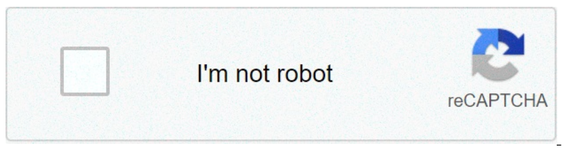

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L4 innervated muscles

The sacral plexus is formed by the union of the lumbosacral trunk (from the anterior rami of L4 and L5) and the anterior rami of the first, second, third, and fourth sacral nerves. The anterior rami of the upper 4 sacral nerves enter the pelvis through the anterior sacral foramina; the anterior rami of the fifth sacral nerve enter between the sacrum and coccyx. [1] (See the following image.) Sacral plexus, anterior view. The nerves forming the sacral plexus converge toward the lower part of the greater sciatic foramen and unite to form a flattened band. The band continues primarily as the sciatic nerve, which splits in the back of the thigh into the tibial nerve and common fibular nerve. These 2 nerves sometimes arise separately from the plexus, and in all cases their independence can be shown by dissection. The anterior rami of the first and second sacral nerves are large; the third, fourth, and fifth diminish progressively in size. Each receives a gray ramus communicans from the corresponding ganglion of the sympathetic trunk. From the second, third, and fourth sacral nerves, a pelvic splanchnic nerve is given to the inferior hypogastric plexus. These are parasympathetic fibers that supply the hindgut and the pelvic viscera. The sacral plexus lies in the back of the pelvis between the piriformis muscle and the pelvis fascia. In front of it are the internal iliac artery, internal iliac vein, the ureter, and the rectum. The superior gluteal artery and vein usually run between the lumbosacral trunk and the first sacral nerve, and the inferior gluteal artery and vein often runs between the second and third sacral nerves. All the nerve roots entering the plexus split into anterior and posterior divisions, and the nerves arising from these are as follows (see the image below): Nerve to quadratus femoris and gemellus inferior: L4-S1 Nerve to obturator internus and gemellus superior: L5-S2 Nerve to piriformis: S1, S2 Superior gluteal nerve: L4-S1 Inferior gluteal nerve: L5-S2 Posterior femoral cutaneous nerve: S1-S3 The nerve to the quadratus femoris and gemellus inferior arises from the anterior divisions of the fourth and fifth lumbar and first sacral nerve roots. It leaves the pelvis through the greater sciatic foramen, below the piriformis, and runs down in front of the sciatic nerve, the gemelli, and the tendon of the obturator internus, then enters the anterior surfaces of the quadratus femoris and gemellus inferior muscles. This nerve gives an articular branch to the hip joint. The nerve to the obturator internus and gemellus superior arises from the anterior division of the fifth lumbar and first and second sacral nerve roots. It leaves the pelvis through the greater sciatic foramen below the piriformis and gives off the branch to the gemellus superior, entering the upper part of the posterior surface of this muscle. This nerve then crosses the ischial spine, enters the perineum through the lesser sciatic foramen, and pierces the pelvic surface of the obturator internus muscle. The nerve to the piriformis arises from the posterior divisions of the first and second sacral nerve roots and enters the anterior surface of the muscle. The superior gluteal nerve arises from the posterior divisions of the fourth and fifth lumbar and first sacral nerve roots. It leaves the pelvis through the greater sciatic foramen above the piriformis, accompanied by the superior gluteal vessels, and divides into a superior and an inferior branch. The superior branch accompanies the upper branch of the deep division of the superior gluteal artery and ends in the gluteus minimus. The inferior division gives filaments to the gluteus medius and minimus and ends in the tensor fascia lata. The inferior gluteal nerve arises from the posterior divisions of the fifth lumbar and first and second sacral nerve roots. It leaves the pelvis through the greater sciatic foramen, below the piriformis, and divides into branches that enter the deep surface of the gluteus maximus. The posterior femoral cutaneous nerve is distributed to the skin of the perineum and posterior surface of the lower portion of the buttock, thigh, and leg (see the following image). It arises partly from the posterior divisions of the first and second sacral nerve roots and from the anterior divisions of the second and third sacral nerve roots. Diagram of the segmental distribution of the cutaneous nerves of the lower extremity. The posterior femoral cutaneous nerve continues from the pelvis through the greater sciatic foramen below the piriformis; it then descends beneath the gluteus maximus with the inferior gluteal artery and runs down the back of the thigh beneath the fascia lata and over the long head of the biceps femoris to the back of the knee. Here, it pierces the deep fascia and accompanies the small saphenous vein to about the middle of the back of the leg, with its terminal twigs communicating with the sural nerve. Its branches are all cutaneous and are distributed to the gluteal region, the perineum, and the back of the thigh and leg, as follows: Inferior cluneal branches turn upward around the lower border of the gluteus maximus and supply the skin covering the lower and lateral part of that muscle Perineal braches curve forward below and in front of the ischial tuberosity, pierce the fascia lata, and run forward beneath the superficial fascia of the perineum to the skin of the scrotum in the male and of the labium majus in the female Branches to the back of the thigh and leg consist of numerous filaments derived from both sides of the nerve and distributed to the skin covering the back and medial side of the thigh, the popliteal fossa, and the upper part of the back of the leg The sciatic supplies nearly the whole of the skin of the leg, the muscles of the back of the thigh, and those of the leg and foot. It is the largest nerve in the body, measuring 2 cm in breadth, and is also the continuation of the flattened back of the sacral plexus. The sciatic nerve passes out of the pelvis through the greater sciatic foramen, below the piriformis muscle. It descends between the greater trochanter of the femur and the tuberosity of the ischium and along the back of the thigh to about its lower third, where it divides into 2 large branches, the tibial and common fibular (peroneal) nerves (see the image below). This division may take place at any point between the sacral plexus and the lower third of the thigh. The sciatic nerve supplies the hamstring muscles and all of the muscles and skin of the leg and foot via its 2 branches, the tibial and common fibular nerves. Sacral plexus, posterior view of lower extremity. The tibial nerve is the larger of the 2 terminal branches of the sciatic nerve. It arises from the anterior branches of the fourth and fifth lumbar and first, second, and third sacral nerve roots. This nerve descends along the back of the thigh and through the middle of the popliteal fossa to the lower part of the popliteus muscle, where it passes with the popliteal artery beneath the arch of the soleus. The tibial nerve then runs along the back of the leg with the posterior tibial vessels to the interval between the medial malleolus and the heel, where it divides beneath the flexor retinaculum (laciniate ligament) into the medial and lateral plantar nerves. In the thigh, it is overlapped by the hamstring muscles above and then becomes more superficial and lies lateral to, and some distance from, the popliteal vessels. Opposite the knee joint, the tibial nerve is in close relation with these vessels, and crosses to the medial side of the artery. In the leg, it is covered in the upper part of its course by the muscles of the calf; lower down, it is covered by the skin, the superficial and deep fascia. The tibial nerve is placed on the deep muscles and lies at first to the medial side of the posterior tibial artery but soon crosses that vessel and descends on its lateral side as far as the ankle. In the lower third of the leg, it runs parallel with the medial margin of the tendo calcaneus. Branches of the tibial nerve Articular branches supply the hip joint. Muscular branches in the thigh supply the semitendinosus, semimembranosus, long head of the biceps femoris, and the ischiocondylar portion of the adductor magnus muscles Articular branches, usually 3 in number, also supply the knee joint; 2 of these accompany the superior and inferior medial genicular arteries, and a third supplies the middle genicular artery. Just above the bifurcation of the nerve, an articular branch is given off to the ankle joint. Muscular branches, 4-5 in number, arise from the nerve as it lies between the 2 heads of the gastrocnemius muscle and supply that muscle and the plantaris, soleus, and popliteus muscles. The branch for the popliteus turns around the lower border of the popliteus and is distributed to the deep surface of the muscle. Lower down, muscular branches arise separately or by a common trunk and supply the soleus, tibialis posterior, flexor digitorum longus, and flexor hallucis longus. The branch to the flexor hallucis longus accompanies the fibular (peroneal) artery, whereas that to the soleus enters the deep surface of the muscle. The medial sural cutaneous nerve descends between the 2 heads of the gastrocnemius, and, at the level of the middle of the back of the leg, pierces the deep fascia and unites with the communicating ramus of the lateral sural cutaneous branch of the common fibular (peroneal) nerve to form the sural nerve. The sural nerve is formed by the junction of the medial sural cutaneous with the fibular (peroneal) communicating branch. It passes downward near the lateral margin of the tendo calcaneus, lying close to the small saphenous vein, to the space between the lateral malleolus and the calcaneus. The sural nerve runs forward below the lateral malleolus and continues as the lateral dorsal cutaneous nerve along the lateral side of the foot and little toe, communicating on the dorsum of the foot with the intermediate dorsal cutaneous nerve, a branch of the superficial fibular (peroneal). Medial calcaneal branches perforate the flexor retinaculum (laciniate ligament) and supply the skin of the heel and medial side of the sole of the foot. The medial plantar nerve is the larger of the 2 terminal divisions of the tibial nerve and accompanies the medial plantar artery. From its origin under the flexor retinaculum (laciniate ligament), the medial plantar nerve passes under cover of the abductor hallucis and appears between this muscle and the flexor digitorum brevis. It gives off a proper plantar digital nerve and divides opposite the bases of the metatarsal bones into 3 common plantar digital nerves. The branches of the medial plantar nerve are as follows: The cutaneous branches pierce the plantar aponeurosis between the abductor hallucis and the flexor digitorum brevis and are distributed to the skin of the sole of the foot The muscular branches supply the abductor hallucis, the flexor digitorum brevis, the flexor hallucis brevis, and the first lumbrical; those supplying the abductor hallucis and flexor digitorum brevis arise from the trunk of the nerve near its origin and enter the deep surfaces of the muscles; the branch of the flexor hallucis brevis springs from the proper plantar digital nerve to the medial side of the great toe, and that supplying the first lumbrical from the first common plantar digital nerve The articular branches supply the articulations of the tarsus and metatarsus The proper plantar digital nerve of the great toe supplies the flexor hallucis brevis and the skin on the medial side of the great toe; each proper plantar digital nerve gives off cutaneous and articular filaments; opposite the last phalanx, these digital nerves send upward a dorsal branch, which supplies the structures around the nail; the continuation of these nerves are distributed to the ball of the toe The 3 common plantar digital nerves pass between the divisions of the plantar aponeurosis, and each splits into 2 proper plantar digital nerves; those of the first common plantar digital nerve supply the adjacent sides of the great and second toes, whereas those of the second supply the adjacent sides of the second and third toes, and those of the third similarly supply the adjacent sides of the third and fourth toes; the third common plantar digital nerve receives a communicating branch from the lateral plantar nerve, whereas the first gives a twig to the first lumbrical muscle The lateral plantar nerve supplies the skin of the fifth toe and lateral half of the fourth toe, as well as most of the deep muscles. It passes with the lateral plantar artery to the lateral side of the foot, lying between the flexor digitorum brevis and quadratus plantae and, in the interval between the former muscle and the abductor digit minimi quinti, divides into a superficial and a deep branch. Before its division, it supplies the quadratus plantae and abductor digit minimi quinti. The superficial branch of the lateral plantar nerve splits into a proper and a common plantar digital nerve; the proper plantar digital nerve supplies the lateral side of the little toe, the flexor digit minimi (quinti) brevis, and the 2 interossei of the fourth intermetatarsal space. The common plantar digital nerve communicates with the third common plantar digital branch of the medial plantar nerve and divides into 2 proper plantar digital nerves that supply the adjoining sides of the fourth and fifth toes. Lumbar nervesPlan of lumbar plexus.DetailsIdentifiersLatinnervi lumbalesTA98A14.2.05.001TA26489FMA5861Anatomical terms of neuroanatomy[edit on Wikidata] The lumbar nerves are the five pairs of spinal nerves emerging from the lumbar vertebrae. They are divided into posterior and anterior divisions. Structure Main article: Spinal nerves The lumbar nerves are five spinal nerves which arise from either side of the spinal cord below the thoracic spinal cord and above the sacral spinal cord. They arise from the spinal cord between each pair of lumbar spinal vertebrae and travel through the intervertebral foramina. The nerves then split into an anterior branch, which travels forward, and a posterior branch, which travels backwards and supplies the area of the back. Posterior divisions The middle divisions of the posterior branches run close to the articular processes of the vertebrae and end in the multifidus muscle. The outer branches supply the erector spinae muscles. The nerves give off branches to the skin. These pierce the aponeurosis of the greater trochanter. Anterior divisions The anterior divisions of the lumbar nerves (Latin: rami anteriores) increase in size from above downward. The anterior divisions communicate with the sympathetic trunk. Near the origin of the divisions, they are joined by gray rami communicantes from the lumbar ganglia of the sympathetic trunk. These rami consist of long, slender branches which accompany the lumbar arteries around the sides of the vertebral bodies, beneath the Psoas major. Their arrangement is somewhat irregular: one ganglion may give rami to two lumbar nerves, or one lumbar nerve may receive rami (branches) from two ganglia. The first and second, and sometimes the third and fourth lumbar nerves are each connected with the lumbar part of the sympathetic trunk by a white ramus communicans. The nerves pass obliquely outward behind the Psoas major, or between its fasciculi, distributing filaments to it and the Quadratus lumborum. As the nerves travel forward, they create nervous plexuses. The first three lumbar nerves, and the greater part of the fourth together form the lumbar plexus. The smaller part of the fourth joins with the fifth to form the lumbosacral trunk, which assists in the formation of the sacral plexus. The fourth nerve is named the furcal nerve, from the fact that it is subdivided between the two plexuses. Divisions First lumbar nerve The first lumbar spinal nerve (L1)[1] originates from the spinal column from below the lumbar vertebra 1 (L1). The three terminal branches of this nerve are the iliohypogastric, ilioinguinal, and the genitofemoral nerves. L1 supplies many muscles, either directly or through nerves originating from L1. They may be innervated with L1 as single origin, or be innervated partly by L1 and partly by other spinal nerves. The muscles are: quadratus lumborum (partly) iliopsoas muscle (partly) Second lumbar nerve The second lumbar spinal nerve (L2)[2] originates from the spinal column from below the lumbar vertebra 2 (L2). L2 supplies many muscles, either directly or through nerves originating from L2. They may be innervated with L2 as single origin, or be innervated partly by L2 and partly by other spinal nerves. The muscles are: quadratus lumborum (partly) iliopsoas (partly) Third lumbar nerve The third lumbar spinal nerve (L3)[3] originates from the spinal column from below the lumbar vertebra 3 (L3). L3 supplies many muscles, either directly or through nerves originating from L3. They may be innervated with L3 as single origin, or be innervated partly by L3 and partly by other spinal nerves. The muscles are: quadratus lumborum (partly) iliopsoas (partly) obturator externus (partly) Fourth lumbar nerve The fourth lumbar spinal nerve (L4)[4] originates from the spinal column from below the lumbar vertebra 4 (L4). L4 supplies many muscles, either directly or through nerves originating from L4. They are not innervated with L4 as single origin, but partly by L4 and partly by other spinal nerves. The muscles are: quadratus lumborum gluteus medius muscle gluteus minimus muscle tensor fasciae latae obturator externus inferior gemellus quadratus femoris tibialis anterior Fifth lumbar nerve The fifth lumbar spinal nerve 5 (L5)[5] originates from the spinal column from below the lumbar vertebra 5 (L5). L5 supplies many muscles, either directly or through nerves originating from L5. They are not innervated with L5 as single origin, but partly by L5 and partly by other spinal nerves. The muscles are: gluteus maximus muscle mainly S1 gluteus medius muscle gluteus minimus muscle tensor fasciae latae tibialis anterior tibialis posterior extensor digitorum brevis extensor hallucis longus Lumbar spinal nerve 3 Lumbar spinal nerve 4 Lumbar spinal nerve 5 The spinal cord with spinal nerves The plan of the lumbosacral plexus Function Areas of distribution of the cutaneous branches of the posterior divisions of the spinal nerves. The areas of the medial branches are in black, those of the lateral in red. Additional images The lumbar plexus and its branches. Lumbar spinal nerves.Deep dissection. Posterior view. See also Lumbar plexus References This article incorporates text in the public domain from page 924 of the 20th edition of Gray's Anatomy (1918) ^ American Medical Association Nervous System -- Groups of Nerves ^ American Medical Association Nervous System -- Groups of Nerves ^ American Medical Association Nervous System -- Groups of Nerves ^ American Medical Association Nervous System -- Groups of Nerves ^ American Medical Association Nervous System -- Groups of Nerves Hsu, Philip S., MD, Carmel Armon, MD, and Kerry Levin, MD. "Acute Lumbosacral Radiculopathy: Pathophysiology.Clinical, Features, and Diagnosis." www.uptodate.com. Uptodate, 11 Jan. 2011.Web. 26 Sept. 2012. Loizidez, Alexander, MD, Siegfried Peer, MD, Michaela Plaikner, MD, Verena Spiss, MD, and HannesGruber, MD. "Ultrasound-guided Injections in the Lumbar Spine." www.medultrason.ro. Medical Ultrasonography, 20 Jan. 2011. Web. 26 Sept. 2012. Zhu, Jie, MD, and Obi Onyewu, MD. "Alternative Approach for Lumbar Transforaminal Epidural Steroid Injections." www.painphysicianjournal.com. Pain Physician, 21 Apr. 2011. Web. 26 Sept. 2012. 14;331-341.pdf Retrieved from "