Nerve diagram

The nerves of the leg and foot serve to propel the body through the actions of the legs, feet, and toes while maintaining balance, both while the body is moving and when it is at rest. Sensory nerves are of course present throughout the lower extremities; however, with the exception of the bottom of the foot, they play a lesser role here than in the upper extremities. Primarily, this section of the peripheral nervous system sends and receives signals regarding locomotion and balance of the body. The motor regions of the brain and spinal cord control most of the nerve impulses that stimulate muscles in this region. However, many reflex pathways are also active in the legs and foot. The nerve signals in these reflexes come from stretch receptors located in the joints, ligaments, tendons, and even the muscles themselves. Reflexes help to maintain proper muscle tone, balance, and responsiveness of the legs and feet to stimuli such as stepping on a sharp object. The nerves of the leg and foot arise from spinal nerves connected to the spinal cord in the lower back and pelvis. As these nerves descend toward the thighs, they form two networks of crossed nerves known as the lumbar plexus and sacral plexus. The lumbar plexus forms in the lower back from the merger of spinal nerves L1 through L4 while the sacral plexus forms in the pelvic region from spinal nerves L4, L5, and S1 through S4. The femoral, saphenous, obturator, and lateral femoral cutaneous nerves all extend from the lumbar plexus into the muscles and skin of the thigh and leg. Each of these major nerves further divides into many smaller nerve branches to stimulate individual muscles and sense touch, pain, warmth, and cold in the skin. The branches of the femoral nerve serve the quadriceps muscles and skin of the anterior and medial thigh, while its largest branch, the saphenous nerve, extends to the skin of the medial leg and foot. The obturator nerve connects to the adductor muscles and skin in the groin, while the lateral femoral cutaneous nerve connects to the skin on the anterior, posterior, and medial regions of the thigh. It descends from the sacral plexus through the buttocks and into the thighs to supply nerve impulses to and from the muscles and skin in the hip joints and thighs, the lower legs, feet and most of the skin below the knee. Along its route through the legs, the sciatic nerve splits into the tibial and common fibular peroneal nerves, which in turn split into many smaller nerves in the legs and feet. All of these nerves extend as branches of nerves in the leg that pass through the ankle and into the foot. The sural nerve branches from the tibial and common fibular nerves and is responsible for feeling on the outside of the foot and the small toe. The medial and lateral plantar nerves are the two largest nerves in the bottom of the foot. Working together, the plantar nerves command the many small muscles of the feet and toes to create the constant, subtle shifting of the feet that keeps us from falling down. At the same time, these nerves deliver messages to the brain that bring information about the angles and position of joints, the length and tension of muscles, or even the speed of movements so that through the interaction of the nervous system with the muscles of the lower extremities, balance may be maintained. By: Tim Taylor. Last Updated: Jul 3, Now please check your email to confirm your subscription. There was an error submitting your subscription. Please try again. Email Address. All Rights Reserved. Innerbody Research does not provide medical advice, diagnosis, or treatment. You must consult your own medical professional. The nervous system consists of the brain, spinal cord, sensory organs, and all of the nerves that connect these organs with the rest of the body. Together, these organs are responsible for the control of the body and communication among its parts. The brain and spinal cord form the control center known as the central nervous system CNS , where information is evaluated and decisions made. The sensory nerves and sense organs of the peripheral nervous system PNS monitor conditions inside and outside of the body and send this information to the CNS. Efferent nerves in the PNS carry signals from the control center to the muscles, glands, and organs to regulate their functions. The majority of the nervous system is tissue made up of two classes of cells: neurons and neuroglia. Neurons, also known as nerve cells, communicate within the body by transmitting electrochemical signals. Neurons look quite different from other cells in the body due to the many long cellular processes that extend from their central cell body. The cell body is the roughly round part of a neuron that contains the nucleus, mitochondria, and most of the cellular organelles. Small tree-like structures called dendrites extend from the cell body to pick up stimuli from the environment, other neurons, or sensory receptor cells. Long transmitting processes called axons extend from the cell body to send signals onward to other neurons or effector cells in the body. Each neuron in the body is surrounded by anywhere from 6 to 60 neuroglia that protect, feed, and insulate the neuron. Because neurons are extremely specialized cells that are essential to body function and almost never reproduce, neuroglia are vital to maintaining a functional nervous system. The brain , a soft, wrinkled organ that weighs about 3 pounds, is located inside the cranial cavity, where the bones of the skull surround and protect it. The approximately billion neurons of the brain form the main control center of the body. The brain and spinal cord together form the central nervous system CNS , where information is processed and responses originate. The brain, the seat of

higher mental functions such as consciousness, memory, planning, and voluntary actions, also controls lower body functions such as the maintenance of respiration, heart rate, blood pressure, and digestion. The spinal cord is a long, thin mass of bundled neurons that carries information through the vertebral cavity of the spine beginning at the medulla oblongata of the brain on its superior end and continuing inferiorly to the lumbar region of the spine. The white matter of the spinal cord functions as the main conduit of nerve signals to the body from the brain. The grey matter of the spinal cord integrates reflexes to stimuli. Nerves are bundles of axons in the peripheral nervous system PNS that act as information highways to carry signals between the brain and spinal cord and the rest of the body. Each axon is wrapped in a connective tissue sheath called the endoneurium. Individual axons of the nerve are bundled into groups of axons called fascicles, wrapped in a sheath of connective tissue called the perineurium. Finally, many fascicles are wrapped together in another layer of connective tissue called the epineurium to form a whole nerve. The wrapping of nerves with connective tissue helps to protect the axons and to increase the speed of their communication within the body. The meninges are the protective coverings of the central nervous system CNS. They consist of three layers: the dura mater, arachnoid mater, and pia mater. CSF is formed from blood plasma by special structures called choroid plexuses. The choroid plexuses contain many capillaries lined with epithelial tissue that filters blood plasma and allows the filtered fluid to enter the space around the brain. Newly created CSF flows through the inside of the brain in hollow spaces called ventricles and through a small cavity in the middle of the spinal cord called the central canal. CSF also flows through the subarachnoid space around the outside of the brain and spinal cord. CSF is constantly produced at the choroid plexuses and is reabsorbed into the bloodstream at structures called arachnoid villi. What are known as the special sensesâ€"vision, taste, smell, hearing, and balanceâ€"are all detected by specialized organs such as the eyes , taste buds , and olfactory epithelium. Sensory receptors for the general senses like touch, temperature, and pain are found throughout most of the body. All of the sensory receptors of the body are connected to afferent neurons that carry their sensory information to the CNS to be processed and integrated. Did you know that DNA testing can help you discover your genetic risk of acquiring certain health conditions that affect the organs of our nervous system? The brain and spinal cord together form the central nervous system, or CNS. The CNS acts as the control center of the body by providing its processing, memory, and regulation systems. The CNS is also responsible for the higher functions of the nervous system such as language, creativity, expression, emotions, and personality. The brain is the seat of consciousness and determines who we are as individuals. The peripheral nervous system PNS includes all of the parts of the nervous system outside of the brain and spinal cord. These parts include all of the cranial and spinal nerves, ganglia, and sensory receptors. The SNS is the only consciously controlled part of the PNS and is responsible for stimulating skeletal muscles in the body. The ANS controls subconscious effectors such as visceral muscle tissue, cardiac muscle tissue, and glandular tissue. There are 2 divisions of the autonomic nervous system in the body: the sympathetic and parasympathetic divisions. The enteric nervous system ENS is the division of the ANS that is responsible for regulating digestion and the function of the digestive organs. The ENS receives signals from the central nervous system through both the sympathetic and parasympathetic divisions of the autonomic nervous system to help regulate its functions. Neurons function through the generation and propagation of electrochemical signals known as action potentials APs. An AP is created by the movement of sodium and potassium ions through the membrane of neurons. See Water and Electrolytes. A synapse is the junction between a neuron and another cell. Synapses may form between 2 neurons or between a neuron and an effector cell. There are two types of synapses found in the body: chemical synapses and electrical synapses. The axons of many neurons are covered by a coating of insulation known as myelin to increase the speed of nerve conduction throughout the body. In both cases, the glial cells wrap their plasma membrane around the axon many times to form a thick covering of lipids. The development of these myelin sheaths is known as myelination. Myelination speeds up the movement of APs in the axon by reducing the number of APs that must form for a signal to reach the end of an axon. The myelination process begins speeding up nerve conduction in fetal development and continues into early adulthood. Myelinated axons appear white due to the presence of lipids and form the white matter of the inner brain and outer spinal cord. White matter is specialized for carrying information quickly through the brain and spinal cord. The gray matter of the brain and spinal cord are the unmyelinated integration centers where information is processed. Reflexes are fast, involuntary responses to stimuli. Reflexes are integrated in the gray matter of the spinal cord or in the brain stem. Reflexes allow the body to respond to stimuli very quickly by sending responses to effectors before the nerve signals reach the conscious parts of the brain. This explains why people will often pull their

hands away from a hot object before they realize they are in pain. All sensory receptors can be classified by their structure and by the type of stimulus that they detect. Structurally, there are 3 classes of sensory receptors: free nerve endings, encapsulated nerve endings, and specialized cells. Free nerve endings are simply free dendrites at the end of a neuron that extend into a tissue. Pain, heat, and cold are all sensed through free nerve endings. An encapsulated nerve ending is a free nerve ending wrapped in a round capsule of connective tissue. When the capsule is deformed by touch or pressure, the neuron is stimulated to send signals to the CNS. Specialized cells detect stimuli from the 5 special senses: vision, hearing, balance, smell, and taste. Each of the special senses has its own unique sensory cellsâ€"such as rods and cones in the retina to detect light for the sense of vision. Functionally, there are 6 major classes of receptors: mechanoreceptors, nociceptors, photoreceptors, chemoreceptors, osmoreceptors, and thermoreceptors. By: Tim Taylor. Last Updated: Nov 2, Now please check your email to confirm your subscription. There was an error submitting your subscription. Please try again. Email Address. All Rights Reserved. Innerbody Research does not provide medical advice, diagnosis, or treatment. You must consult your own medical professional. The nervous system of the abdomen, lower back, and pelvis contains many important nerve conduits that service this region of the body as well as the lower limbs. This section of the nervous system features the most inferior portion of the spinal cord along with many major nerves, plexuses, and ganglia that serve the vital organs of the abdominopelvic cavity. As the spinal cord descends through the vertebral canal of the lower back, it tapers to a point known as the conus medullaris around the L2 vertebra. Upon exiting the vertebral canal, the spinal nerves of the lower back form into two networks known as the lumbar and sacral plexuses. The lumbar plexus supplies nerves to the skin and muscles of the lateral abdominal region, thigh, anterior thigh, and external genitals. The sacral plexus similarly supplies nerves to the skin and muscles of the posterior thigh, leg, and foot. The sciatic nerve, the largest and longest nerve in the human body, carries a major portion of the nerve signals from the sacral plexus into the leg before separating into many smaller branches. The spinal nerves of the lower back also carry many neurons of the autonomic nervous system ANS that maintain the vital involuntary processes of the digestive, urinary, endocrine, and reproductive systems. Neurons from the sympathetic division of the ANS extend from the spinal cord to form nerves that meet at several autonomic ganglia in the abdomen. Each autonomic ganglion, such as the celiac ganglion, forms a plexus of nerve fibers that extend to the organs of the abdomen and pelvis to control their function. The parasympathetic division of the ANS is also represented in the abdomen and pelvis through the vagus nerve and the sacral nerves. The vagus nerve is a cranial nerve that wanders from the base of the brain parallel to the spinal cord to stimulate digestion in the liver, stomach, and intestines. Parasympathetic neurons in the spinal cord pass through the sacral nerves in the lower back to reach the pelvic organs such as the bladder and reproductive organs to control their functions. Between the opposing functions of the sympathetic and parasympathetic divisions of the ANS, the nervous system is effectively able to control all of the organs of the abdomen and pelvis. A frequently overlooked portion of the nervous system is the enteric nervous system ENS found in the gastrointestinal tract. The ENS is a network of around million neurons that regulate the functions of the digestive tract. The ENS monitors the contents of the gastrointestinal tract; decides how to digest its contents most effectively; and controls the movements of smooth muscles and the secretion of glands that results in the digestion of food to provide nutrients to the body. Although the brain is able to monitor and control the ENS through autonomic neurons, the ENS often works autonomously and can even function after its nervous connections to the brain have been destroyed. By: Tim Taylor. Last Updated: Jul 30, Now please check your email to confirm your subscription. There was an error submitting your subscription. Please try again. Email Address. All Rights Reserved. Innerbody Research does not provide medical advice, diagnosis, or treatment. You must consult your own medical professional. Your cranial nerves are pairs of nerves that connect your brain to different parts of your head, neck, and trunk. There are 12 of them, each named for their function or structure. This is based off their location from front to back. Their functions are usually categorized as being either sensory or motor. Sensory nerves are involved with your senses, such as smell, hearing, and touch. Motor nerves control the movement and function of muscles or glands. The olfactory nerve transmits sensory information to your brain regarding smells that you encounter. When you inhale aromatic molecules, they dissolve in a moist lining at the roof of your nasal cavity, called the olfactory epithelium. This stimulates receptors that generate nerve impulses that move to your olfactory bulb. Your olfactory bulb is an oval-shaped structure that contains specialized groups of nerve cells. From the olfactory bulb, nerves pass into your olfactory tract, which is located below the frontal lobe of your brain. Nerve signals are then sent to areas of your brain concerned with memory and recognition of smells. The optic nerve is the

sensory nerve that involves vision. When light enters your eye, it comes into contact with special receptors in your retina called rods and cones. Rods are found in large numbers and are highly sensitive to light. Cones are present in smaller numbers. They have a lower light sensitivity than rods and are more involved with color vision. The information received by your rods and cones is transmitted from your retina to your optic nerve. Once inside your skull, both of your optic nerves meet to form something called the optic chiasm. At the optic chiasm, nerve fibers from half of each retina form two separate optic tracts. Through each optic tract, the nerve impulses eventually reach your visual cortex, which then processes the information. Your visual cortex is located in the back part of your brain. The oculomotor nerve has two different motor functions: muscle function and pupil response. This nerve originates in the front part of your midbrain, which is a part of your brainstem. It moves forward from that area until it reaches the area of your eye sockets. The trochlear nerve controls your superior oblique muscle. It emerges from the back part of your midbrain. Like your oculomotor nerve, it moves forward until it reaches your eye sockets, where it stimulates the superior oblique muscle. The trigeminal nerve is the largest of your cranial nerves and has both sensory and motor functions. The trigeminal nerve originates from a group of nuclei â€" which is a collection of nerve cells â€" in the midbrain and medulla regions of your brainstem. Eventually, these nuclei form a separate sensory root and motor root. The sensory root of your trigeminal nerve branches into the ophthalmic, maxillary, and mandibular divisions. The motor root of your trigeminal nerve passes below the sensory root and is only distributed into the mandibular division. This muscle is involved in outward eye movement. For example, you would use it to look to the side. This nerve, also called the abducent nerve, starts in the pons region of your brainstem. It eventually enters your eye socket, where it controls the lateral rectus muscle. The facial nerve provides both sensory and motor functions, including:. Your facial nerve has a very complex path. It originates in the pons area of your brainstem, where it has both a motor and sensory root. Eventually, the two nerves fuse together to form the facial nerve. Both within and outside of your skull, the facial nerve branches further into smaller nerve fibers that stimulate muscles and glands or provide sensory information. Your vestibulocochlear nerve has sensory functions involving hearing and balance. It consists of two parts, the cochlear portion and vestibular portion:. The cochlear and vestibular portions of your vestibulocochlear nerve originate in separate areas of the brain. The cochlear portion starts in an area of your brain called the inferior cerebellar peduncle. The vestibular portion begins in your pons and medulla. Both portions combine to form the vestibulocochlear nerve. The glossopharyngeal nerve has both motor and sensory functions, including:. The glossopharyngeal nerve originates in a part of your brainstem called the medulla oblongata. It eventually extends into your neck and throat region. The vagus nerve is a very diverse nerve. It has both sensory and motor functions, including:. Out of all of the cranial nerves, the vagus nerve has the longest pathway. It extends from your head all the way into your abdomen. It originates in the part of your brainstem called the medulla. Your accessory nerve is a motor nerve that controls the muscles in your neck. These muscles allow you to rotate, flex, and extend your neck and shoulders. The spinal portion originates in the upper part of your spinal cord. The cranial part starts in your medulla oblongata. These parts meet briefly before the spinal part of the nerve moves to supply the muscles of your neck while the cranial part follows the vagus nerve. Your hypoglossal nerve is the 12th cranial nerve which is responsible for the movement of most of the muscles in your tongue. It starts in the medulla oblongata and moves down into the jaw, where it reaches the tongue. Learn about its symptoms, diagnosis, and treatment. Have trouble blinking or closing your eyes to sleep? You might have lagophthalmos. Learn what causes this condition and how to treat it. Isolated nerve dysfunction IND is a type of neuropathy nerve damage that occurs in a single nerve. Technically it is a mononeuropathy because itâ€¦. The amygdaloid body is also known as the amygdaloid nucleus. This is an oval structure located within the temporal lobe of the human brain. In the brain, oxygenated blood travels through an extensive and central cerebral arterial circle. This network is called the circle of Willis. The anterior cerebral artery supplies most of the superior-medial parietal lobes and portions of the frontal lobes with fresh blood. Blood supply toâ€¦. The occipital bone is the trapezoidal-shaped bone found at the lower-back area of the cranium. The occipital is cupped like a saucer in order to houseâ€¦. The thalamus is located deep within the brain in the cerebral cortex, adjacent to the hypothalamus. It is a symmetrical structure, situated on top ofâ€¦. The superior colliculus refers to the rostral front bump on the lateral side part of the midbrain. It is, in fact, a pair of two colliculiâ€¦. The 12 Cranial Nerves. Medically reviewed by Deborah Weatherspoon, Ph. Olfactory nerve II. Optic nerve III. Oculomotor nerve IV. Trochlear nerve V. Trigeminal nerve VI. Abducens nerve VII. Facial nerve VIII. Vestibulocochlear nerve IX. Glossopharyngeal nerve X. Vagus nerve XI. Accessory nerve XII. Hypoglossal nerve Cranial nerve diagram What are cranial nerves? Keep

reading to learn more about each of the 12 cranial nerves and how they function. Olfactory nerve. Optic nerve. Oculomotor nerve. Trochlear nerve. Trigeminal nerve. Abducens nerve. Facial nerve. Vestibulocochlear nerve. Glossopharyngeal nerve. Vagus nerve. Accessory nerve. Hypoglossal nerve. Cranial nerve diagram. Read this next. Sixth Nerve Palsy. Medically reviewed by University of Illinois. Medically reviewed by Seunggu Han, M. Medically reviewed by Ann Marie Griff, O. Isolated Nerve Dysfunction. Medically reviewed by Alana Biggers, M. Amygdaloid body Medically reviewed by the Healthline Medical Network. Posterior communicating artery Medically reviewed by the Healthline Medical Network. Anterior cerebral artery Medically reviewed by the Healthline Medical Network. Thalamus Medically reviewed by the Healthline Medical Network. Superior colliculus Medically reviewed by the Healthline Medical Network. Neurons signal to other cells through fibers called axons. Chemicals called neurotransmitters are released at gaps called synapses. These communications take only a fraction of a millisecond. Sensory neurons respond to stimuli such as light and sound. Motor neurons carry activation signals to muscles and glands. Neurons are supported and fed by glial cells. The Central Nervous System is the integration and command center of the body. It consists of the brain, spinal cord and the retinas of the eyes. The Peripheral Nervous System consists of sensory neurons, ganglia clusters of neurons and nerves that connect the central nervous system to arms, hands, legs and feet. The Cranial Nervous System nerves connect the brain to the eyes, mouth, ears and other parts of the head. The Autonomic Nervous System nerves connect the central nervous system to the lungs, heart, stomach, intestines, bladder and sex organs. The branch of medicine that studies the nervous system is called neurology. Doctors who treat the nervous system are neurologists. Live Science. Please deactivate your ad blocker in order to see our subscription offer. The central system is the primary command center for the body, and is comprised of the brain and spinal cord. The peripheral nervous system consists of a network of nerves that connects the rest of the body to the CNS. The two systems work together to collect information from inside the body and from the environment outside it. The systems process the collected information and then dispatch instructions to the rest of the body, facilitating an appropriate response. In most cases, the brain is the final destination point for information gathered by the rest of the nervous system. Once data arrives, the brain sorts and files it before sending out any necessary commands. The brain is divided into many different sections, including the cerebrum and brain stem. Although the brain is the control center, its job would not be possible without the spinal cord, which is the major conduit for information traveling between brain and body. Peripheral system nerves branch from either the brain stem or the spinal cord. Each nerve is connected to a particular area of the torso or limbs and is responsible for communication to and from those regions. The PNS can also be subdivided into smaller components: the somatic and autonomic systems. The somatic involves parts of the body a person can command at will, and the autonomic helps run involuntary functions such as pumping blood. Information conveyed through the nervous system moves along networks of cells called neurons. These neurons can only send information one way. Those transmitting to the brain are sensory neurons; those that transmit from the brain are known as motor neurons. The nervous system can suffer from a number of afflictions, including cancer e. Other problems include multiple sclerosis, in which damaged nerves prevent signals from traveling along them, and meningitis, which causes an inflammation of the membranes surrounding the brain and spinal cord. It is the only cranial nerve that emerges dorsally from the brain near the back â€¦. The tibial nerve branches off from the sciatic nerve. It provides innervation to the muscles of the lower leg and foot. The tibial nerve generallyâ€¦. The maxillary nerve is a nerve located within the mid-facial region of on the human body. The nerve follows a pathway from the cavernous sinus aâ€¦. The oculomotor nerve is the third of 12 pairs of cranial nerves in the brain. This nerve is responsible for eyeball and eyelid movement. It followsâ€¦. The lateral femoral cutaneous nerve is a branch of the lumbar plexus, exiting the spinal cord between the L2 and L3 vertebrae. The frontal nerve is the largest branch of the ophthalmic division of the fifth cranial nerve. The ophthalmic nerve is responsible for conveyingâ€¦. The medial cutaneous nerve is located in the arm. It spreads through the middle of the arm, also known as the medial brachial area. It is also calledâ€¦. The cervical nerves consist of eight paired nerves that are a part of the peripheral nervous system. They emerge from the spinal cord through theâ€¦. The ulnar nerve is a nerve that travels from the wrist to the shoulder. This nerve is mainly responsible for movement of the hand; despite passingâ€¦. Combined with the cardiovascular system, the circulatory system helps to fight off disease, helps the body maintain a normal body temperature, andâ€¦. Read this next. Trochlear nerve Medically reviewed by the Healthline Medical Network. Tibial nerve Medically reviewed by the Healthline Medical Network. Maxillary nerve Medically reviewed by the Healthline Medical Network. Oculomotor nerve Medically reviewed by the Healthline Medical Network. Lateral

femoral cutaneous nerve Medically reviewed by the Healthline Medical Network. Frontal nerve Medically reviewed by the Healthline Medical Network. Medial cutaneous nerve Medically reviewed by the Healthline Medical Network. Cervical nerves Medically reviewed by the Healthline Medical Network. Ulnar nerve Medically reviewed by the Healthline Medical Network. Circulatory Medically reviewed by the Healthline Medical Network. Two spinal nerves branch off from the right and left sides of the spinal cord or the cauda equina at each spinal segment. These spinal nerves are formed by 2 types of fibersâ€"sensory fibers that send messages to the brain feeling pain when the leg is hurt and motor fibers that receive messages from the brain lifting the leg to get out of a car. Watch Now. There are 5 pairs of lumbar spinal nerves that progressively increase in size from L1 to L5. These nerves exit the intervertebral foramina below the corresponding vertebra. For example, the L4 nerve exits beneath the L4 vertebra through the L4-L5 foramen. These nerves course down from the lower back and merge with other nerves to form the lumbar and lumbosacral plexuses a network of nerves , which innervate the lower limbs. Doctors may sometimes refer to the part of the spinal nerve exiting the intervertebral foramen as the nerve root or use the terms nerve root and spinal nerve interchangeably. The 5 pairs of lumbar spinal nerves innervate the lower limbs. While innervation can vary among individuals, some common patterns include 2 :. The L4 and L5 nerves along with other sacral nerves contribute to the formation of the large sciatic nerve that runs down from the rear pelvis into the back of the leg and terminates in the foot. Symptoms and signs arising from these nerves, typically referred to as sciatica , can cause a sharp, burning pain radiating down the leg with associated weakness and numbness. See Sciatic Nerve and Sciatica. While the lumbar spinal nerves progressively increase in size, the openings for these nerves intervertebral foramina decrease in size from L1 to L5. See Causes of Lower Back Pain. Spinal Cord and Spinal Nerve Roots. Sciatic Nerve Anatomy Video. Sciatica Causes and Symptoms Video. Causes of Lower Back Pain. You are here Conditions Spine Anatomy. By Kara Beasley, DO, Peer Reviewed. Waxenbaum JA, Futterman B. Anatomy, Back, Lumbar Vertebrae. In: StatPearls [Internet]. Disc Herniation. Editor's Top Picks. Health Information Sponsored. They remind me of school textbooks which used to have plenty of them, providing a visual aid to understanding difficult subjects. This article explains the nervous system function and structure with the help of a human nervous system diagram and gives you that erstwhile 'textbook feel'. Read on. Studying human anatomy became interesting, thanks to her. It was wonderful to pick up the intricacies of a seemingly boring subject like human anatomy from her. Reading this article will be like reading about the human nervous system from your science textbook as this article carries a labeled human nervous system diagram to help you understand its design and working. For me, diagrams and illustrations that textbooks carried, were always of great help in understanding the topic. And it was when I first studied the diagram of a human heart, I realized that the heart is not exactly heart-shaped! Would you like to write for us? Well, we're looking for good writers who want to spread the word. Get in touch with us and we'll talk Coming back to the point, let me start explaining the human nervous system function and parts with the help of a labeled diagram. Before going to the details of the structure and functioning of the human nervous system, you should know what the nervous system actually is and what it does. The nervous system is a network of special cells, neurons and ganglia, that work together to carry out the transmission and reception of signals between different parts of our body. The signals are transmitted in the form of electrochemical waves or chemicals. Before you proceed to understand the human nervous system function and parts, you might like to go through some human nervous system facts. So here are some interesting facts about the nervous system. Neuron can be considered as the basic unit of the nervous system, which processes and transmits information by means of electrochemical signals. Sensory neurons respond to external stimuli that affect the sensory organ cells. Motor neurons, on receiving signals from the central nervous system, bring about responses at the target organs. Interneurons act as the connectors between neurons. Neurons are of different shapes and sizes and their complex interconnections add to the complexity of the nervous system. The human brain contains The glial cells surround the neurons to hold them in place, supply them with oxygen and nutrients, isolate the neurons from one another and remove dead neurons. The human brain contains about The human nervous system can be divided into two parts, central and peripheral. The central nervous system CNS consists of the brain and the spinal cord, while the peripheral nervous system PNS consists of sensory neurons, ganglia clusters of neurons and nerves. Here is a diagram that you can refer to, while you read about the human nervous system function and parts. The central nervous system coordinates the functioning of all parts of the human body and is the largest part of the nervous system. It is enveloped by a set of membranes known as meninges that protect the brain and the spinal cord. They also have their own protective covers! The skull protects the brain while the vertebrae and spinal cavity shield the delicate spinal cord.

To be precise, the brain is placed in the cranial cavity and the spinal cord in the spinal cavity. The brain is the center of the human nervous system and is a highly complex organ. The human brain is about three times larger than the brain of a typical mammal. The brain can be said to have three main parts, the brain stem, the cerebrum and the cerebellum. The cerebrum is associated with information storage and processing; the cerebellum is responsible for balance, posture and coordination of movements; and the brain stem plays a vital role in controlling breathing and heart rate along with some other important body processes. Along with the skull, the brain is also protected by the cerebrospinal fluid in which it is suspended. For a detailed study of brain anatomy and its functions, read: diagram of the brain and its functions. The spinal cord is a long tubular structure composed of nervous tissue and support cells. It is around 45 cm long in men and 43 cm long in women. It extends from the brain up to the space between the first and the second lumbar vertebrae. It transmits neural signals between the brain and other body parts. It is the spinal cord which connects the brain and the peripheral nervous system. It consists of about 13,, neurons. How does the central nervous system communicate with the other body organs? It is through the peripheral nervous system. Functionally, the peripheral nervous system can be divided into two parts; the somatic nervous system and the autonomic nervous system. the somatic nervous system is responsible for bodily activities that are under conscious control. For example, controlling body movements and receiving external stimuli. The autonomic nervous system is further divided into sympathetic, parasympathetic and enteric nervous systems. The sympathetic nervous system governs the bodily responses to impending dangers, while the parasympathetic system is responsible for bodily actions that help in relaxation of body organs that are hyperactive. The enteric nervous system specifically manages the functioning of the digestive system. Cable-like in appearance, the nerves serve as paths for the transmission of nerve impulses along axons. Nerves are found only in the peripheral nervous system. Depending on the direction of the signals they conduct, they are classified into afferent and efferent nerves. The afferent ones conduct signals from sensory neurons to the central nervous system, while the efferent ones conduct signals from the central nervous system along motor neurons to muscles or glands. There are some nerves which can function like both afferent and efferent ones. They are called mixed nerves. Musculocutaneous Nerve It is a part of the brachial plexus. It runs through the neck, the armpit area and ends in the arm. It serves the bicep muscles and the skin of the forearm. Radial Nerve It is also a part of the brachial plexus. It supplies the triceps brachii muscle of the arm and a part of the forearm along with its associated joints and skin. Median Nerve It is one of the main nerves that originate from the brachial plexus. It runs down the arm and enters the forearm. The median nerve is the only nerve passing through the carpal tunnel. Iliohypogastric Nerve It originates from the first lumbar nerve and supplies the abdominal muscles along with skin of some parts of the abdominal wall. Obturator Nerve It is a mixed nerve that arises from the lumbar plexus. It supplies the adductor, gracilis and obturator externus muscles. It also supplies a part of the skin of the thigh, hip and knee joints. Genitofemoral Nerve It arises in the lumbar plexus and bifurcates into two branches, namely, genital and femoral. Its branches run through the skin of the scrotum and to the upper anterior aspect of the thigh. Ulnar Nerve It runs near the ulna bone and is directly connected to the little finger and half of the ring finger. It supplies the tips of these fingers and the far back of the fingernail beds. It is the largest nerve which is unprotected by muscle or bone. Common Peroneal Nerve Also known as the common fibular nerve, it is half the size of the tibial nerve and originates from the branches of the lumbar and sacral nerves. It runs obliquely along the side of the depression at the back of the knee joint to the head of the calf bone. Deep Peroneal Nerve Also known as the deep fibular nerve, it originates at the bifurcation of the common peroneal nerve, comes above the middle of the leg and then to the front of the ankle joint. The deep peroneal nerve supplies muscular branches to some parts of the leg and the ankle joint. Superficial Peroneal Nerve It supplies the peroneus longus, a muscle in the lateral compartment of the leg and the peroneus brevis, a smaller muscle lying under the peroneus longus. This nerve supplies musclular branches to the longus and the brevis muscles and cutaneous filaments to the skin of the lower part of the leg. Tibial Nerve The tibial nerve is a branch of the sciatic nerve. It passes through the depression at the back of the knee joint, where it gives off an articular branch to the knee joint and a cutaneous branch that becomes the sural nerve. Saphenous Nerve It is the largest cutaneous branch of the femoral nerve. It supplies cutaneous branches to the skin of the leg and foot in the region between the knee and the ankle. Sciatic Nerve Also known as the ischiatic nerve, the sciatic nerve is a nerve fiber that begins in the lower back and ends in the lower limb. It supplies the skin of the leg and the muscles of the leg, foot and back of the thigh. Pudental Nerve Originating in the sacral region of the spinal cord, it is formed from the second, third and fourth sacral nerves. It is located in the pelvic region and it supplies the external genitalia of both men and women. Femoral Nerve It is

located inside the leg and supplies muscles that help in bending and straightening the leg. It is the largest branch of the lumbar plexus. Subcostal Nerve It is the vertical branch of the 12th thoracic nerve and supplies some parts of the abdominal muscles. It supplies branches to the skin of the lower abdominal wall and the gluteal region. It passes along the border of the 12th rib. Intercostal Nerves The ventral branches of the thoracic nerves are known as intercostal nerves. The first two intercostal nerves supply fibers to the upper limb, the next four, to the thorax and the lower five to the thorax and abdomen. The literal meaning of plexus is network. In human beings, rather all vertebrates, the area where nerves branch and rejoin, is known as a plexus. The four main nerve plexuses in the human body are cervical plexus, brachial plexus, lumbar plexus and sacral plexus. Here is a brief description of each of them. Cervical Plexus The anterior branches of the upper four cervical nerves form a plexus in the neck region, and it is known as the cervical plexus. The nerves of the cervical plexus supply the back of the head, the neck and the shoulders. Brachial Plexus The arrangement of nerve fibers formed by the ventral rami of the lower cervical and upper thoracic nerve root, precisely between the nerve roots of the 5th cervical and 1st thoracic vertebra, is known as the brachial plexus. It runs through the neck, the armpit region and then into the arm. Sacral Plexus This plexus supplies nerves to the posterior thigh, lower leg, foot and a part of the pelvis. It is formed by the 4th and 5th lumbar nerves and the 1st, 2nd and 3rd sacral nerves. Nerves of the sacral plexus join to form a flattened band, which later forms the sciatic nerve. Lumbar Plexus Formed by the ventral divisions of the first four lumbar nerves, the lumbar plexus is located in the lumbar region of the body. It passes through psoas major, where it supplies some smaller motor branches. Some of its larger branches run through the pelvic area. This was an overview of the human nervous system function and structure along with a labeled diagram. Here is something that will add to that feeling; a human nervous system diagram to label. Download the image right click and save and try labeling all the nervous system parts that you just studied. Before you begin, you can take a quick peek at the already labeled diagram given above and see if you get the labels right! I will conclude the article with what my teacher had said after she finished her lessons on human nervous system. Studying human anatomy is in fact, understanding the most complex and intelligently crafted machines. And understanding complexities can never be simple. But making the complex appear simple is what only God can do. Necessary cookies are absolutely essential for the website to function properly. This category only includes cookies that ensures basic functionalities and security features of the website. These cookies do not store any personal information. Any cookies that may not be particularly necessary for the website to function and is used specifically to collect user personal data via analytics, ads, other embedded contents are termed as non-necessary cookies. It is mandatory to procure user consent prior to running these cookies on your website. Let's Work Together! Get Updates Right to Your Inbox Sign up to receive the latest and greatest articles from our site automatically each week give or take if you are human, leave this field blank. Kidneys Vital Role April 27, This website uses cookies to improve your experience. We'll assume you're ok with this, but you can opt-out if you wish. Cookie settings Accept. Close Privacy Overview This website uses cookies to improve your experience while you navigate through the website. Out of these cookies, the cookies that are categorized as necessary are stored on your browser as they are essential for the working of basic functionalities of the website. We also use third-party cookies that help us analyze and understand how you use this website. These cookies will be stored in your browser only with your consent. You also have the option to opt-out of these cookies. But opting out of some of these cookies may have an effect on your browsing experience. Necessary Necessary. Non-necessary Non-necessary. The spinal cord is nestled in a cavity called the vertebral foramen inside of the vertebrae. Many nerves of the peripheral nervous system, which transport signals to and from specific parts of the body, meet the spinal cord at the vertebral column. The typical adult has 33 total vertebrae, although it can range from 32 to 34 due to individual variance. Most vertebrae are identified by a letter-number combination based on where they are in the spine. The atlas is also known as C1 because it is the first cervical vertebra; T11 is the 11th thoracic vertebra. There are seven cervical vertebrae at the top, followed by 11 thoracic vertebrae, five lumbar vertebrae at the lower back, and five fused vertebrae at the bottom to create the sacrum. The coccyx, or tailbone, is the lowest bone of the spinal column. Many of the peripheral nerves are named after the part of the spine where they join the spinal cord. There are cervical, thoracic, and lumbar nerves. It is the only cranial nerve that emerges dorsally from the brain near the back â€¦. The tibial nerve branches off from the sciatic nerve. It provides innervation to the muscles of the lower leg and foot. The tibial nerve generallyâ€¦. The maxillary nerve is a nerve located within the mid-facial region of on the human body. The nerve follows a pathway from the cavernous sinus aâ€¦. The oculomotor nerve is the third of 12 pairs of cranial nerves in the brain. This nerve is responsible for eyeball and eyelid

movement. It follows…. The lateral femoral cutaneous nerve is a branch of the lumbar plexus, exiting the spinal cord between the L2 and L3 vertebrae. The frontal nerve is the largest branch of the ophthalmic division of the fifth cranial nerve. The ophthalmic nerve is responsible for conveying…. The medial cutaneous nerve is located in the arm. It spreads through the middle of the arm, also known as the medial brachial area. It is also called…. The cervical nerves consist of eight paired nerves that are a part of the peripheral nervous system. They emerge from the spinal cord through the…. The ulnar nerve is a nerve t

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 hat travels from the wrist to the shoulder. This nerve is mainly responsible for movement of the hand; despite passing…. Combined with the cardiovascular system, the circulatory system helps to fight off disease, helps the body maintain a normal body temperature, and…. Read this next. Trochlear nerve Medically reviewed by the Healthline Medical Network. Tibial nerve Medically reviewed by the Healthline Medical Network. Maxillary nerve Medically reviewed by the Healthline Medical Network. Oculomotor nerve Medically reviewed by the Healthline Medical Network. Lateral femoral cutaneous nerve Medically reviewed by the Healthline Medical Network. Frontal nerve Medically reviewed by the Healthline Medical Network. Medial cutaneous nerve Medically reviewed by the Healthline Medical Network. Cervical nerves Medically reviewed by the Healthline Medical Network. Ulnar nerve Medically reviewed by the Healthline Medical Network. Circulatory Medically reviewed by the Healthline Medical Network.