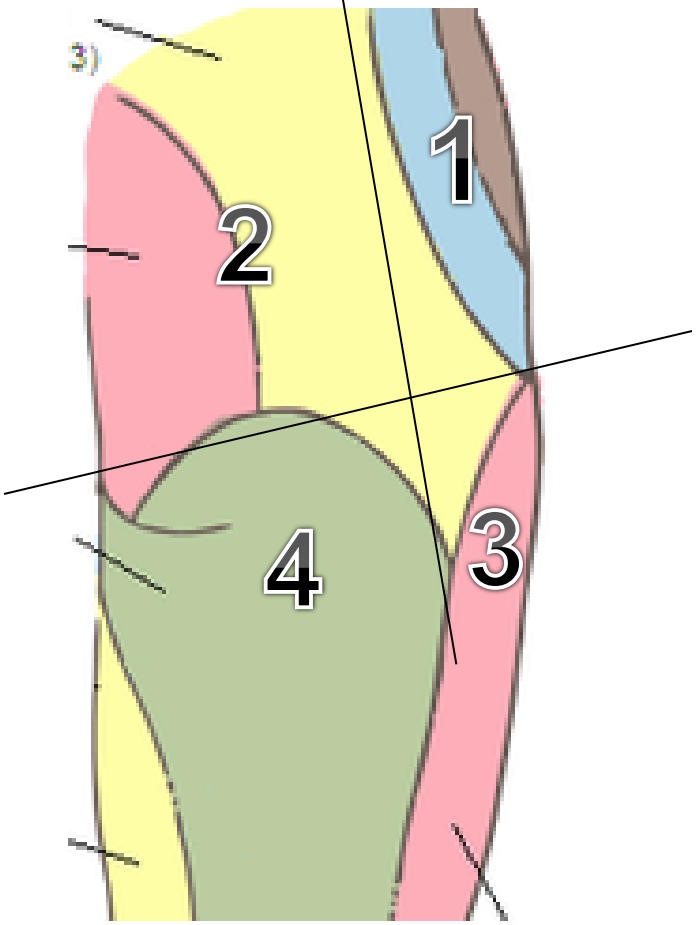
-Inferiorly, it is continuous with the posterior thigh (hamstring comp).

-The sciatic nerve enters the lower limb after crossing the inferomedial part of the G region

-The subcutaneous fat is well developed in this region as it is the site where one sits on






# Cutaneous nerves

1- Subcostal (T12) & iliohypogastric (L1)

2- Superior cluneal (L1,2,3) & middle cluneal (S1,2,3)

3- LFCT (L2,3)

4- PFCN (S2,3)

## Muscle arrangement:

-**The outermost & bulkiest is the gluteus maximus**

-**Next is the G medius**

-**After removing G medius a series of muscles appear they are from above downward:**

**G minimus, piriformis, gemellus superior, obturator internus, G inferior the quadratus femoris**

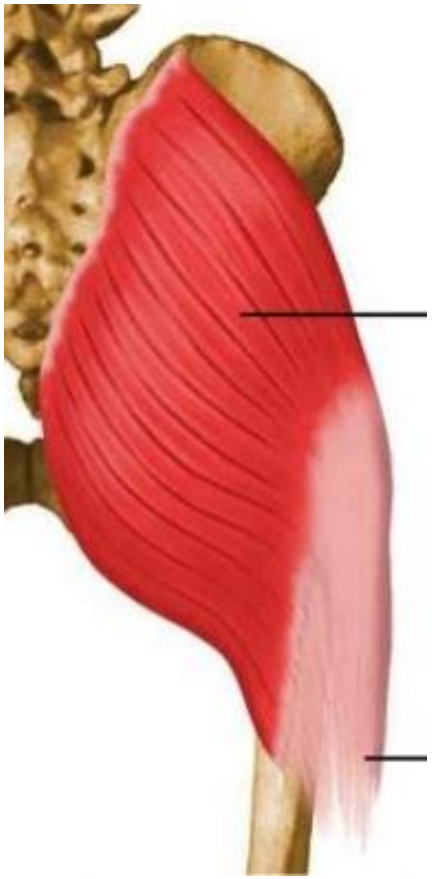
-**Tensor fascia latae lies anterior to the glutei, lateral to the ASIS**

## Tensor fascia latae:

| Origin | Insertion | Innervation | Action |
|---|---|---|---|
| Lateral aspect of iliac crest | Iliotibial tract | Superior gluteal n. L4,5,S1 | Stabilizes the extended knee |

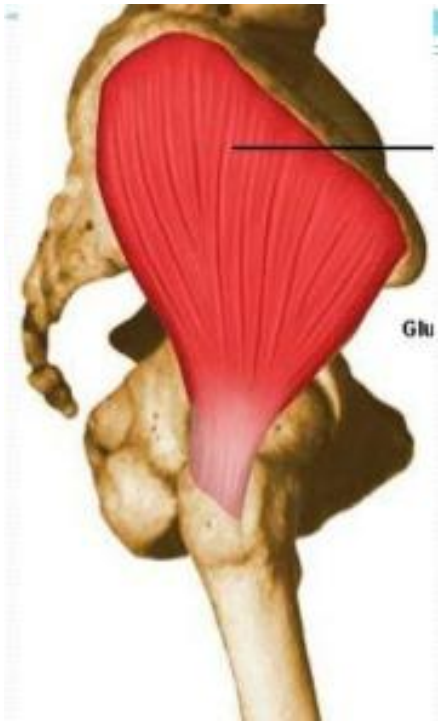
## Gluteus maximus:

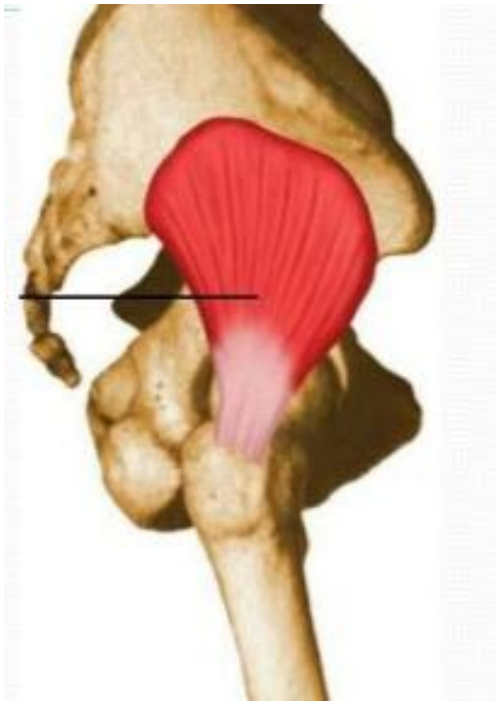
| Origin | Insertion | Innervation | Action |
|---|---|---|---|
| - Outer surface of ilium<br>- Adjacent sacrum & STL | G tuberosity & iliotibial tract | Inferior gluteal n. L5,S1,2 | - Extensor, abductor & lateral rotator of femur<br>- Act on IT tract |



## Gluteus medius & minimus:

| | Origin | Insertion | Innervation | Action |
|---|---|---|---|---|
| Medius | External surface of ilium between anterior and posterior gluteal lines | lateral surface of the greater trochanter | Superior gluteal n. L4,5,S1 | Abductor & medial rotator of the thigh ? |
| Minimus | External surface of ilium between inferior and anterior gluteal lines | anterior surface of the greater trochanter | | |





**Is thigh abduction so an important movement?**

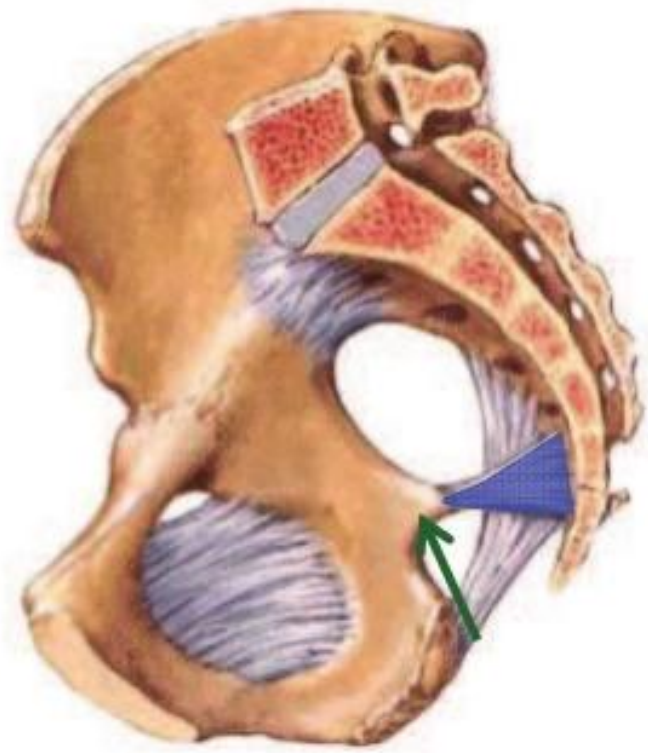
**-Glutei medius & minimus are important in holding both hips at the same level & preventing drop of the lifted side during walking**

**-Their paralysis causes +ve Trendelenburg sign (pelvis sags down when the limb is not weight bearing0**

| Muscle | Origin | Insertion | Innervation | Action |
|---|---|---|---|---|
| Piriformis | Anterior surface of middle 3 pieces of sacrum | Medial side of G trochanter | S1,2 | Lateral rotator & extensor of hip |
| Obturator internus | Deep surface of obturator membrane | | Nerve to OI (L5,S1) | Laterally rotate the extended femur & abduct the flexed femur |
| Gemellus superior | Ischial spine | OI tendon | | |
| Gemellus inferior | Ischial tuberosity | | Nerve to QF (L5,S1) | |
| Quadratus femoris | Lateral surface of iscjium | Intertrochanteric crest | | Lateral rotation of femur |

**Sacrotuberous & sacrospinous ligaments convert the sciatic notches of the hip to foramina:**

- **GSF leads to the pelvis**
- **LSF leads to the perineum**

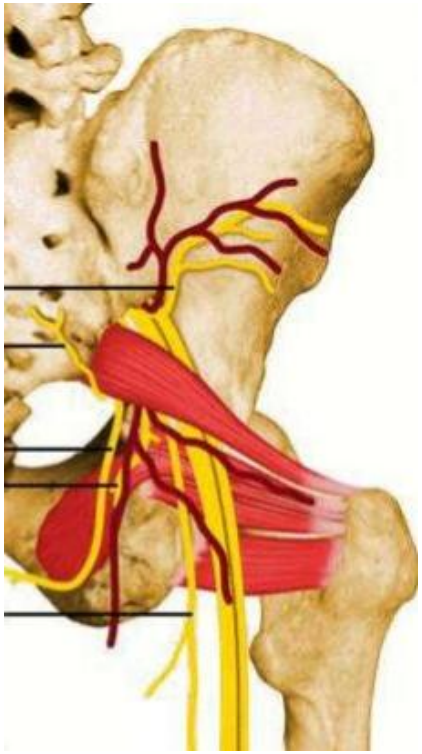


# Other structures in the G region

## Structures passing through greater sciatic foramen

### Above piriformis

1- Superior G artery
2- Superior G nerve



### Below piriformis

1- Inferior G artery
2- Inferior G nerve
3- Post. femoral cutaneous n.
4- Sciatic nerve
5- Nerve to QF
6- Nerve to OI
7- Pudendal n.
8- Internal pudendal vessels

## Structures passing through lesser sciatic foramen

1- Pudendal n.
2- Int. pudendal vs.
3- Nerve to OI

## Superior gluteal artery:

-From the posterior division of the internal iliac a.

-In the G region it gives superficial & deep branches

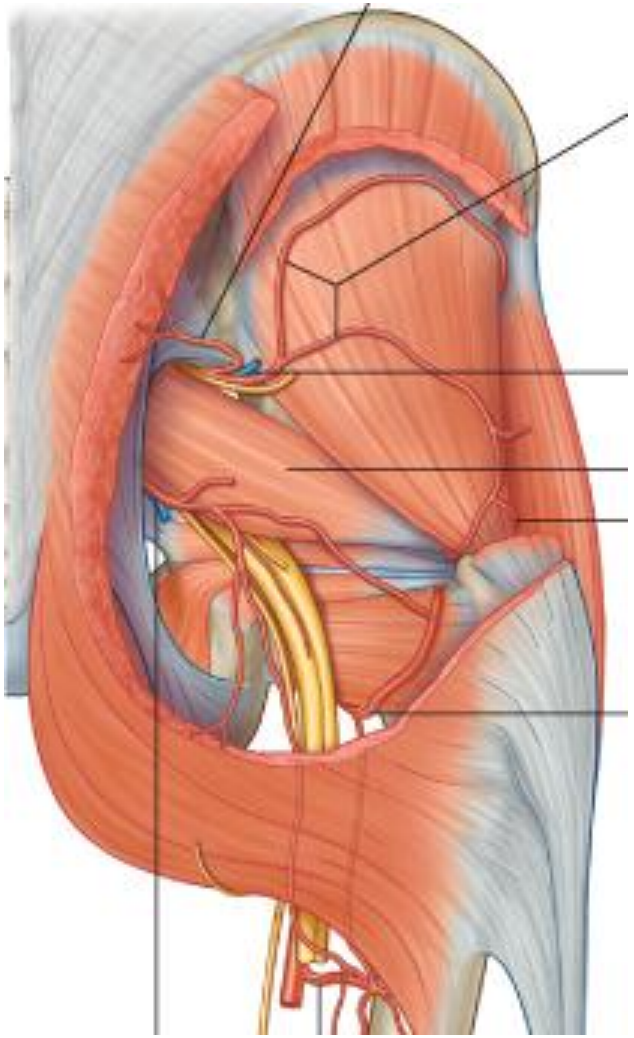
-Superficial; enters G. maximus

-Deep; passes between other 2 glutei supplying both with TFL & share in the anastomosis around ASIS

## Superior gluteal nerve:

-Arises from the posterior divisions of L4,5,S1

-Passes between the glutei medius & minimus supplying both with TFL



## Inferior gluteal artery:

-The largest of the 2 terminal divisions of the internal iliac a.

-In the G region it lies deep to G maximus

-Accompanies the sciatic n. & PCNT

## Inferior gluteal nerve:

-Arises from the posterior division of L5,S1,2

-Lies superficial to the sciatic nerve

-After a short course it divides into many branches which enter the deep surface of G maximus supplying it

## Posterior cutaneous nerve of the thigh:

-Arises from posterior divisions of S2,3

-Lies behind the sciatic nerve

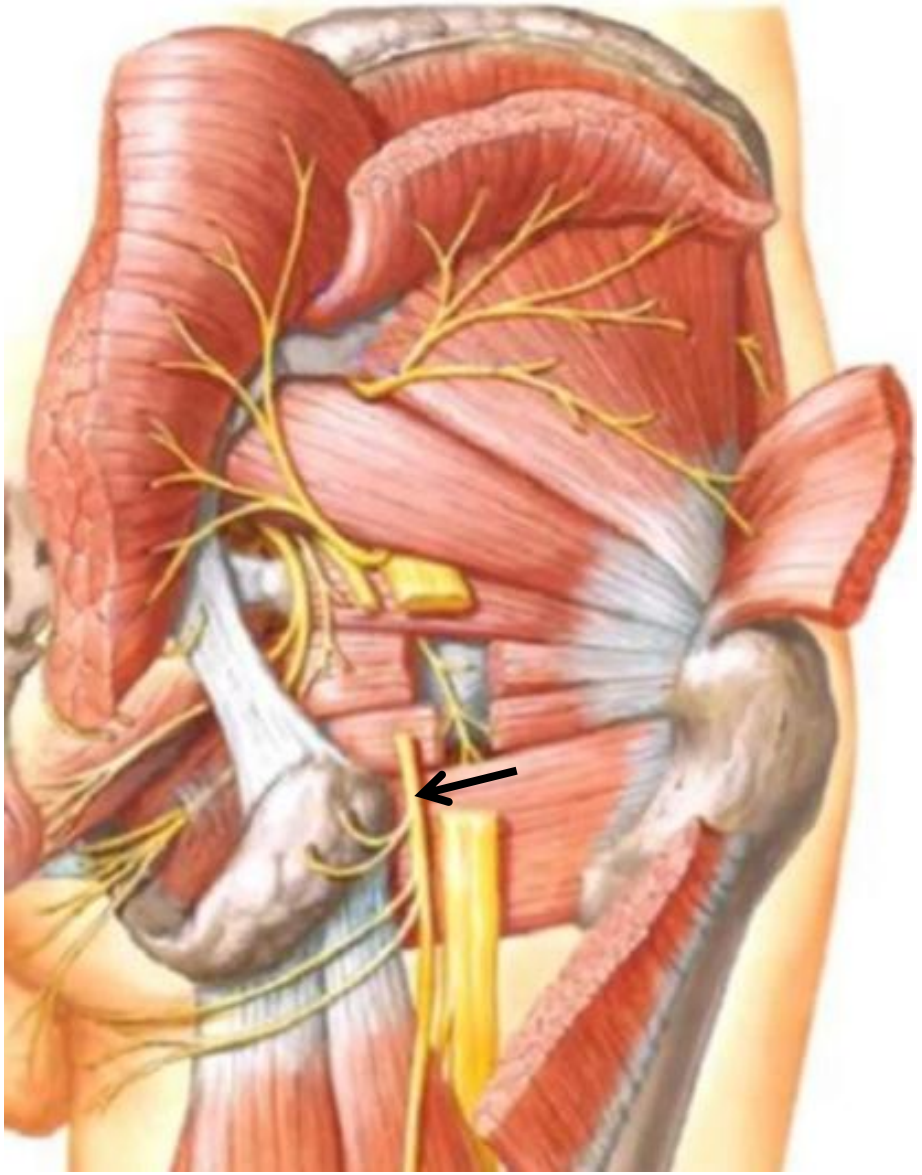
-Ends in the roof of the popliteal fossa

## Branches;

1- Gluteal to the inferomedial quadrant of G skin

2- Perineal to the skin of perineum

3- Perforating to the skin of the back of the thigh



## Sciatic nerve:

-The largest nerve in the body

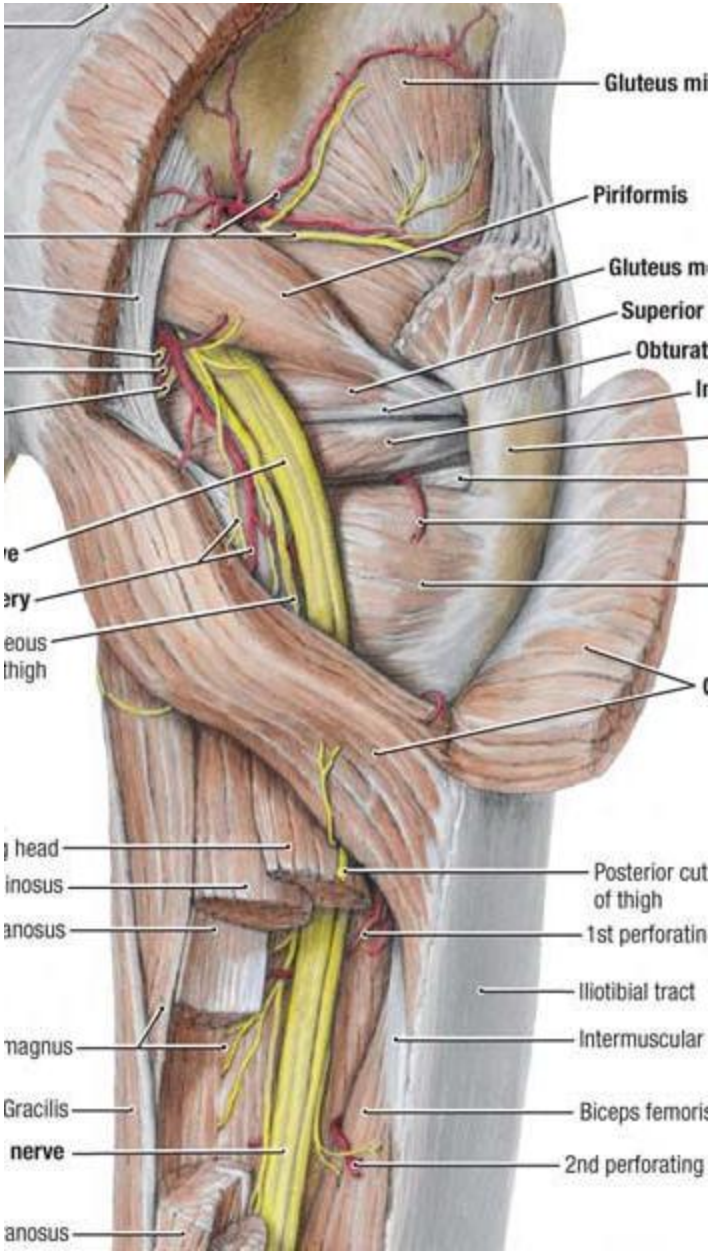
-Lies midway between the ischial tuberosity & greater trochanter

-Enters between the hanstring muscles where it divides into its 2 original components at the upper border of the popliteal fossa

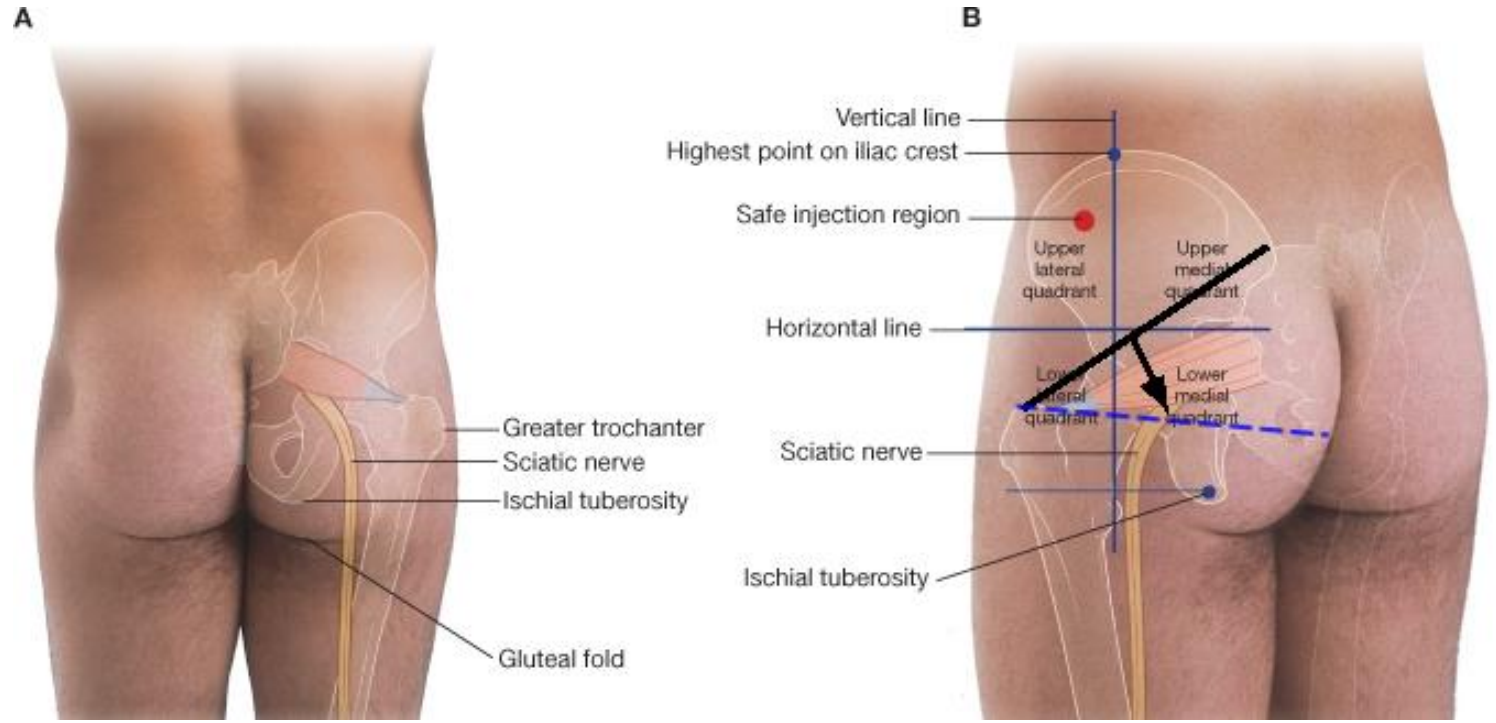
-Components:

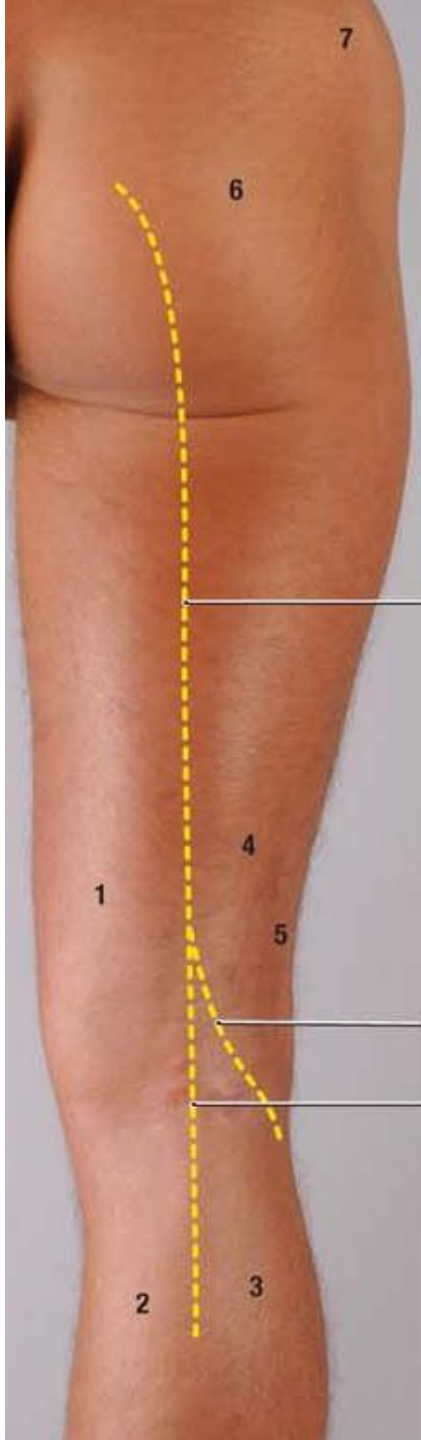
1- Tibial part (L4,5,S1,2,3 anterior)

2- Common peroneal part (L4,5,S1,2 posterior)



# Surface markings of the sciatic nerve & the safe site for i.m injection



## Nerve to obturator internus:

-Arises from anterior divisions of L5,S1

-Lies lateral to the pudendal vessels

-Crosses the ischial spine to enter the perineum through LSF

-Supplies OI & G superior

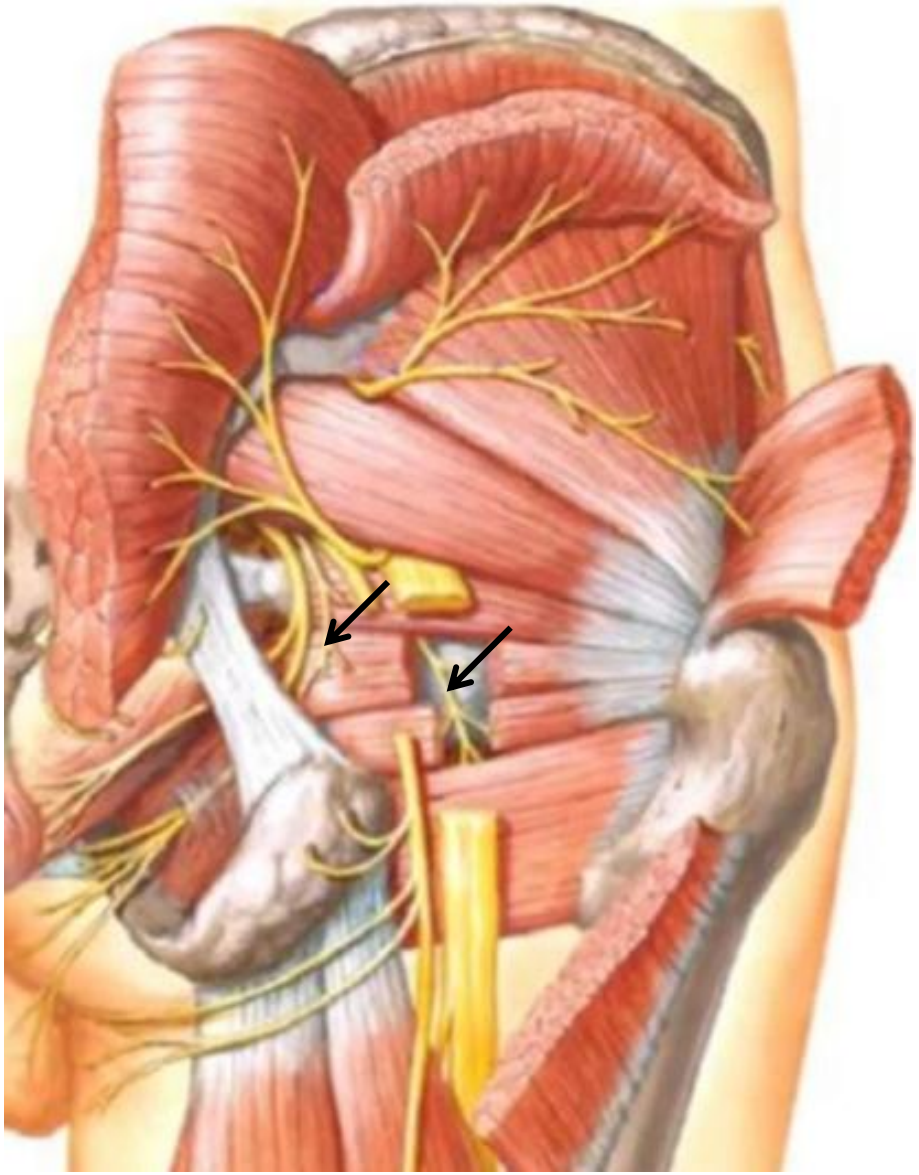
## Nerve to quadratus femoris:

-Arises from anterior divisions of L5,S1

-Descends anterior to OI & gemelli

-Enters QF at its anterior surface

-Supplies QF & G inferior

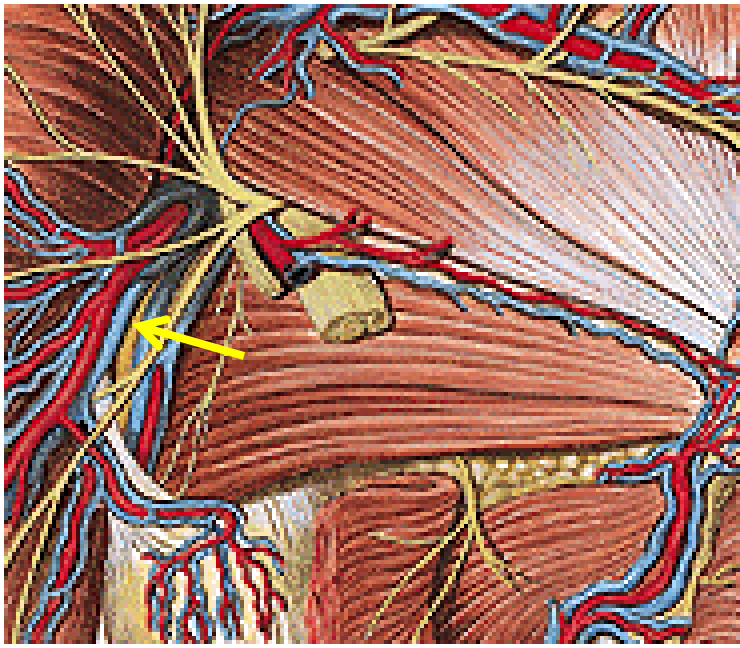


## Internal pudendal artery:

-From the anterior division of internal iliac artery

-Crosses the tip of the ischial spine (between the pudendal n. & n. to OI)

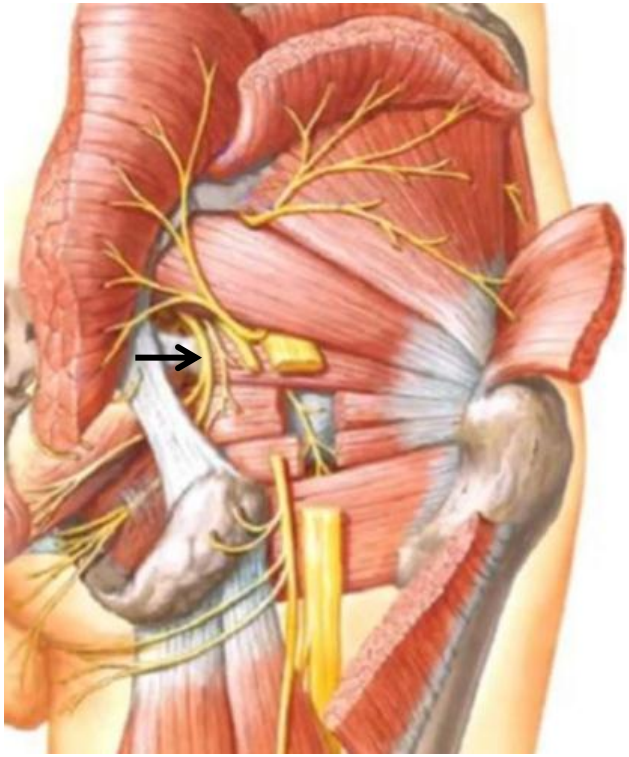
-Enters the perineum where it is distributed



## Pudendal nerve:

-Arises from anterior divisions of (S2,3,4)

-Crosses the sacrospinous ligament to enter the perineum where it is distributed



## Anastomosis around the ASIS:

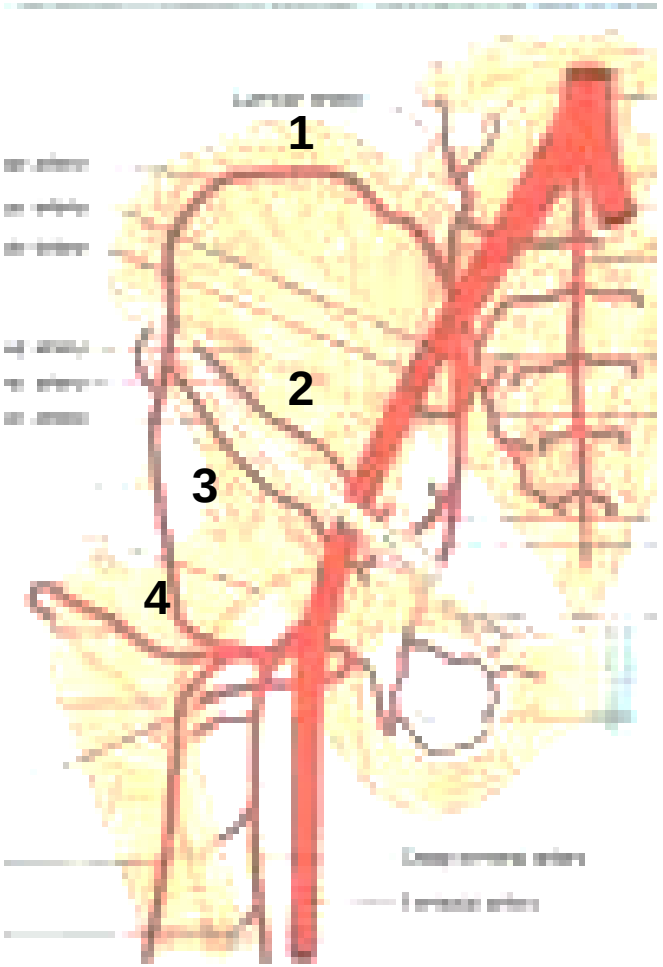
**Connect the iliac arteries to the femoral & profunda arteries**

**1- Iliac branch of iliolumbar artery (internal internal iliac)**

**2- Deep circumflex iliac a. (external iliac)**

**3- Superficial circumflex iliac a. (femoral)**

**4- Ascending branch of LCF (profunda femoris)**



## Trochanteric anastomosis:

-Lie in the trochanteric fossa

-Supplies the femoral head

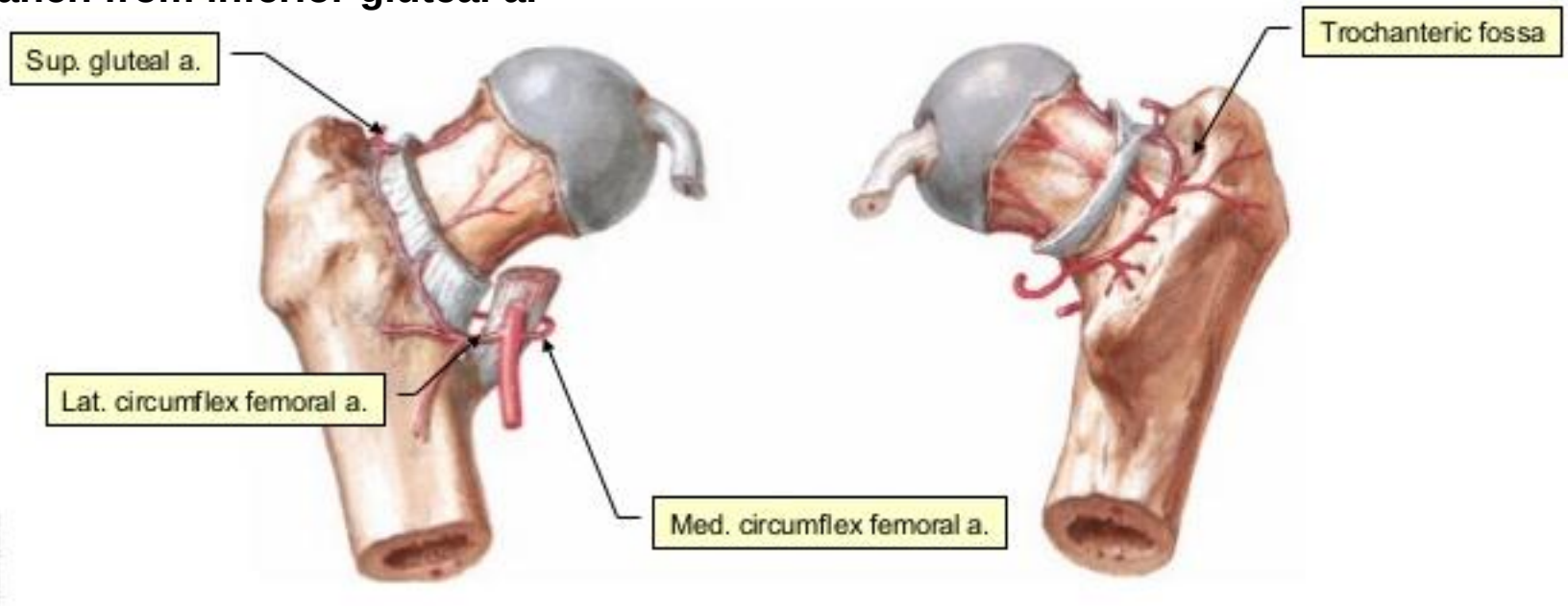
-Formed by:

1- Ascending branch of LCF

2- Ascending branch of MCF

3- Branch from superior gluteal a.

4- Branch from inferior gluteal a.



## Cruciate anastomosis:

-**Connects the internal iliac a. to the profunda femoris**

-**Lies in the region of QF**

-**Formed by:**

**1- Transverse branch of LCF**

**2- Transverse branch of MCF**

**3- Ascending branch of 1st perforating a.**

**4-Descending branch of inferior gluteal a. (internal iliac)**

**Profunda femoris**