

# Gluteal Region

## Note:

These is a preliminary consideration of the chapter for better & actual understanding of the topic kindly refer to the textbook for any missconcept teacher is not responsible.

**Gluteal Region:** It overlies the side and back of pelvis, extending from iliac crest to the gluteal fold. Its lower part shows a bulge known as buttock.

## **SUPERFICIAL FASCIA**

### **Cutaneous Nerves**

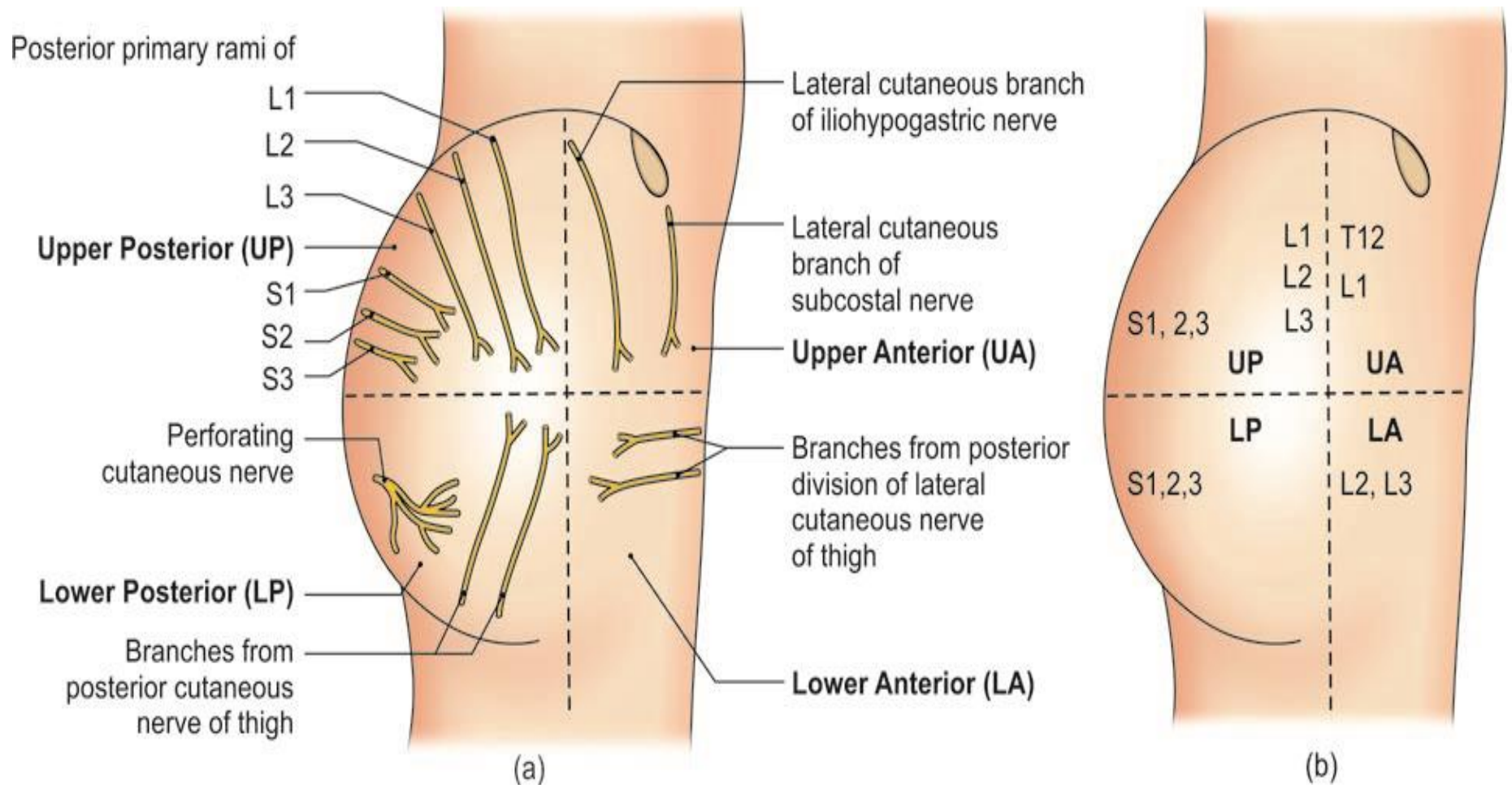
### **Muscles of Gluteal Region**

### **Features**

These muscles are:

1. The gluteus maximus
2. Gluteus medius
3. Gluteus minimus
4. Piriformis

5. Superior gemellus
6. Inferior gemellus
7. Obturator internus
8. Obturator externus
9. Quadratus femoris
10. The tensor fasciae latae which lies on the lateral side of thigh, just in front of gluteal region, is also considered here. The attachments and nerve supply and the actions of these muscles are given.



Cutaneous innervation of the gluteal region: (a) Cutaneous nerves, and (b) root values of the nerves in the four quadrants

**Table 5.1: Muscles of the gluteal region**

<i>Muscle</i>	<i>Origin</i>	<i>Insertion</i>
<b>Gluteus maximus</b> This is a large, quadrilateral powerful muscle covering mainly the posterior surface of pelvis. It comprises red muscle fibres	<ul style="list-style-type: none"> <li>• Outer slope of the dorsal segment of iliac crest</li> <li>• Posterior gluteal line</li> <li>• Posterior part of gluteal surface of ilium behind the posterior gluteal line</li> <li>• Aponeurosis of erector spinae</li> <li>• Dorsal surface of lower part of sacrum</li> <li>• Side of coccyx</li> <li>• Sacrotuberous ligament</li> <li>• Fascia covering gluteus medius</li> </ul>	<ul style="list-style-type: none"> <li>• The deep fibres of the lower part of the muscle are inserted into the gluteal tuberosity (1/4th part)</li> <li>• The greater part of the muscle is inserted into the iliotibial tract (3/4 th part)</li> </ul>
<b>Gluteus medius</b> It is fan-shaped, and covers the lateral surface of the pelvis and hip	Gluteal surface of ilium between the anterior and posterior gluteal lines	Into the greater trochanter of femur, on oblique ridge on the lateral surface. The ridge runs downwards and forwards

*Contd.*

**Gluteus minimus**

It is fan-shaped, and is covered by the gluteus medius

Gluteal surface of ilium between the anterior and inferior gluteal lines

Into greater trochanter of femur, on a ridge on its anterior surface

**Piriformis**

Lies below and parallel to the posterior border of the gluteus medius

It arises within the pelvis from:

- Pelvic surface of the middle three pieces of the sacrum, by three digitations
- Upper margin of the greater sciatic notch

The rounded tendon is inserted into the apex of the greater trochanter of the femur

**Gemellus superior**

Small muscle lying along the upper border of the tendon of the obturator internus

Upper part of lesser sciatic notch

Blends with tendon of obturator internus, and gets inserted into medial surface of greater trochanter of femur

**Gemellus inferior**

Small muscle lying along the lower border of the tendon of the obturator internus

Lower part of lesser sciatic notch

Same as above

*Contd.*

**Obturator internus**

Fan-shaped, flattened belly lies in pelvis and the tendon in the gluteal region

- Pelvic surface of obturator membrane
- Pelvic surface of the body of the ischium, ischial tuberosity, ischiopubic rami, and ilium below the pelvic brim
- Obturator fascia

The tendon of the obturator internus leaves the pelvis through the lesser sciatic foramen. Here it bends at a right angle around the lesser sciatic notch and runs laterally to be inserted into the medial surface of the greater trochanter of the femur

**Quadratus femoris**

Quadrilateral muscle lying between inferior gemellus and adductor magnus

Upper part of the outer border of ischial tuberosity

Quadratus tubercle and the area below it

**Obturator externus**

Triangular in shape, covers the outer surface of the anterior wall of the pelvis

- Outer surface of obturator membrane
- Outer surface of the bony margins of obturator foramen

The muscle ends in a tendon which runs upwards and laterally behind the neck of the femur to reach the gluteal region where it is inserted into the trochanteric fossa (on medial side of the greater trochanter)

**Tensor fasciae latae**

Lies between the gluteal region and the front of the thigh

Anterior 5 cm of the outer lip of the iliac crest up to the tubercle of iliac crest

Iliotibial tract 3–5 cm below the level of greater trochanter



**Table 5.2: Nerve supply and actions of muscles**

<i>Muscle</i>	<i>Nerve supply</i>	<i>Actions</i>
<b>Gluteus maximus</b>	Inferior gluteal nerve (L5, S1, S2)	<p>Chief extensor of the thigh at the hip joint. This action is very important in rising from a sitting position. It is essential for maintaining the erect posture. Other actions are:</p> <ul style="list-style-type: none"><li>a. Lateral rotation of the thigh</li><li>b. Abduction of the thigh (by upper fibres)</li><li>c. Along with the tensor fasciae latae the muscle stabilises the knee through the iliotibial tract</li></ul> <p>It supports both the hip and the knee when these joints are slightly flexed. It is an antigravity muscle as well.</p>

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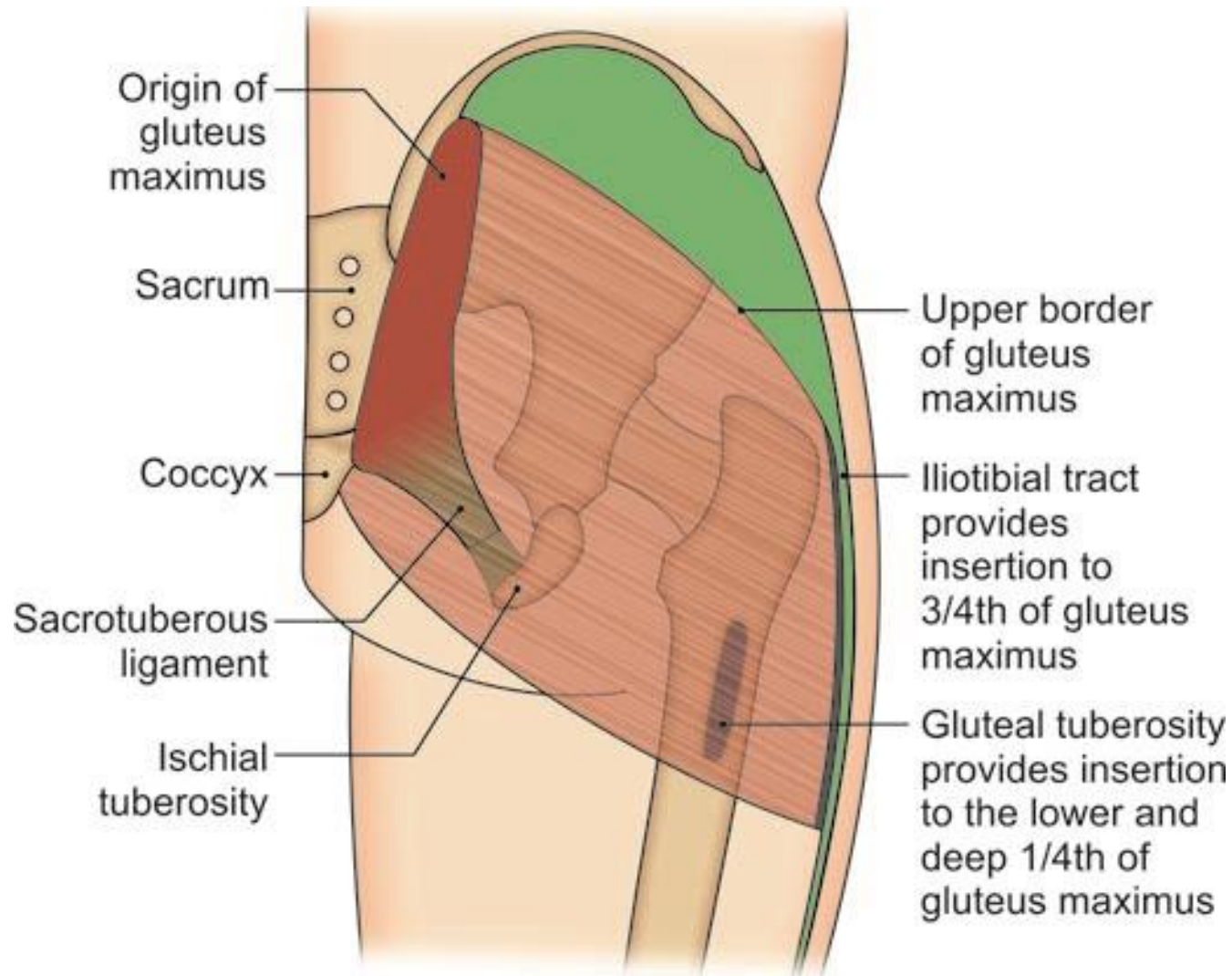
<b>Gluteus medius</b>	Superior gluteal nerve (L4, L5, S1)
<b>Gluteus minimus</b>	Superior gluteal nerve (L4, L5, S1)

The *gluteus medius* and *gluteus minimus* are:  
Powerful abductors of the thigh. Their anterior fibres are also medial rotators. However, their most important action is to maintain the balance of the body when the opposite foot is off the ground, as in walking and running. They do this by preventing the opposite side of the pelvis from tilting downwards under the influence of gravity.

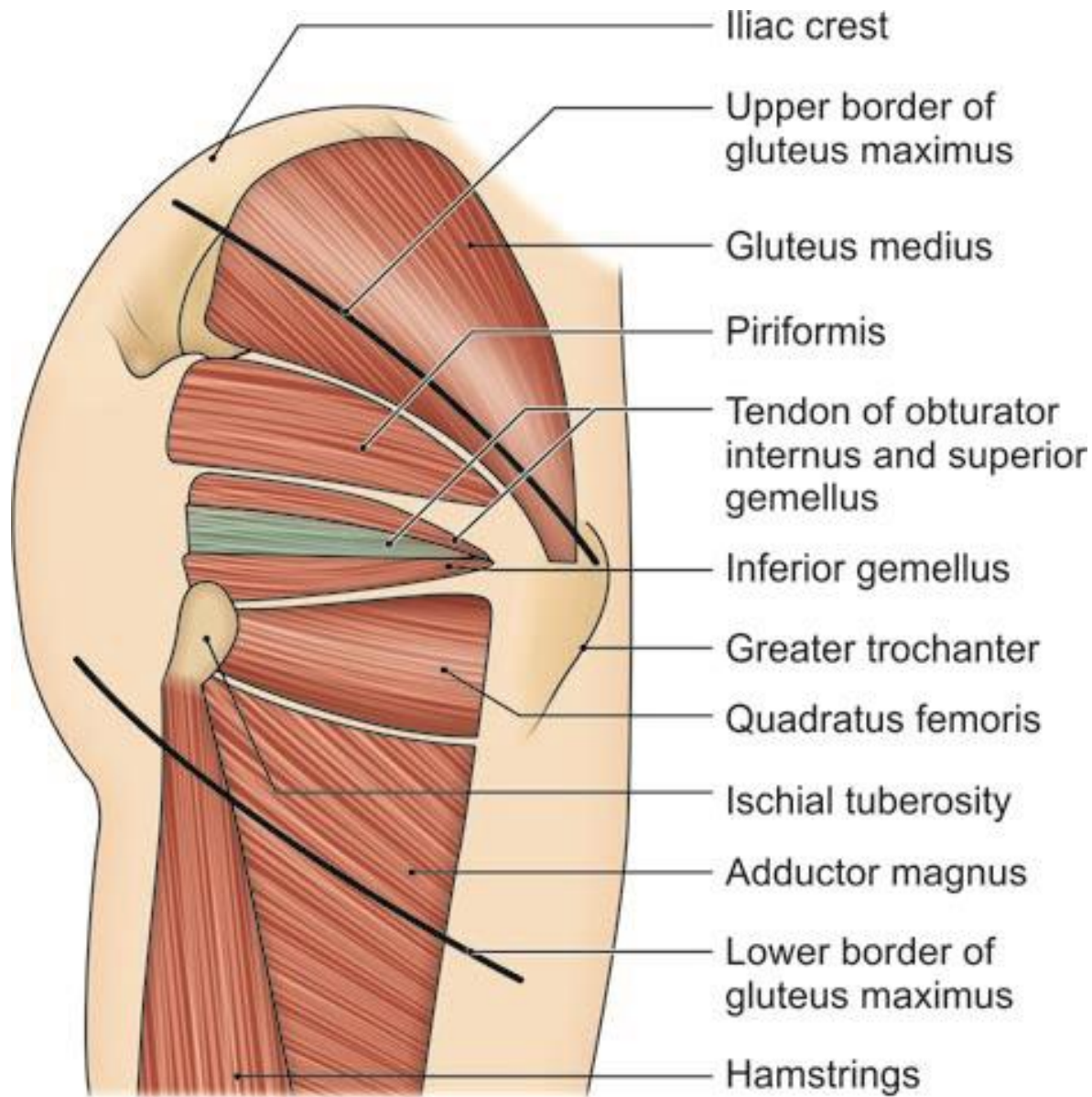
<b>Piriformis</b>	Ventral rami of S1, S2
<b>Gemellus superior</b>	Nerve to obturator internus (L5, S1, S2)
<b>Gemellus inferior</b>	Nerve to quadratus femoris (L4, L5, S1)
<b>Obturator internus</b>	Nerve to obturator internus (L5, S1, S2)
<b>Quadratus femoris</b>	Nerve to quadratus femoris (L4, L5, S1)
<b>Obturator externus</b>	Posterior division of obturator nerve (L2, L3, L4)
<b>Tensor fasciae latae</b>	Superior gluteal nerve (L4, L5, S1)

Lateral rotators of thigh at the hip joint

Abductor and medial rotator of thigh and an extensor of knee joint



Origin and insertion of the gluteus maximus muscle



Muscles under cover of the gluteus maximus

# Structures Under Cover of Gluteus Maximus

These are numerous as follows.

## Muscles

1. Gluteus medius
2. Gluteus minimus.
3. Reflected head of the rectus femoris.
4. Piriformis.
5. Obturator internus with two gemelli.
6. Quadratus femoris.
7. Obturator externus.
8. Origin of the four hamstrings from the ischial tuberosity.
9. Insertion of the upper or pubic fibres of the adductor magnus.

## Vessels

1. Superior gluteal vessels.
2. Inferior gluteal vessels.
3. Internal pudendal vessels.
4. Ascending branch of the medial circumflex femoral artery.
5. Trochanteric anastomoses
6. Cruciate anastomoses.
7. The first perforating artery.

## Nerves

1. Superior gluteal (L4, L5, S1).
2. Inferior gluteal (L5, S1, S2).
3. Sciatic (L4, L5, S1, S2, S3)

4. Posterior cutaneous nerve of thigh (S1, S2, S3).
5. Nerve to the quadratus femoris (L4, L5, S1).
6. Pudendal nerve (S2, S3, S4).
7. Nerve to the obturator internus (L5, S1, S2).
8. Perforating cutaneous nerves (S2, S3).

### ***Bones and Joints***

1. Ilium.
2. Ischium with ischial tuberosity.
3. Upper end of femur with the greater trochanter.
4. Sacrum and coccyx.
5. Hip joint.
6. Sacroiliac joint

## ***Ligaments***

1. Sacrotuberous
2. Sacrospinous
3. Ischiofemoral

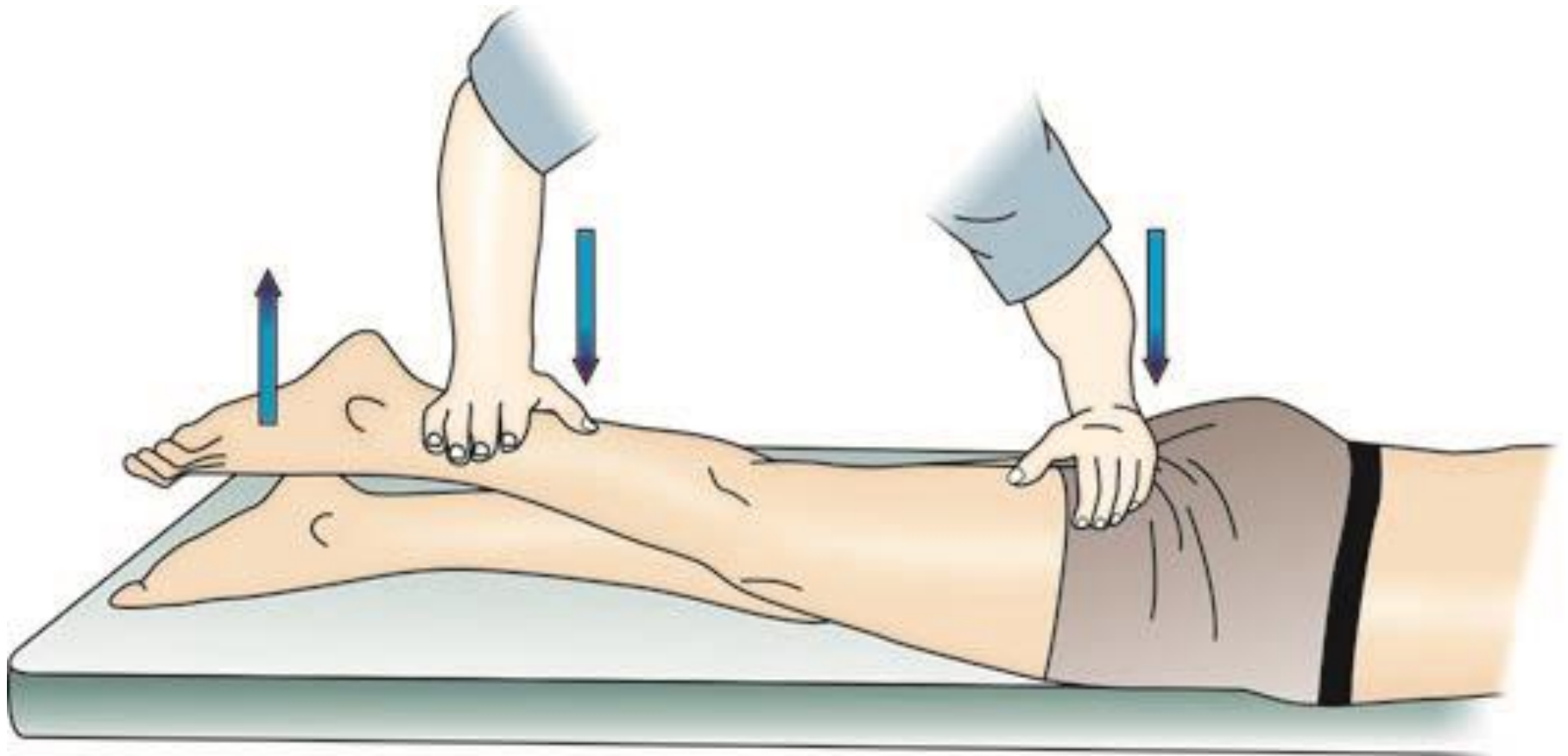
## ***Bursae***

1. Trochanteric bursa of gluteus maximus
2. Bursa over the ischial tuberosity
3. Bursa between the gluteus maximus and vastus lateralis

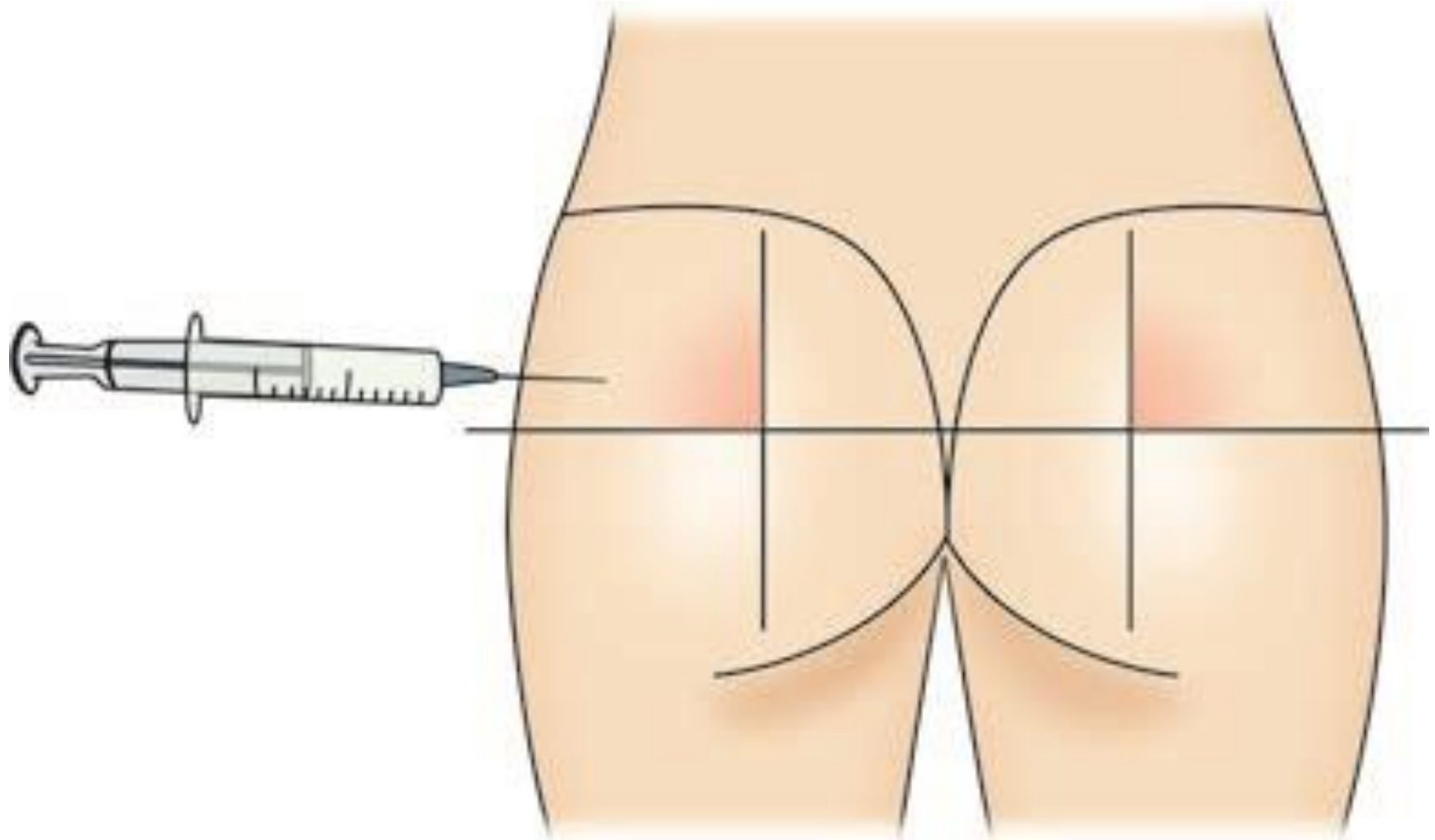


## CLINICAL ANATOMY

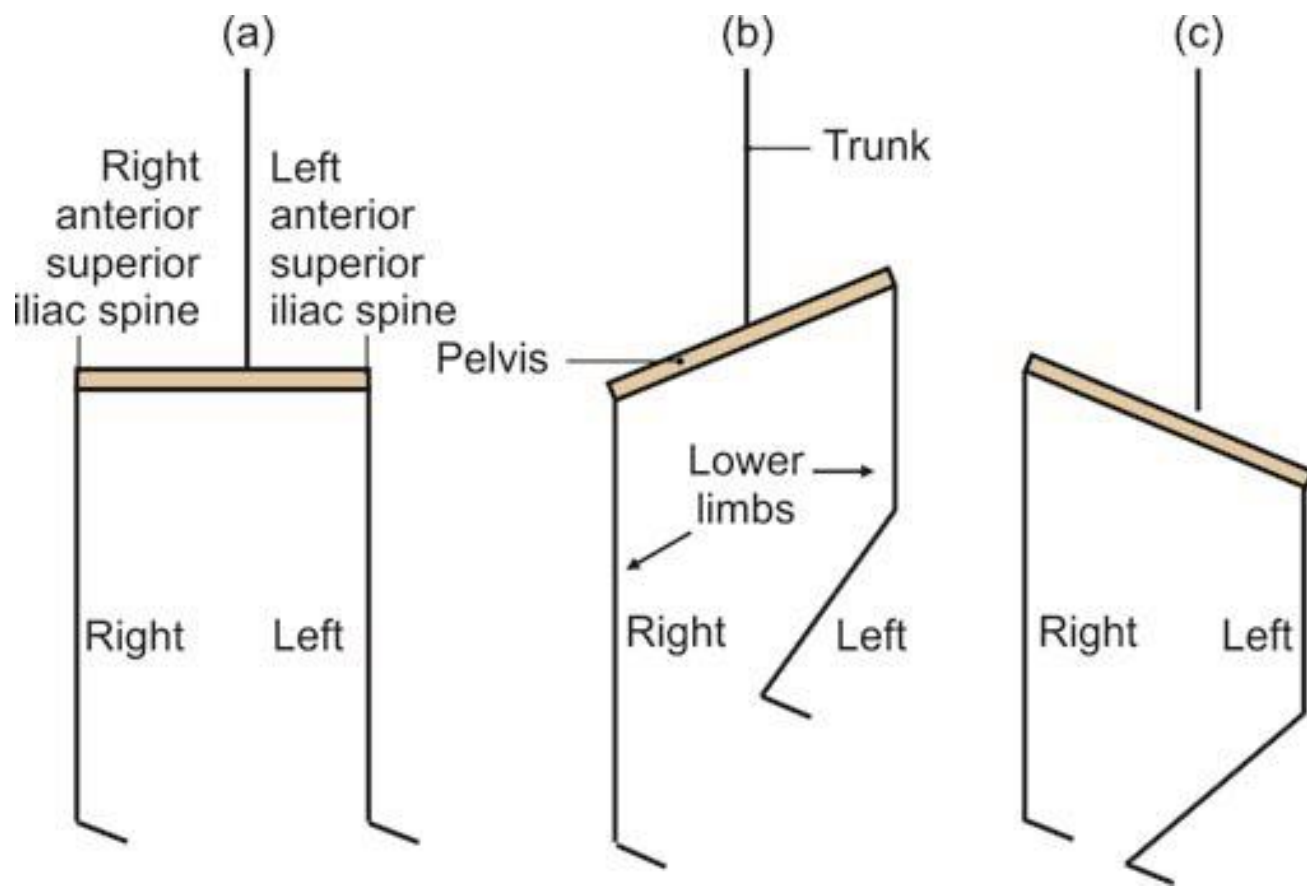
- Testing gluteus maximus.
- Intramuscular injections.
- When the glutei medius and minimus (of right side) are paralysed, the patient cannot walk normally. He bends or waddles on the right side or paralysed side to clear the opposite foot, i.e. left foot off the ground. This is known as lurching gait; when bilateral, it is called waddling gait.
- *Trendelenburg's sign*



How to test the gluteus maximus



Site of intramuscular injection



Trendelenburg's sign. (a) When both feet are supporting the body weight, the pelvis (anterior superior iliac spine) on the two sides lies in the same horizontal plane, (b) when only the right foot is supporting the body weight, the unsupported side of the pelvis is normally raised by the opposite gluteal medius and minimus, and (c) if the right glutei medius and minimus are paralysed, the unsupported left side of the pelvis drops. This is a positive

## **NERVES OF THE GLUTEAL NERVE**

### **Superior Gluteal Nerve (L4, L5, S1)**

*Root value:* L4, L5, S1.

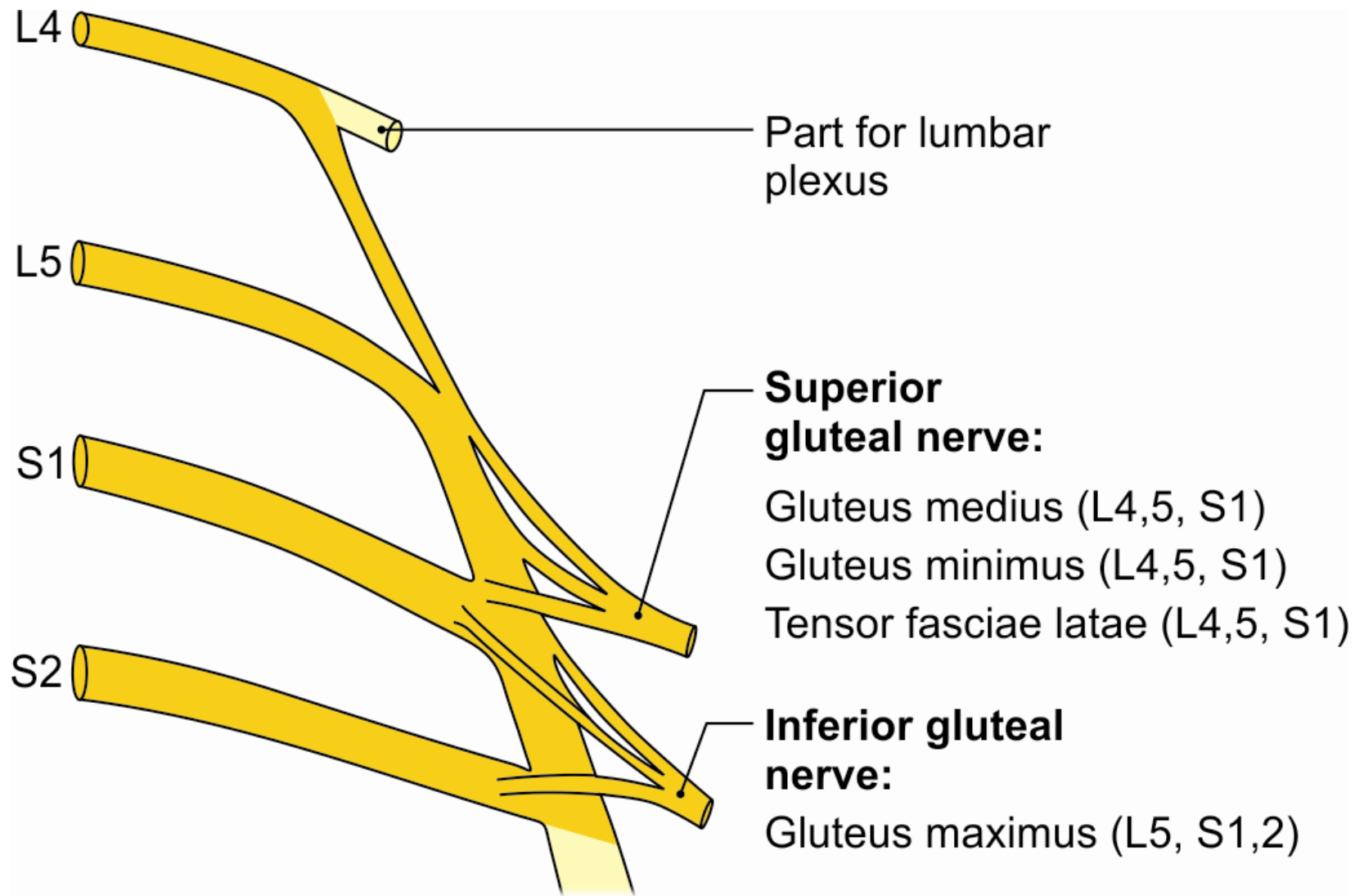
*Course:* Enters the gluteal region through greater sciatic notch above piriformis muscle. Runs between gluteus medius and gluteus minimus to end in tensor fasciae latae.

*Branches:* It supplies gluteus medius, gluteus minimus and tensor fasciae latae.

### **Inferior gluteal nerve**

*Root value:* L5, S1, S2.

*Course:* Enters the gluteal region through greater sciatic notch below piriformis muscle.



Muscles supplied by superior gluteal nerve and inferior gluteal nerve

*Branches:* It gives a number of branches to the gluteus maximus muscle only. It is the sole supply to the large antigravity, postural muscle with red fibres, responsible for extending the hip joint.

## **SCIATIC NERVE (L4, L5, S1, S2, S3)**

### **Nerve to Quadratus Femoris (L4, L5, S1)**

*Root value:* L4, L5, S1

*Branches:* It supplies quadratus femoris, inferior gemellus and hip joint.

### **Nerve to the Obturator Internus (L5, S1, S2)**

*Root value:* L5, S1, S2

*Branches:* It supplies obturator internus and superior gemellus.

## **PUDENDAL NERVE (S2, S3, S4)**

This is branch of the sacral plexus. It enters the gluteal through greater sciatic foramen, crosses the sacrospinous ligament to enter the lesser sciatic foramen.

## **ARTERIES OF GLUTEAL REGION**

**Superior Gluteal Artery:** A branch of posterior division of internal iliac artery.

In greater sciatic foramen, it divides into superficial and deep branches which supply neighbouring muscles.

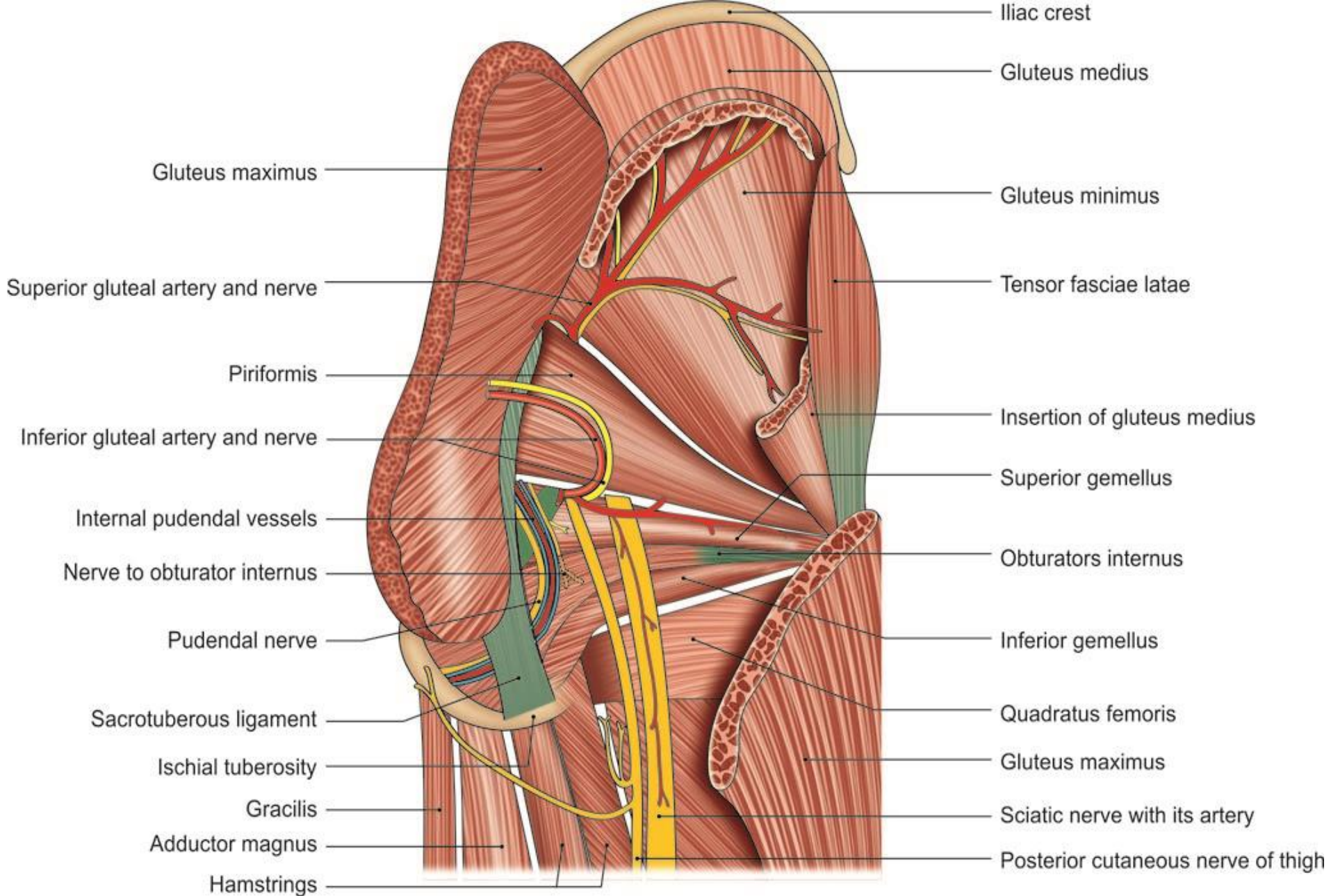


## **Inferior Gluteal Artery**

It is a branch of the anterior division of the internal iliac artery.

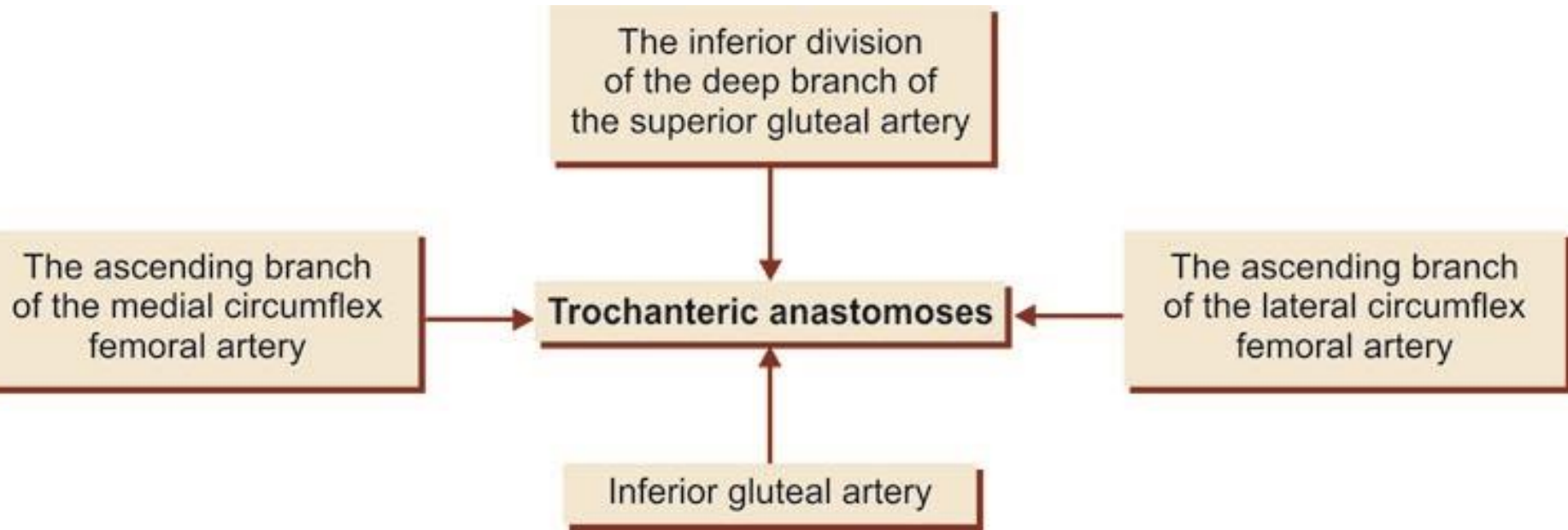
It enters the gluteal region by passing through the greater sciatic foramen, below the piriformis,

1. Muscular branches
2. Cutaneous branches
3. An articular branch
4. Trochanteric and cruciate anastomotic branches.
5. An artery to the sciatic nerve, which represents the axial artery in this region,

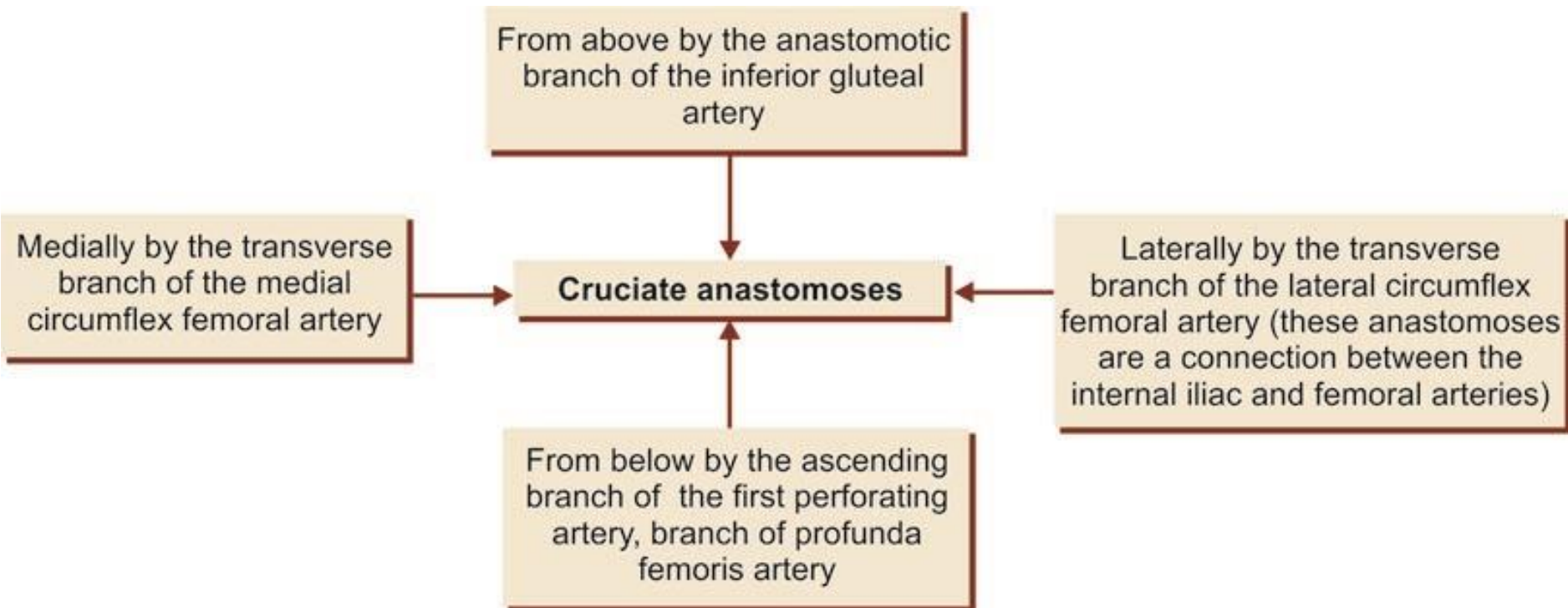


Structures in the gluteal region

## Flowchart 5.1: Trochanteric anastomoses



## Flowchart 5.2: Cruciate anastomoses



# **Trochanteric Anastomoses**

## **Cruciate Anastomoses**

### **Structures Passing through the Greater Sciatic Foramen (gateway of gluteal region)**

1. The piriformis, emerging from the pelvis fills the foramen almost completely. It is the key muscle of the region.
2. Structures passing above the piriformis are:
  - a. Superior gluteal nerve.
  - b. Superior gluteal vessels.
3. Structures passing below the piriformis are:
  - a. Inferior gluteal nerve.
  - b. Inferior gluteal vessels.
  - c. Sciatic nerve.

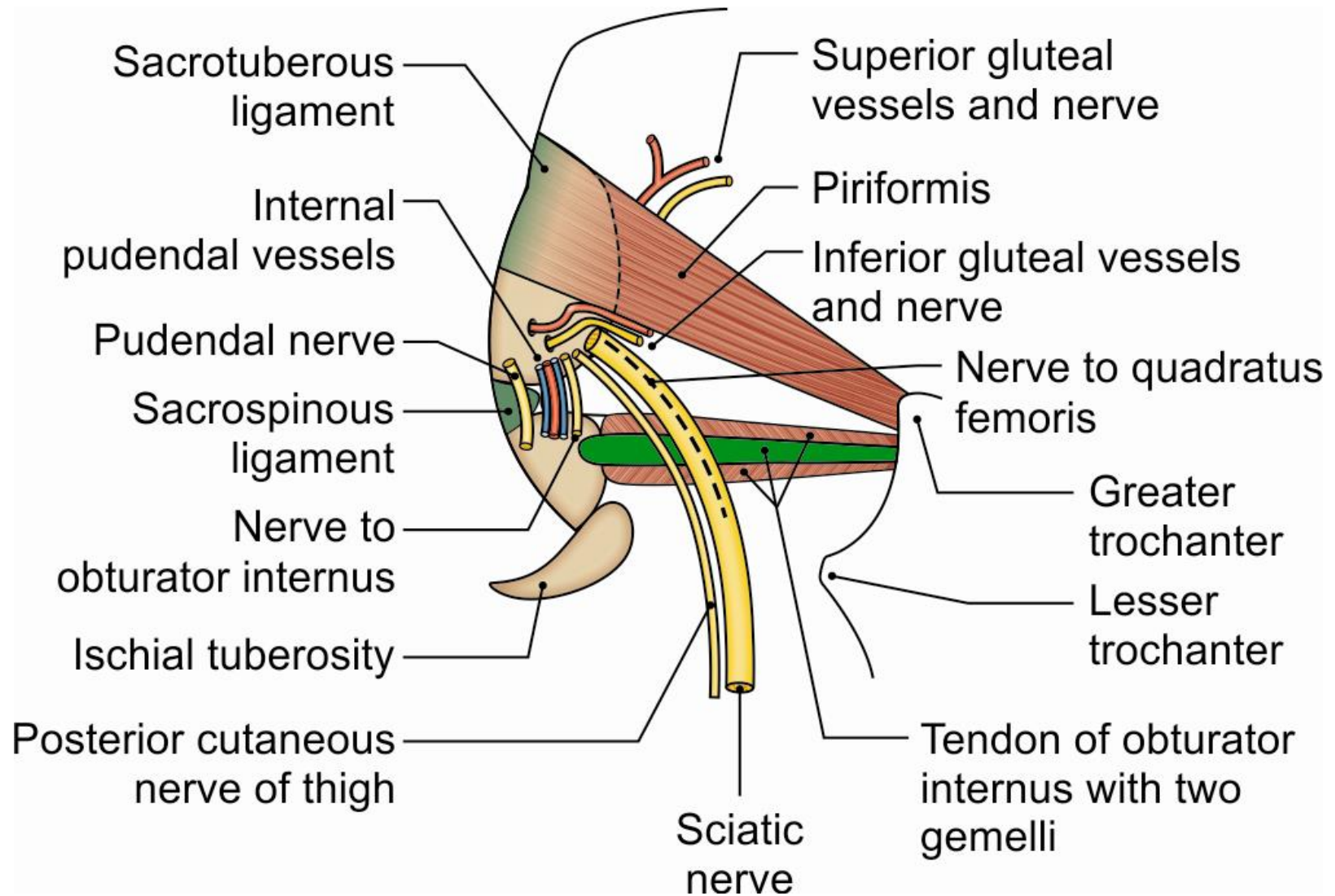
- d. Posterior cutaneous nerve of thigh.
- e. Nerve to quadratus femoris.
- f. Nerve to obturator internus.
- g. Internal pudendal vessels.
- h. Pudendal nerve.

The last three structures, after a short course in the gluteal region, enter the lesser sciatic foramen, where the pudendal nerve and internal pudendal vessels run in the pudendal canal.

# Structures Passing through the Lesser Sciatic Foramen

1. Tendon of obturator internus.
2. Pudendal nerve.
3. Internal pudendal vessels.
4. Nerve to obturator internus.





Structures passing through greater and lesser sciatic notches



## FACTS TO REMEMBER

- Gluteus maximus is the antigravity, postural thickest muscle of the body. It contains red fibres.
- Sciatic nerve is the thickest nerve of the body.
- Intramuscular injections are given in the upper and lateral quadrant of the gluteal region into gluteus medius.
- Greater sciatic notch is the gateway of the gluteal region
- Sciatic nerve and pudendal nerve do not supply any structure in the gluteal region.
- Piriformis is the key muscle of the gluteal region.
- Sciatic nerve and its branches supply the hamstring muscles muscles of all the three

- Sciatic nerve is accompanied by a thin artery, the sciatic artery, which is part of the axial artery of the lower limb.
- Lesser sciatic foramen is the gateway of the perineal region.
- Sciatic nerve lies on the femur for a very short distance between lower border of quadratus femoris and upper border of adductor magnus muscles. At this site it may get compressed when one sits on a stool or a bench; leading to harmless condition, the sleeping foot.