

HUMAN ANATOMY AND PHYSIOLOGY-I, BP-101(T)

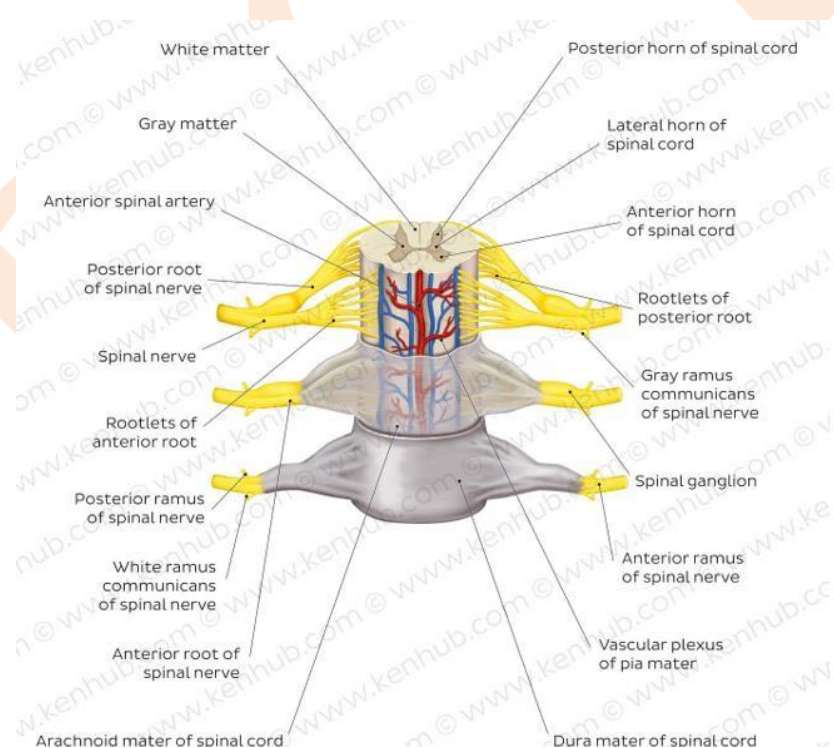
UNIT-IV (Peripheral nervous system:)

CLASS:6

TOPIC – Peripheral nervous system: Classification of peripheral nervous system

Spinal nerves

The second set of peripheral nerves are spinal nerves, of which there are 31 pairs: eight cervical, twelve thoracic, five lumbar, five sacral, and one coccygeal. Their numbering relates to the vertebral column exit level; cervical spinal nerves are numbered according to the vertebra located below, while all the rest according to the vertebra situated above.



Spinal membranes and nerve roots

Each spinal nerve starts as several rootlets that unite to form two main roots. The anterior root carries motor fibers from neurons whose cell bodies are located in the anterior horn of the spinal

cord. The posterior root transports sensory fibers from neurons which have their cell bodies in the dorsal root ganglion. In the thoracic and upper lumbar region, the anterior root also carries autonomic fibers from preganglionic sympathetic neurons whose cell bodies are located in the spinal cord's lateral horn. The anterior and posterior roots subsequently join to form the spinal nerve proper that carries mixed (sensory, motor, autonomic) fibers.

Spinal nerves leave the vertebral column through the intervertebral foramina located between two successive, adjacent vertebrae. Each spinal nerve then divides into two branches called posterior/dorsal and anterior/ventral rami. Both rami carry mixed fibers. The posterior rami travel backward and divide into branches that supply post-vertebral structures. The anterior rami supply the skin and muscles of the limbs and anterior trunk.

Immediately after the division of the spinal nerve into the two rami, smaller communicating fibers branch out. These white and grey rami communicantes establish a connection between spinal nerves and the two sympathetic trunks of the autonomic nervous system that run along the length of the vertebral column. Note that grey rami communicantes exist at all levels of the spinal cord, whilst white rami are only found at T1-L2 levels.

Somatic nervous system

The somatic, voluntary, nervous system is responsible for providing sensory and motor innervation to skin, muscles and sensory organs. In other words, it carries sensations from the body (pain, touch, temperature, proprioception) and innervates skeletal muscles that are under conscious, or voluntary control. In addition, the somatic nervous system is involved in spinal reflexes, an example being the withdrawal reflex. This helps you to instantly pull away your hand when touching a hot object.

Both cranial and spinal nerves contribute to the somatic nervous system. Cranial nerves provide voluntary motor control and sensation to the head and face. Spinal nerves, as we mentioned previously, supply the trunk and limbs. The posterior rami travel backwards to supply the vertebral column, vertebral muscles and skin of the back whilst the anterior rami supply the limbs and anterior trunk. The majority of anterior rami combine to form nerve plexuses from which many major peripheral nerves stem. The exception to this is the anterior rami of the thoracic region which travel

relatively independently from one another without forming plexuses, as the intercostal and subcostal nerves of the trunk.

Peripheral nerves of the nervous plexuses	
Cervical plexus	Lesser occipital nerve Great auricular nerve <u>Transverse cervical nerve</u> Supraclavicular nerves Phrenic nerve Ansa cervicalis Other smaller branches, for instance the nerves to the <u>rhomboids</u> and <u>serratus anterior muscles</u>
Brachial plexus	<u>Axillary nerve</u> <u>Musculocutaneous nerve</u> <u>Radial nerve</u> <u>Median nerve</u> <u>Ulnar nerve</u> Other smaller branches such as; dorsal scapular, long thoracic, suprascapular nerve, nerve to <u>subclavius</u> , lateral & medial pectoral, medial cutaneous of arm & <u>forearm</u> , superior & inferior subscapular, thoracodorsal
Lumbar plexus	<u>Iliohypogastric nerve</u> <u>Ilioinguinal nerve</u> Genitofemoral nerve Lateral cutaneous nerve of the thigh <u>Femoral nerve</u> Obturator nerve
Sacral plexus	<u>Superior gluteal nerve</u> <u>Inferior gluteal nerve</u> <u>Sciatic nerve</u> (<u>common fibular</u> and <u>tibial</u> divisions) Posterior cutaneous nerve of the thigh (perforating cutaneous) Pudendal nerve

Other smaller branches such as; nerve to piriformis,
nerve to quadratus femoris and inferior gemellus,
nerve to obturator internus

IMPORTANT QUESTIONS:

2M QUESTIONS:

- 1) Differentiate sympathetic and parasympathetic nervous system.
- 2) Differentiate spinal nerves and cranial nerves.
- 3) What is Astigmatism.

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5M QUESTIONS:

- 1) Different between sympathetic and parasympathetic nervous system.
- 2) Write a note sympathetic and parasympathetic nervous system.
- 3) Explain cranial nerves along with their functions.
- 4) Explain spinal nerves along with their functions.

10 M QUESTIONS:

- 1) Different between sympathetic and parasympathetic nervous system.
- 2) Write a note sympathetic and parasympathetic nervous system.
- 3) Explain cranial nerves along with their functions.
- 4) Explain spinal nerves along with their functions.