



## Sacral Plexus

(Anatomy System, 2026, Science Insights, 2026; Soldatos *et al.*, 2013; Davies, 2026; Miniato, Black and Varacallo, 2023; Anatomy.co.uk, 2025a; 2025b and 2025c)

| Name of plexus | Position                                                                                                              | Location                                                        | Nerves present                           | Roots    | Innervation of the nerve                                                                                                                                                                                                                           | Sensation of the nerve                                                                                                                                                                      | Muscles                                                                                                                                                                                                                                                                                                                                   |
|----------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sacral Plexus  | Lumbosacral trunk<br>(Lower lumbar roots L4 and L5)<br><br>Sacral roots (S1 to S3)<br><br>Minor contribution from S3. | Gluteus muscles (on buttocks)<br><br>back of thigh (hamstrings) | Sciatic nerve (largest peripheral nerve) | L4 to S3 | Back of thigh<br>Just above knee.<br>Below piriformis muscle<br><br>Exits the pelvis through the greater sciatic foramen (please see images) and then divides into:<br><br>Two terminal branches:<br>Tibial nerve<br><br>Common fibular (peroneal) | Tibial nerve: skin of posterior leg and sole of foot (calcaneus).<br><br>Common fibular (peroneal): the skin of the anterior and lateral leg and dorsum of the foot (upper surface of foot) | All muscles in lower leg and foot.<br><br><b>TIBIAL NERVE/MUSCLE ACTION</b><br>Tibial nerve does the posterior thigh muscles, leg and foot soles<br><br>Posterior thigh muscles (hamstrings) consist of three muscles:<br>biceps femoris<br>semitendinosus<br>semimembranosus<br>They extend the thigh, flex the leg and rotate the knee. |



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| Name of plexus | Position           | Location                                               | Sciatic nerve (continued) | Root     | Innervation of the nerve                          | Sensation of the nerve continued                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|--------------------|--------------------------------------------------------|---------------------------|----------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sacral         | L4 to S3 continued | Gluteus muscles (on buttocks)<br><br>And back of thigh |                           | L4 to S3 | Tibialis nerve and the peroneal nerve (continued) | Tibial nerve: skin of posterior leg and sole of foot (calcaneus).<br><br>Common fibular (peroneal): the skin of the anterior and lateral leg and dorsum of the foot (upper surface of foot). | Posterior leg and foot sole flex the knee, toes, plantarflex the ankle. They consist of superficial and deep muscles.<br><b>Superficial</b><br><b>Posterior leg: gastrocnemius, soleus</b><br><b>Foot sole: plantaris</b><br><b>Deep:</b><br><b>Posterior leg: tibialis posterior, flexor hallucis longus, flexor digitorum longus</b><br><b>ischial aspect of the adductor magnus of hamstring part.</b><br><b>Their role is to extend the thigh.</b> |



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| Name of plexus | Position           | Location                                               | Sciatic nerve (continued) | Root     | Innervation of the nerve                          | Peroneal nerve |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|--------------------|--------------------------------------------------------|---------------------------|----------|---------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | L4 to S3 continued | Gluteus muscles (on buttocks)<br><br>And back of thigh |                           | L4 to S3 | Tibialis nerve and the peroneal nerve (continued) |                | <b>Peroneal nerve</b><br><b>It does the short head of biceps femoris.</b><br><b>Anterior leg muscles:</b> tibialis anterior, extensor hallucis longus, extensor digitorum longus, peroneus fibularis tertius.<br>Their role is involved in dorsiflexion, toe extension, foot inversion, slight foot eversion<br><br><b>lateral leg muscles:</b> peroneus longus and peroneus brevis. They evert the foot and assist in ankle plantar flexion |
|                |                    |                                                        |                           |          |                                                   |                |                                                                                                                                                                                                                                                                                                                                                                                                                                              |



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| Name of plexus | Position           | Location                                               | Nerves present                         | Roots    | Innervation of the nerve                                                                                                                                                                                       | Sensation of the nerve | Muscles                                                                                                                                                                                                                                                                                                             |
|----------------|--------------------|--------------------------------------------------------|----------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sacral         | L4 to S3 continued | Gluteus muscles (on buttocks)<br><br>And back of thigh | Gluteus nerves: Superior gluteal nerve | L4 to S1 | Abductor of hips.<br><br>(Abductors are movement away from the midline)<br><br>It exits the pelvis through sciatic foramen above the piriformis muscle along the superior gluteal artery and vein (see images) | None                   | Gluteus medius and minimus (Muscles that move hips outward and keeps pelvis leveled when standing on one foot)<br><br>Tensor fasciae latae muscles: A small, fusiform muscle located on the lateral side of the thigh. Flexes, medially rotates, and abducts the hip while externally rotating the leg at the knee. |
|                |                    |                                                        | Gluteus nerves: Inferior gluteal nerve | L5 to S2 | Extensor of the hips<br><br>It exits the pelvis via the greater sciatic foramen beneath the piriform muscle.                                                                                                   | None                   | Gluteus maximas (Muscle behind hip extension and standing from seated position and climbing stairs). Other muscles support this such as femoral nerve and quadriceps femoris.                                                                                                                                       |



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| Name of Plexus | Position                                                                                                                          | Location                                               | Nerve present                     | Roots    | Innervation of the nerve                      | Sensation of the nerve                   | Muscles           |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------|----------|-----------------------------------------------|------------------------------------------|-------------------|
| Sacral Plexus  | L4 to S3<br><br>Lumbosacral trunk<br>(Lower lumbar roots L4 and L5)<br><br>Sacral roots (S1 to S3)<br>Minor contribution from S3. | Gluteus muscles (on buttocks)<br><br>And back of thigh | Posterior femoral cutaneous nerve | S1 to S3 | Skin of perineum<br>Back of the thigh and leg | Sensory input to gluteal and lower limbs | No motor control. |



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| Name of plexus | Position | Location                                | Nerve    | Root     | Innervation of the nerve                                                                                                                          | Sensation of the nerve                                                                     | Muscles                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|----------|-----------------------------------------|----------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sacral         | L4 TO S3 | Back of legs (thigh)<br>And<br>Buttocks | Pudendal | S2 to S4 | Sphincters (little doors) muscles of the bladder (stores urine/pee/wee)<br><br>Sphincters of the muscles of the rectum (stores poo/faeces/stools) | External genital in both genders penis for men and clitoris for women and most of perineum | Muscles of perineum.<br><br>Urethra muscles<br>Anus muscles<br>Urogenital diaphragm<br><br>Bulbospongiosus and ischiocavernosus muscles<br><br>The bulbospongiosus is a paired muscle in the urogenital triangle of the pelvic floor . It supports the urinary and reproductive system in both males and females. It is a paired muscle found either side of the midline. |



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| Name of plexus | Position | Location                           | Nerve              | Root     | Innervation of the nerve                                                                                                                                 | Sensation of the nerve                                                                      | Muscles continued                                                                                                                                                                                                                                                           |
|----------------|----------|------------------------------------|--------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sacral         | L4 to S3 | Back of legs (thigh) and buttocks) | Pudendal continued | S2 to S4 | <p>Sphincters (little doors) muscles of the bladder (stores urine/pee/wee)</p> <p>Sphincters of the muscles of the rectum (stores poo/faeces/stools)</p> | External genital in both genders penis for men and clitoris for women and most of perineum. | The ischiocavernosus is narrow, long superficial perineal skeletal muscle that is found in the perineal space of the urogenital (the renal/reproductive system). It helps maintain how the penis erects in males and how clitoris erects in females. It is a paired muscle. |



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Additional information for anyone interested.

Though there are five major nerves of the sacral plexus, there are smaller branches that supply the muscles and the belly.

| Name of smaller nerve of the sacral plexus                                                                                                                                                                                   | Root      | Where are they supplying to? | Innervation                                                                                                                                                                                                                                                                                                              | Detail                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Perforating cutaneous nerve</b><br><br>It is called perforating because the nerve perforates the fascia/thin layer covering of the gluteal region. This allows it to reach the skin where it provides sensory innervation | S2 and S3 | Skin                         | Abdominal/Pelvic viscera<br><br>The nerve passes through the sacrotuberous ligament – a strong fibrous structure.<br><br>The ligaments connects or is between the sacrum and ischial tuberosity which is a bony part of the lower pelvis.<br><br>The nerve goes down the lower gluteal region superficially on the skin. | The nerve supplies the skin over the inferior gluteal region (lower buttocks) and pelvic splanchnic nerves.<br><br>The sacral splanchnic nerves connect to the inferior hypogastric plexus where they innervate the pelvic viscera. This includes the bladder, rectum and reproductive organs.<br><br>This is because the inferior hypogastric plexus is anterior to the sacrum and near the rectum and serves pelvic organs. |



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|                             |           |         |                                                                                         |                                                                                                                                                                                                                                                                               |
|-----------------------------|-----------|---------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |           |         | It has sensory innervation but no motor function                                        | <p>The sympathetic fibers from the sacral splanchnic nerves convert to parasympathetic fibers of the pelvic splanchnic nerves.</p> <p>Roles in Touch, pressure, light, tempoeature, proprioception movement.</p>                                                              |
| Nerve to piriformis         | S1 and S2 | Muscles | Anterior surface of the sacrum, down the muscle to the greater trochanter of the femur. | <p>Piriformis muscle (posterior hip region)</p> <p>It aids in rotating the thigh laterally.</p> <p>This helps when walking, running and maintaining balance. It also helps with hip abduction when lifting leg.</p> <p>It stabilises the hip socket via the femoral head.</p> |
| Nerve to obturator internus | L5 to S2  | Muscles | Internal obturator and Superior Gemellus Muscles                                        | <p>It exits the pelvis via sciatica foramen affecting these muscles.</p> <p>The internal obturator muscle abducts the thigh, externally rotate the extended thigh and stabilises the hip while walking.</p> <p>Superior gemellus externally rotates the thigh.</p>            |



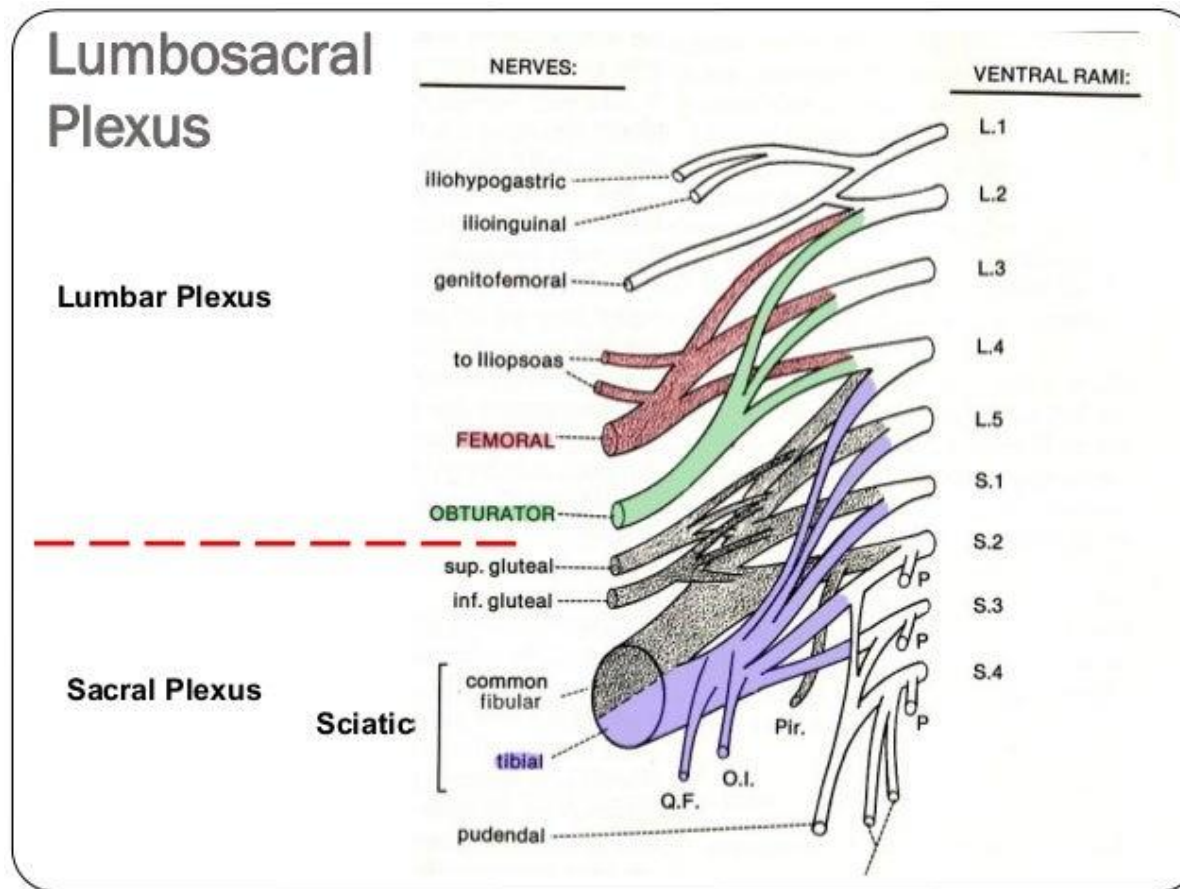
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|                            |          |         |                                                 |                                                                                                                                                                                                                            |
|----------------------------|----------|---------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nerve to quadratus femoris | L4 to S1 | Muscles | Quadratus femoris and inferior gemellus muscles | <p>It goes along the ischium of the pelvis behind the hip joint and innervates the muscles</p> <p>Quadratus femoris externally rotates and adducts the thigh.</p> <p>The inferior gemellus external rotates the thigh.</p> |
|----------------------------|----------|---------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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**Figure 1:** The Lumbosacral trunk

Each nerve is subdivided into anterior and posterior nerve fibres.

The trunk consists of the ventral rami of the lumbar roots of 4<sup>th</sup> and 5<sup>th</sup> with the sacral plexus that begins with the anterior fibres of the spinal nerves S1 to S4.

The anterior rami of S1 to S4 spinal roots and the lumbosacral trunk divide into several cords.

These cords combine together to form the five major peripheral nerves of the sacral plexus.

The nerves go down the posterior pelvic wall where they leave the pelvis via the greater sciatic foramen which enter the gluteal region of the lower limb and innervate structures there or they remain in the pelvis and innervate pelvic muscles, organs and perineum.



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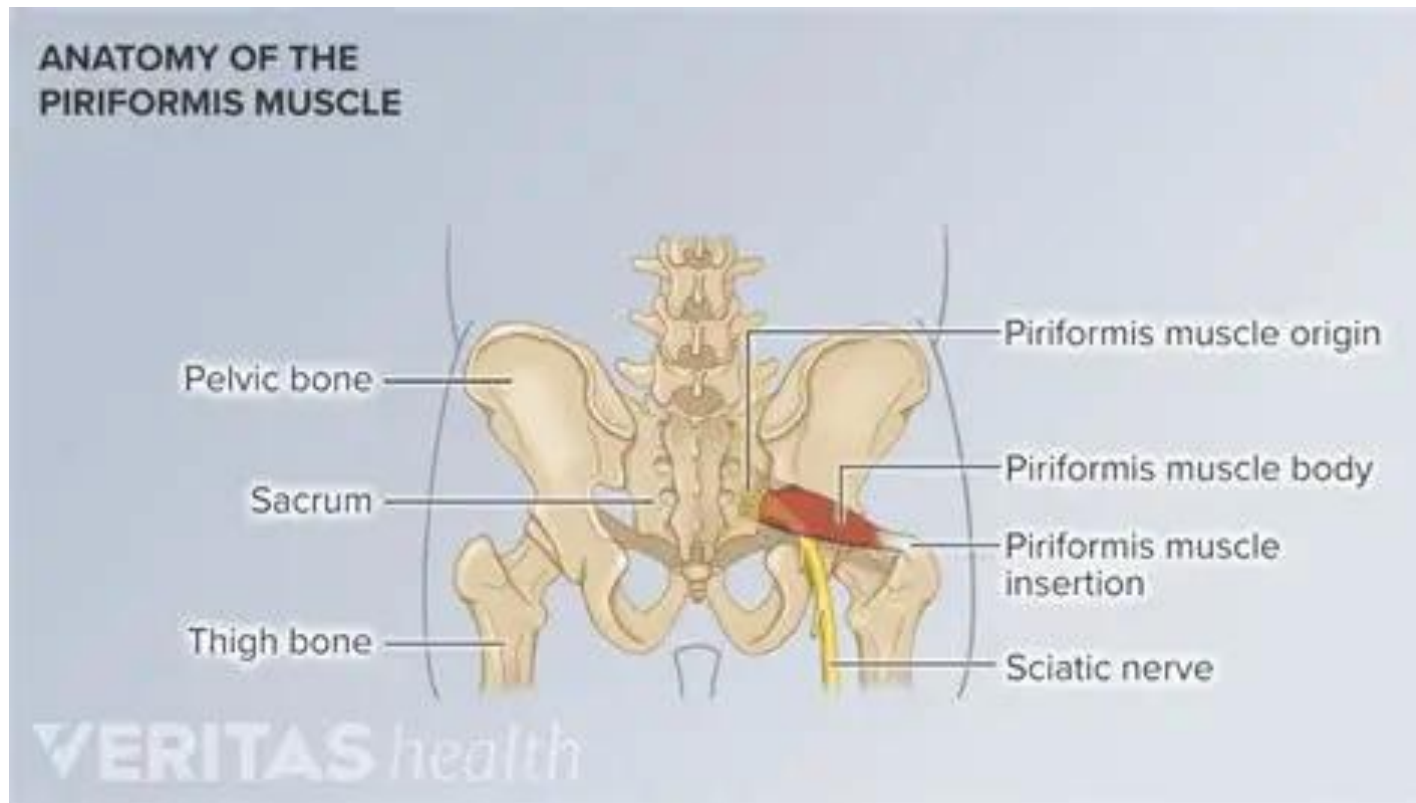


Figure 2: The structure of the piriformis muscle.

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# Muscular System

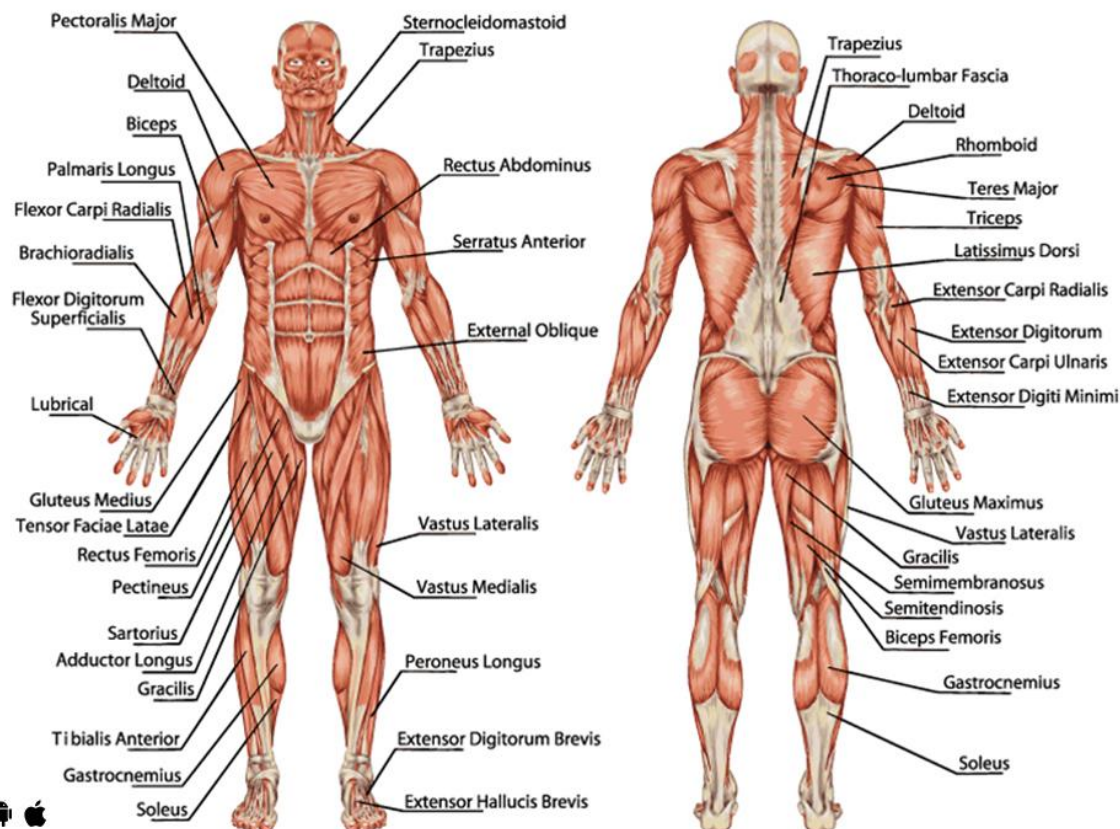


Figure 3: The anterior and posterior of the muscular system



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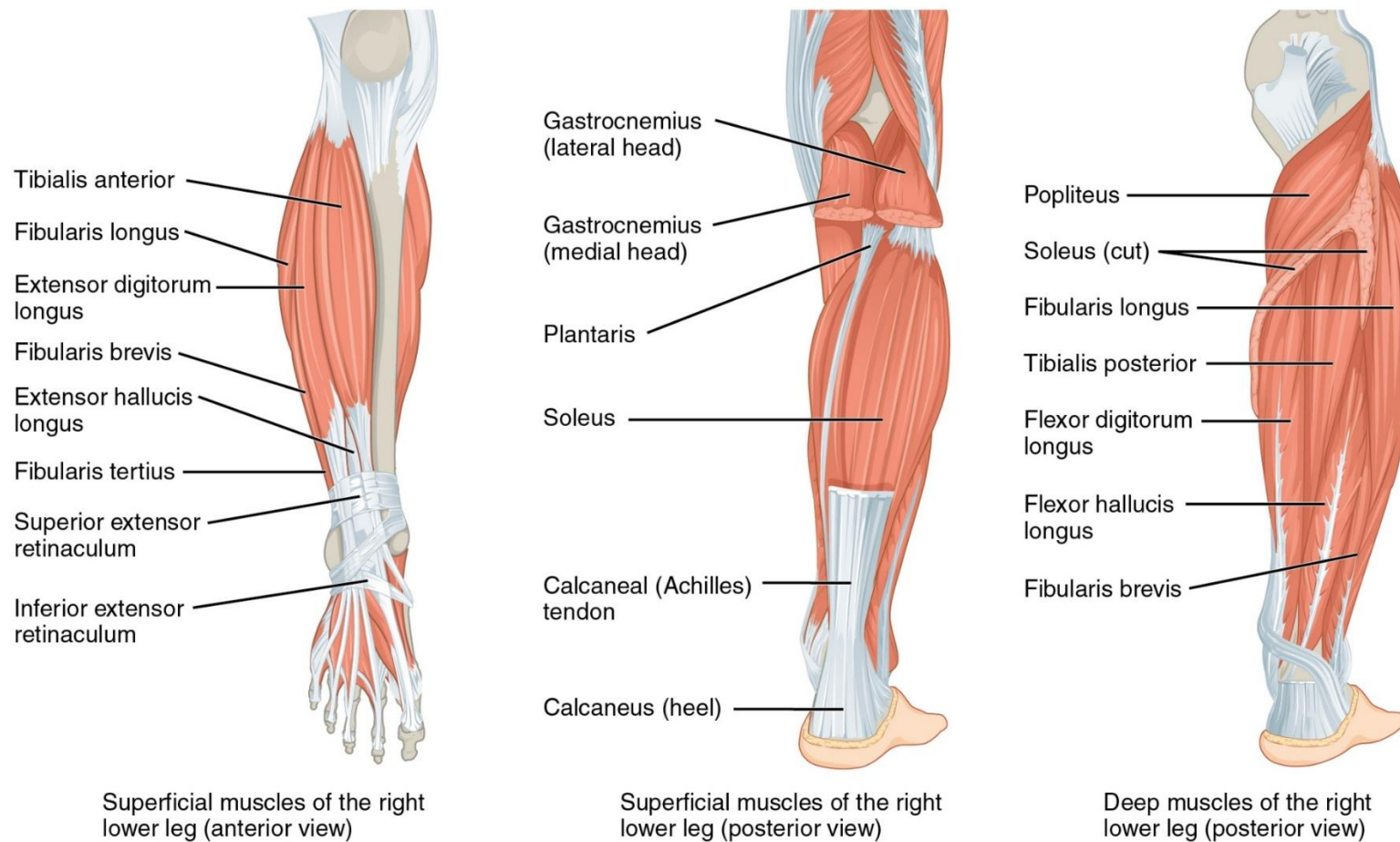


Figure 4: The muscles of the lower leg



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### TENSOR FASCIAE LATAE

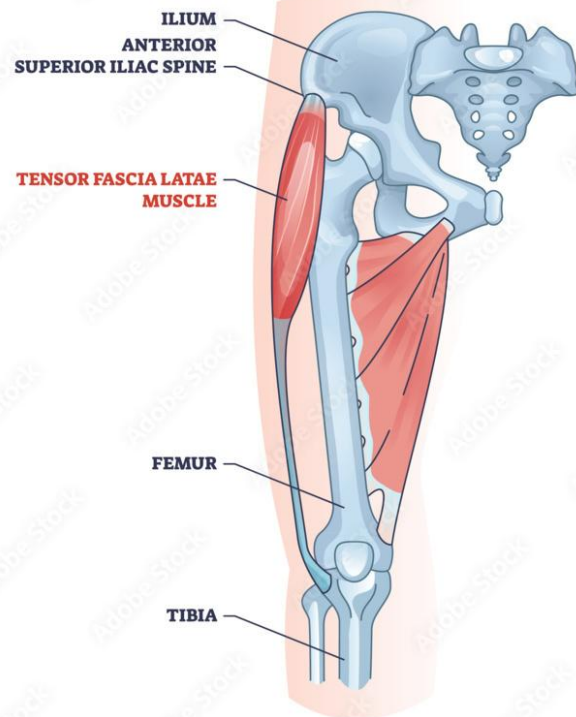


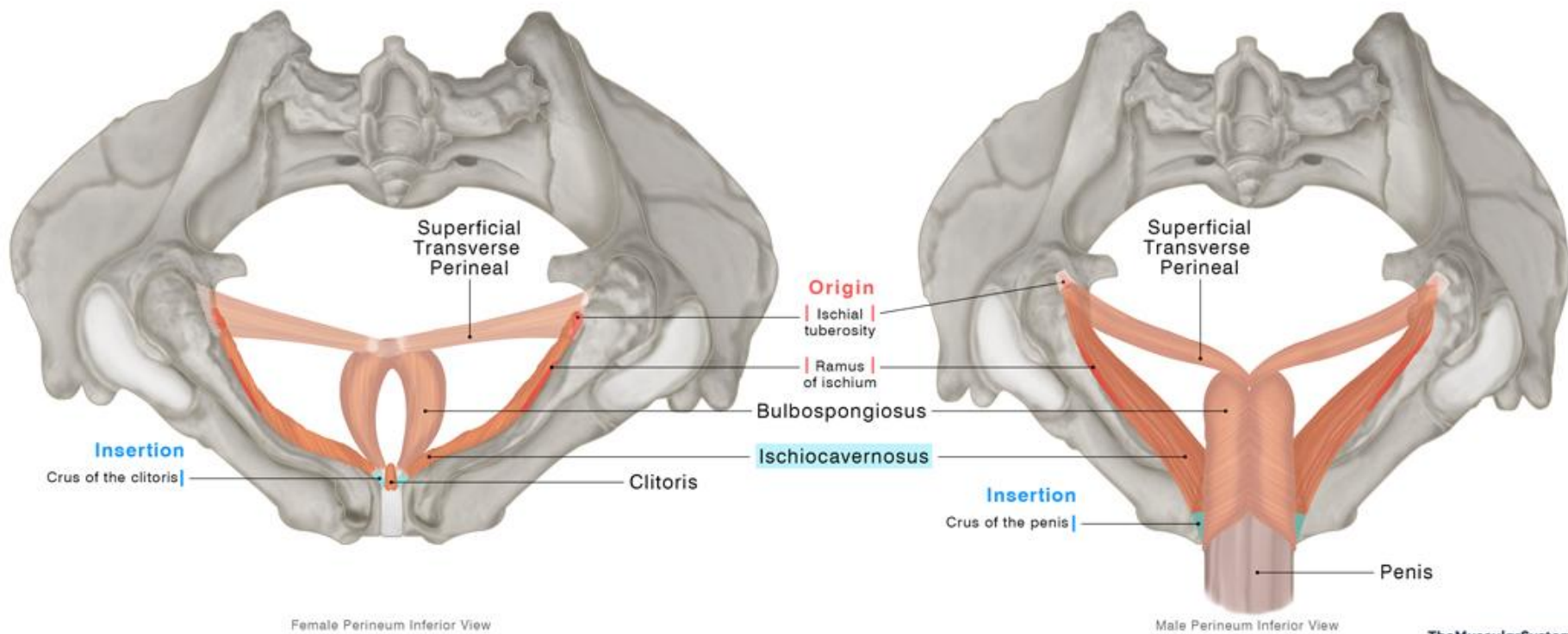
Figure 5: The tensor fasciae latae which is one of the targets for the innervation of the superior gluteal nerve.

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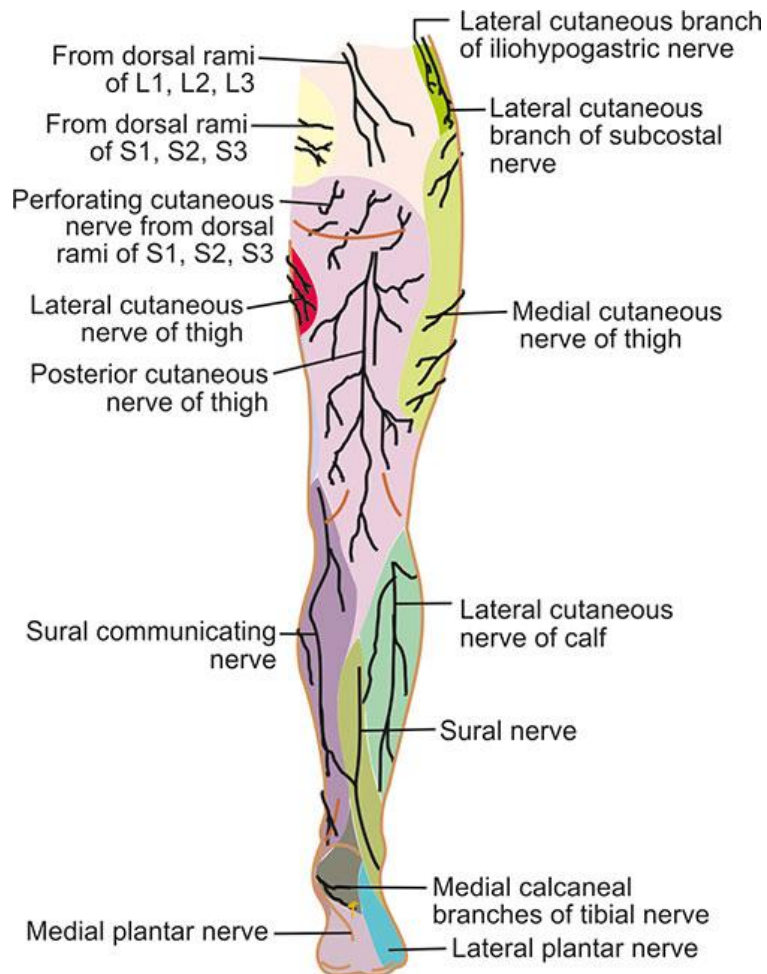
Figure 6: The ischioavernosus and the bulbospongiosus muscles where the pudendal nerve innervates.

### Ischiocavernosus



## Sacral Plexus

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### Smaller nerves of the sacral plexus

Figure 7: The perforating cutaneous nerve and other cutaneous nerves are presented of the posterior (back) of the leg. It can be seen connected to the fascia/covering of the gluteal region.

The posterior cutaneous nerve of the thigh/femoral is one of the major nerves of the sacral plexus.

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### Sympathetic Splanchnic Nerves

#### Abdominopelvic splanchnic nn.

**Greater splanchnic n**  
T5-T9 spinal cord segment

**Lesser splanchnic n**  
T10-T11 spinal cord segment

**Least splanchnic n**  
T12 spinal cord segment

**Lumbar splanchnic n**  
L1-L2 spinal cord segment

**Sacral splanchnic n**  
L1-L2 spinal cord segment

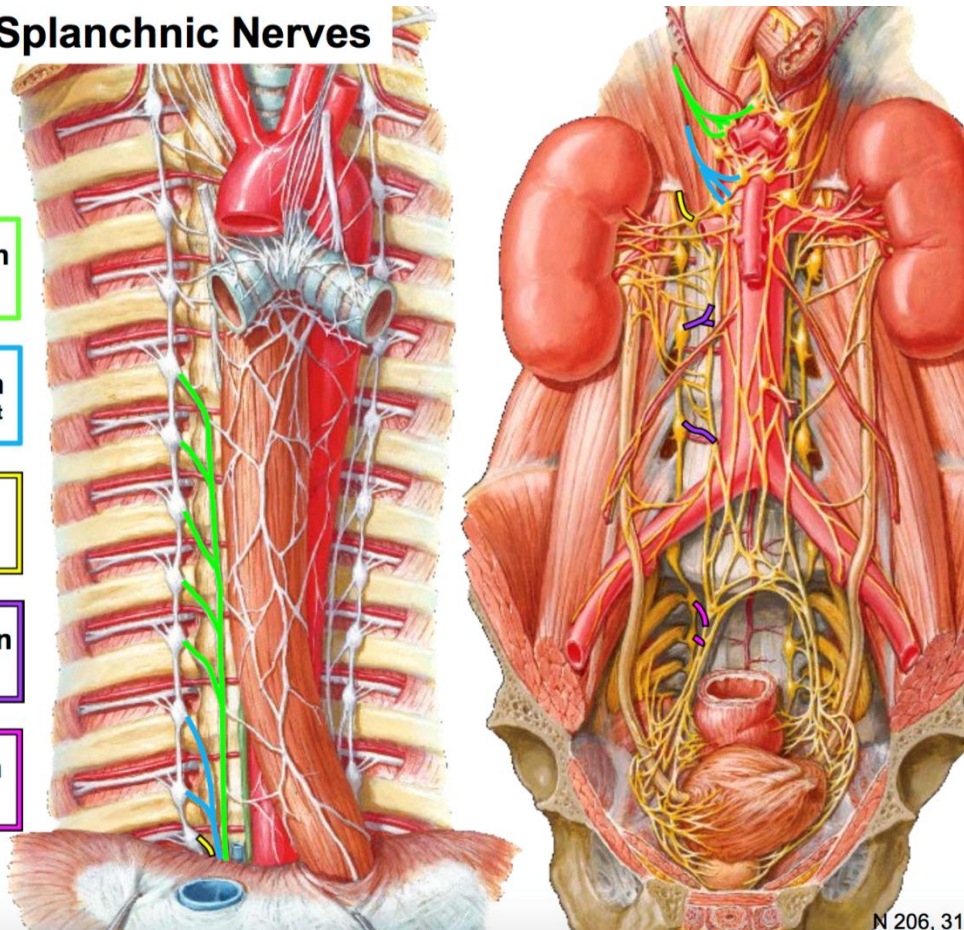


Figure 8: The splanchnic nerves

They innervate the abdominal and pelvic viscera which helps the organs situated there.

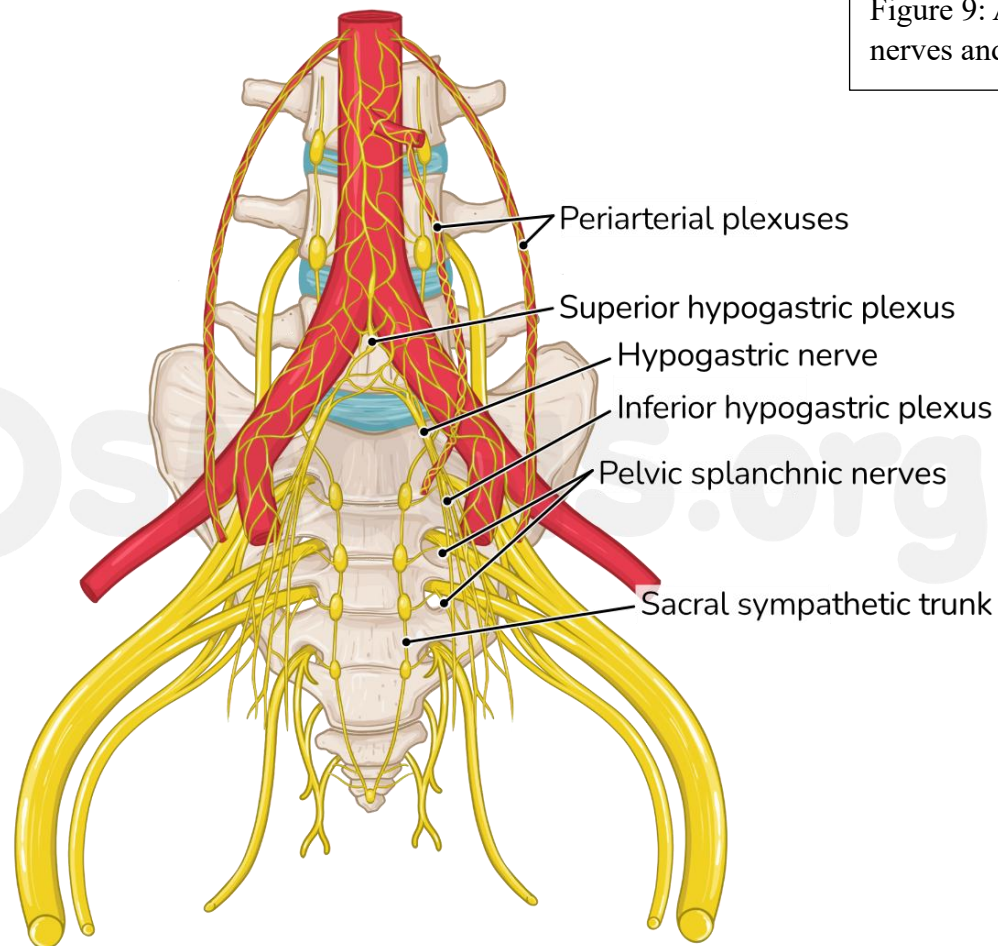
The lumbar splanchnic nerves function in the abdominal viscera where they enter the retroperitoneum cavity.

On the other hand, the sacral splanchnic nerves go down the hypoglastic region and join the pelvic splanchnic nerves.

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Figure 9: A closer insight into the splanchnic nerves and the hypogastric plexus



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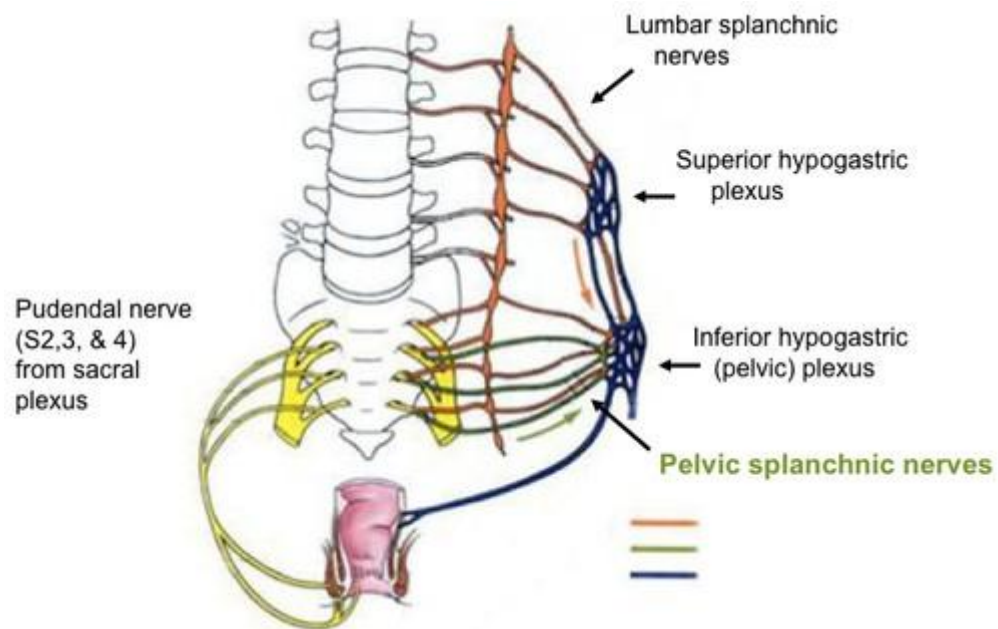


Figure 10: Alternative illustration of the splanchnic nerves, hypogastric plexus and pudendal nerve.

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### Pelvic splanchnic nerve

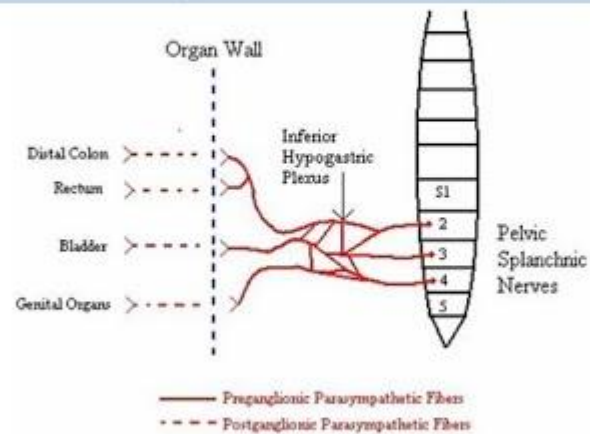


Figure 11: The functional role of the pelvic splanchnic nerves targeting the pelvic organs.

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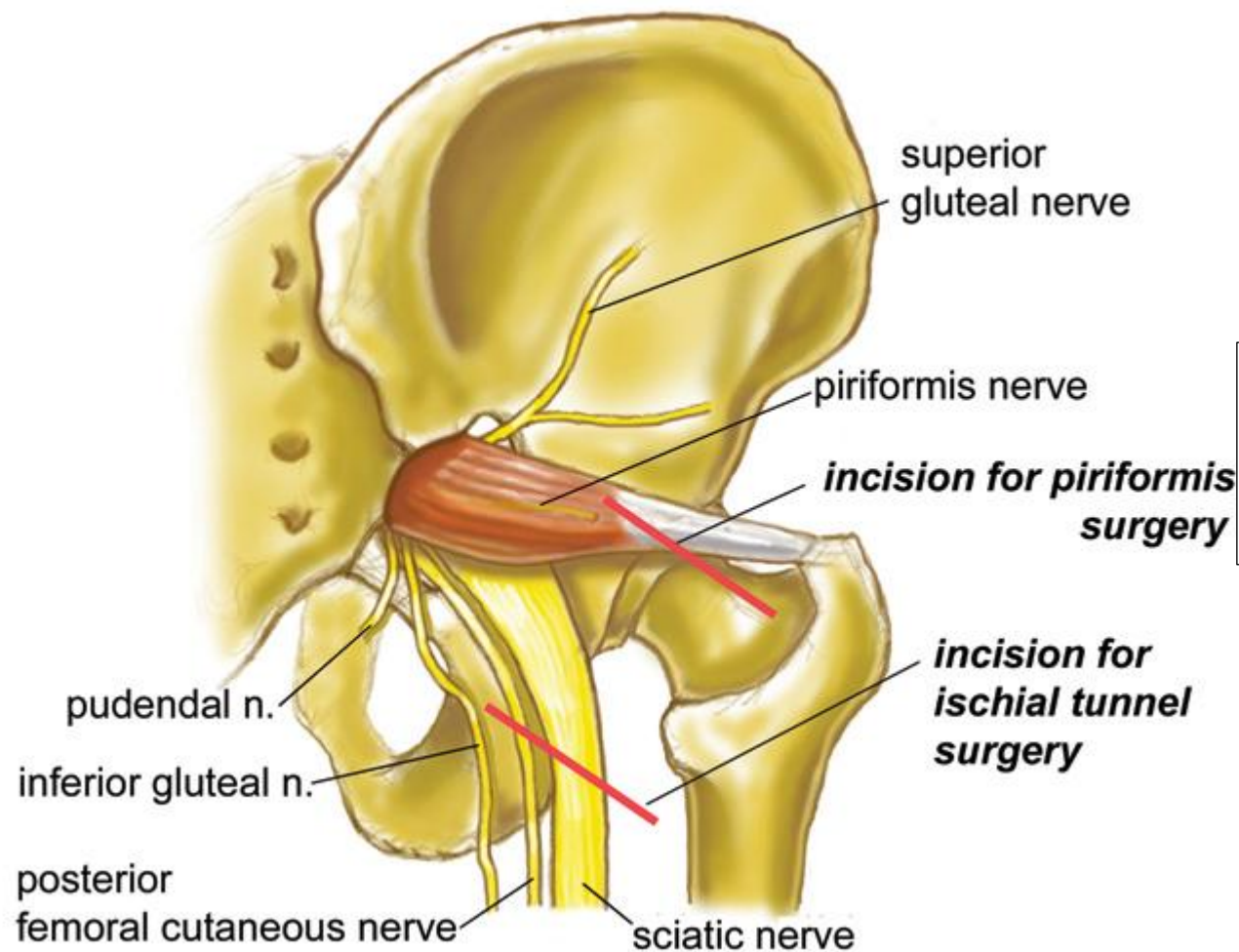


Figure 12: A closer view of the piriformis nerve inside the piriformis muscle.



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## Piriformis & Obturator Internus (Origin)

B

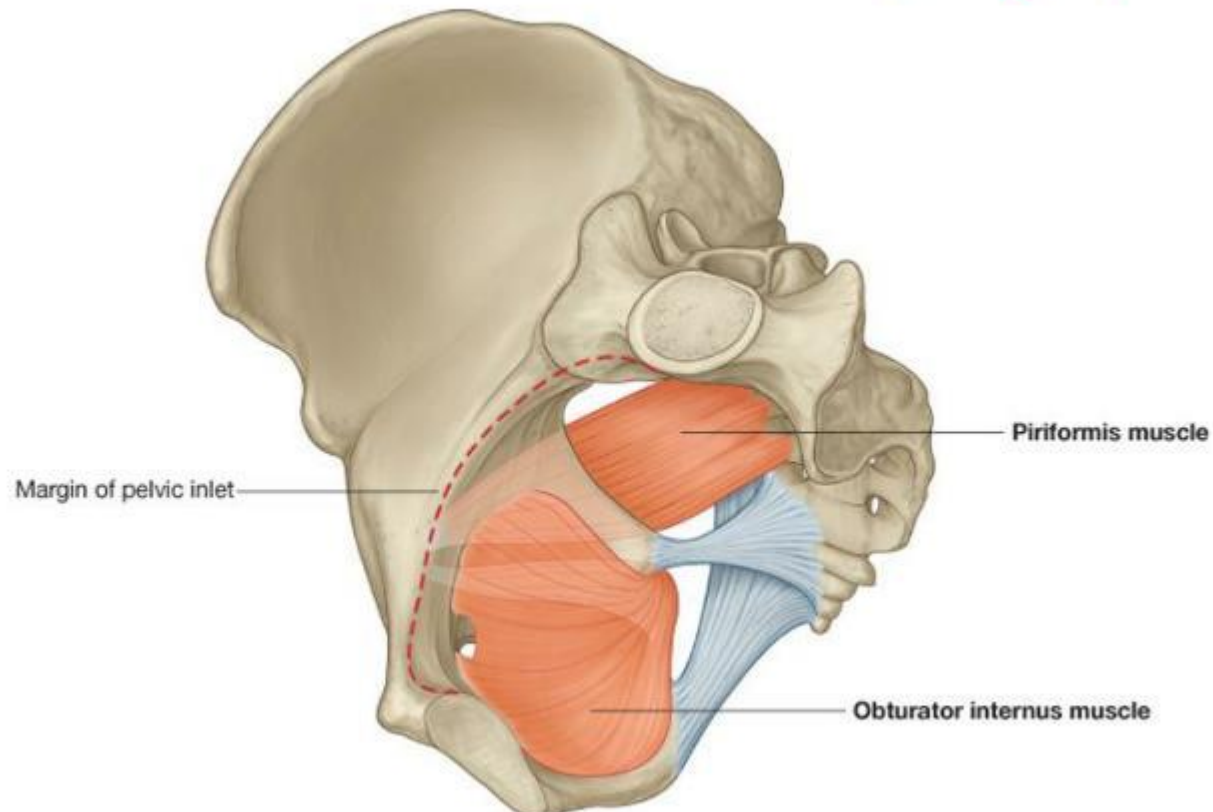


Figure 12: A closer view of the piriformis muscles and obturator internus

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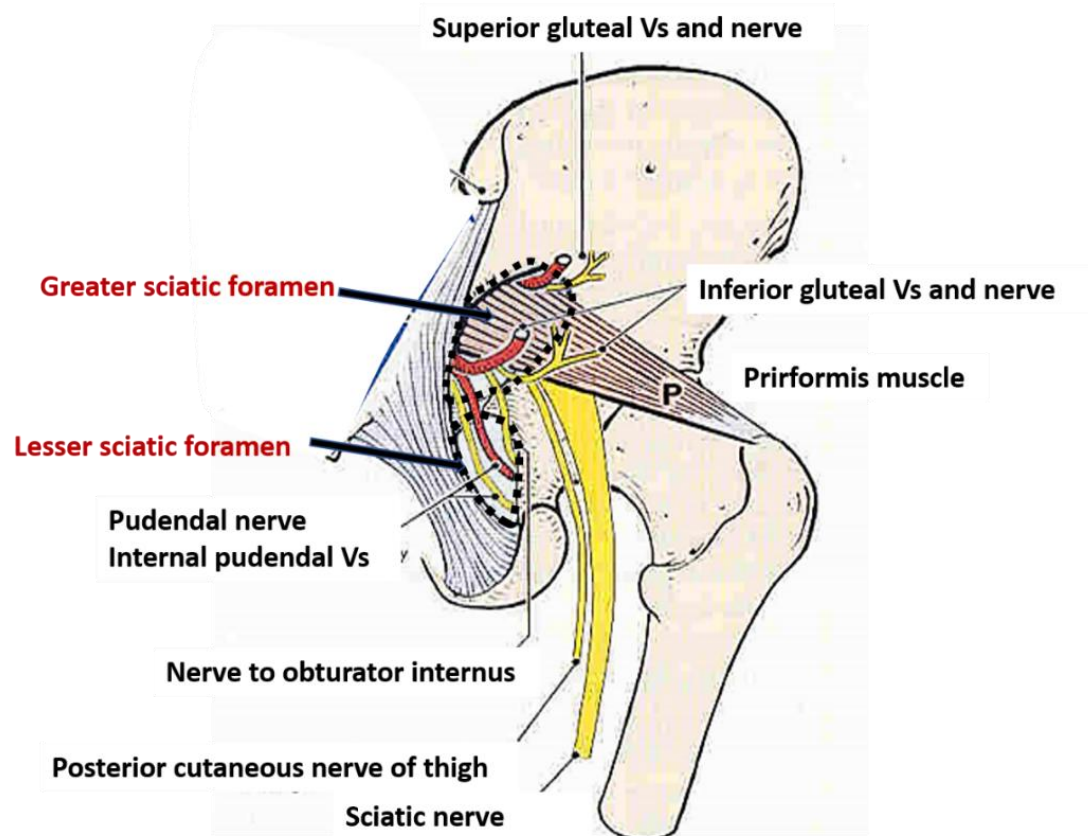


Figure 13: A closer view of the nerve to obturator internus



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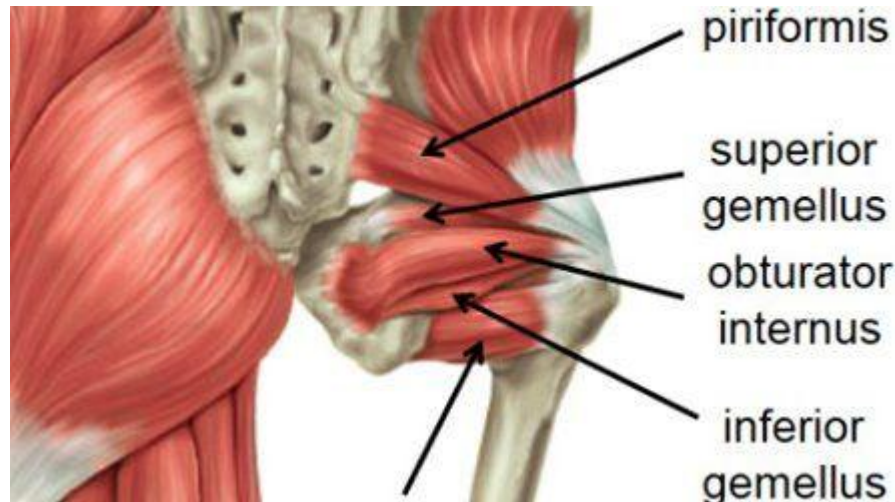


Figure 14: A closer view of the coxae triceps: superior gemellus, obturator internus and inferior gemellus.

The triceps coxae are small muscles that form the triceptal muscle called triceps coxae.

It is situated between piriformis and quadratus femoris muscles.

There is a tendon that runs horizontally to the greater trochanter (thicker part) of the thigh bone/femur.

Inferior gemellus is a small deep gluteal muscle that assists the lateral rotation and abduction of the hip while stabilising the femoral head.

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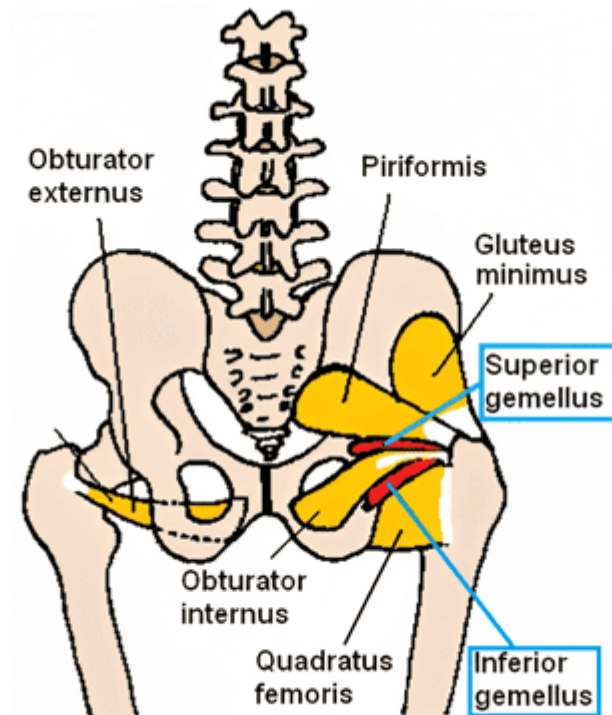


Figure 15: An alternative view of the coxae triceps: superior gemellus, obturator internus and inferior gemellus.

Gluteus minimus and quadratus femoris and piriformis muscles can be observed.



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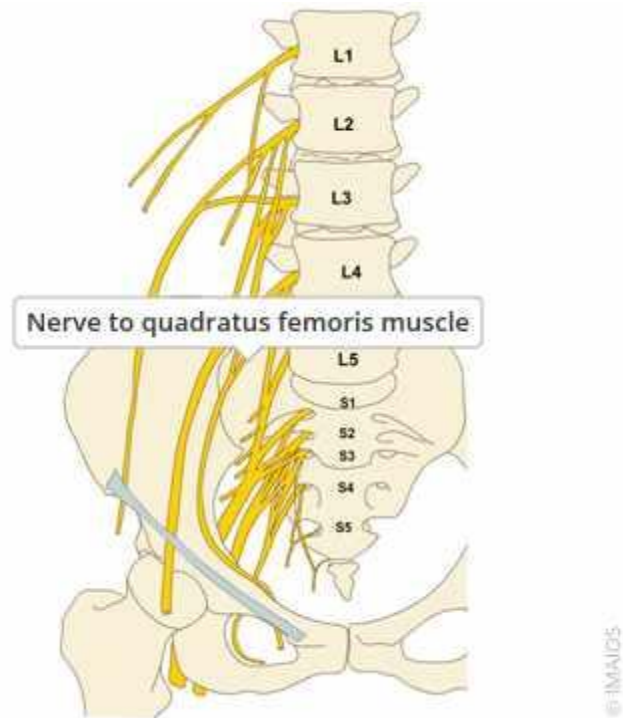


Figure 16: The nerve to quadratus femoris muscle (L4 to S1 root).

It affects the quadratus femoris muscle and the gemellus inferior muscle.

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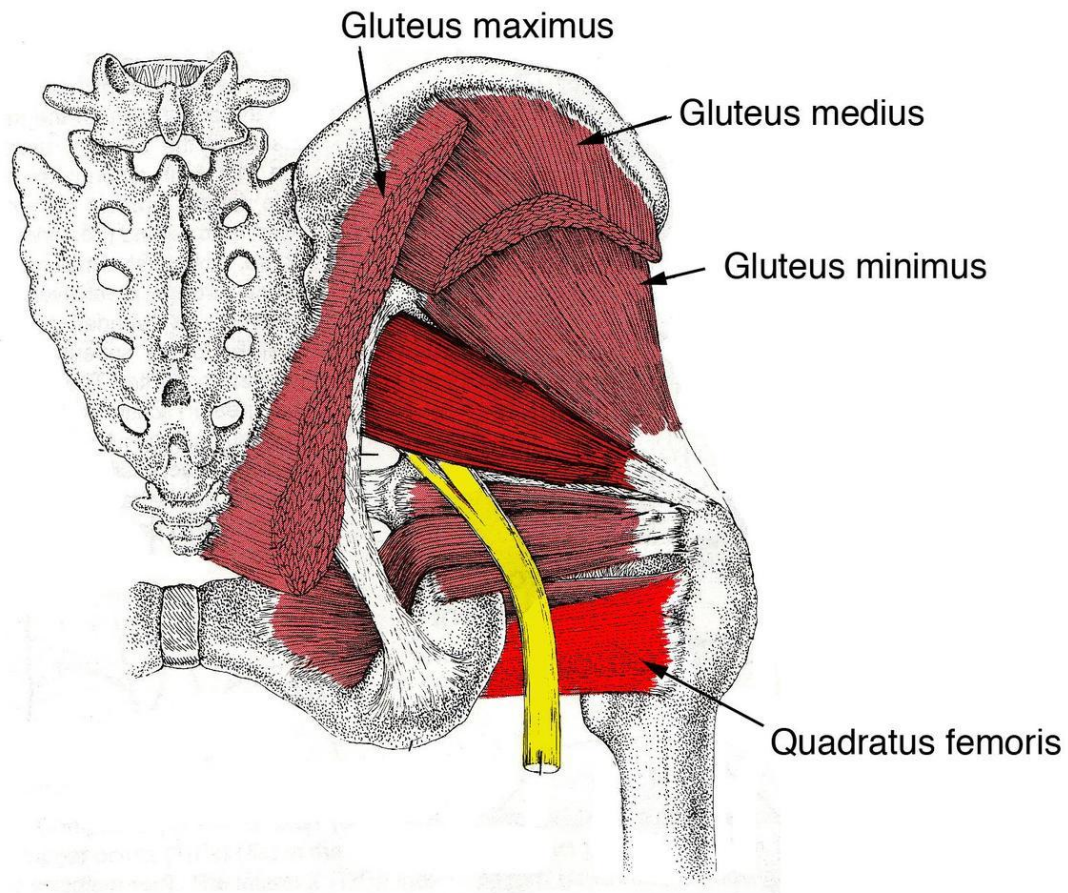


Figure 17: An alternative presentation of the muscles in the gluteal regions and the quadratus femoris