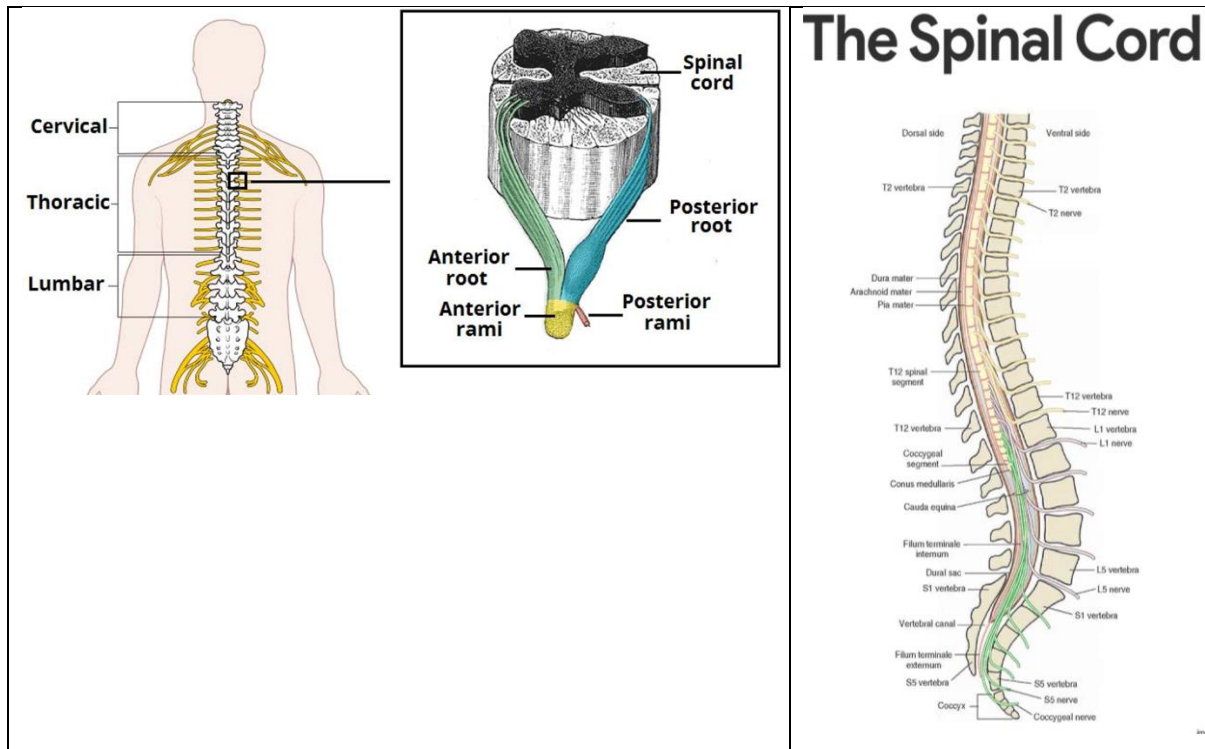


Structure Of Spinal Cord

The Spinal cord runs through a hollow case from the skull enclosed within the vertebral column. Spinal nerves arise from different regions of the vertebral column and are named accordingly, the regions are – Neck, chest, pelvic and abdominal.

- **Length.** The spinal cord is approximately **17 inches (45 MALE FEMALE 43 CM cm)** long.
- **Major function.** The spinal cord provides a two-way conduction pathway to and from the brain, and it is a major reflex center (spinal reflexes are completed at this level).
- Cross-section of spinal cord displays grey matter shaped like a butterfly surrounded by a white matter.
- **Location.** Enclosed within the vertebral column, the spinal cord extends from the foramen magnum of the skull to the first or second lumbar vertebra, where it ends just below the ribs.
- **Meninges.** Like the brain, the spinal cord is cushioned and protected by the meninges; meningeal coverings do not end at the second lumbar vertebra but instead extend well beyond the end of the spinal cord in the vertebral canal.



Grey matter consists of the central canal at the centre and is filled with a fluid called CSF (Cerebrospinal fluid). It consists of horns (four projections) and forms the core mainly containing neurons and cells of the CNS. There are two dorsal and two ventral horns.

The white matter consists of a collection of axons permitting communication between different layers of CNS. A tract is a collection of axons and carries specialized information. Ascending tracts and descending tracts send and transmit signals from the brain respectively to various nerve cells across the body.

Spinal nerves act as mediators, communicating information to and from the rest of the body and the spinal cord. We have 31 pairs of spinal nerves.

Three layers of meninges surround the spinal cord and spinal nerve roots.

- Dura mater
- Arachnoid mater
- Pia mater

Dura mater consists of two layers- periosteal and meningeal. Epidural space is present between the two layers.

Subarachnoid space lies between the arachnoid mater and pia mater. It is filled with cerebrospinal fluid.

Spinal Cord Nerves

The spinal nerves consist of a group of 31 nerves. These nerves are attached to the spinal cord by two roots- dorsal sensory root and ventral motor root.

The sensory root fibres carry sensory impulses to the spinal cord. The motor roots, on the contrary, carry impulses from the spinal cord.

The spinal nerves carry messages to and from the skin of specific regions of the body called dermatomes.

The spinal cord nerves can be grouped as:

- Cervical
- Thoracic
- Sacral
- Lumbar
- Coccygeal

Cervical Nerves

Cervical means of the neck. There are 8 cervical nerves that emerge from the cervical spine (C1-C8).

Thoracic Nerves

Thoracic means of the chest. There are 12 thoracic nerves that emerge from the thoracic spine (T1-T12).

Lumbar Nerves

Lumbar means from the lower back region. There are 5 lumbar nerves that emerge from the lumbar spine (L1-L5).

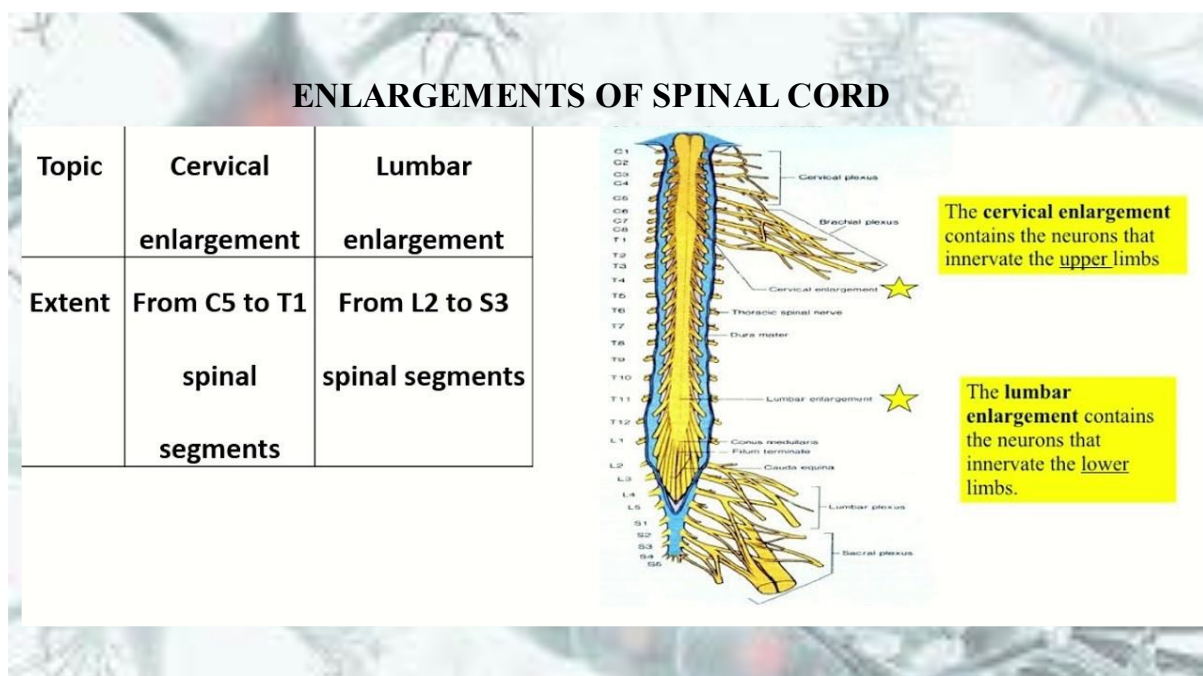
Sacral Nerves

Sacral means of the sacrum. The sacrum is a bony plate at the base of the vertebral column.

There are 5 sacral nerves that emerge from the sacral bone (S1-S5).

Coccygeal Nerves

Coccygeal means of the tailbone. There is 1 nerve that emerges from the coccygeal bone.



Function Of Spinal Cord

Important functions of Spinal Cord are mentioned below:


- Forms a connecting link between the brain and the PNS
- Provides structural support and builds a body posture
- Facilitates flexible movements
- Myelin present in the white matter acts as an electrical insulation
- Communicates messages from the brain to different parts of the body
- Coordinates reflexes
- Receives sensory information from receptors and approaches towards the brain for processing.

Spinal Nerve

- 31 pairs
- Spinal nerve follows the name of corresponding vertebra column.
- Consists cervical spinal nerve, thoracic spinal nerve, lumbar spinal nerve, sacral spinal nerve and coccyx spinal nerve.
- Emerge from spinal cord and through the intervertebral foramina of vertebra.

Spinal Nerve

- Spinal nerves:
 1. 8 pairs of cervical spinal nerves
 2. 12 pairs of thoracic spinal nerves
 3. 5 pairs of lumbar spinal nerves.
 4. 5 pairs of sacral spinal nerves
 5. 1 pairs of coccyx spinal nerves.



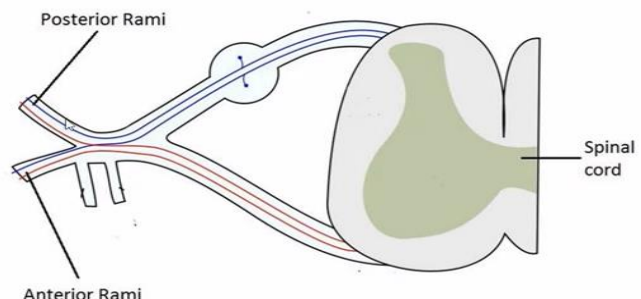
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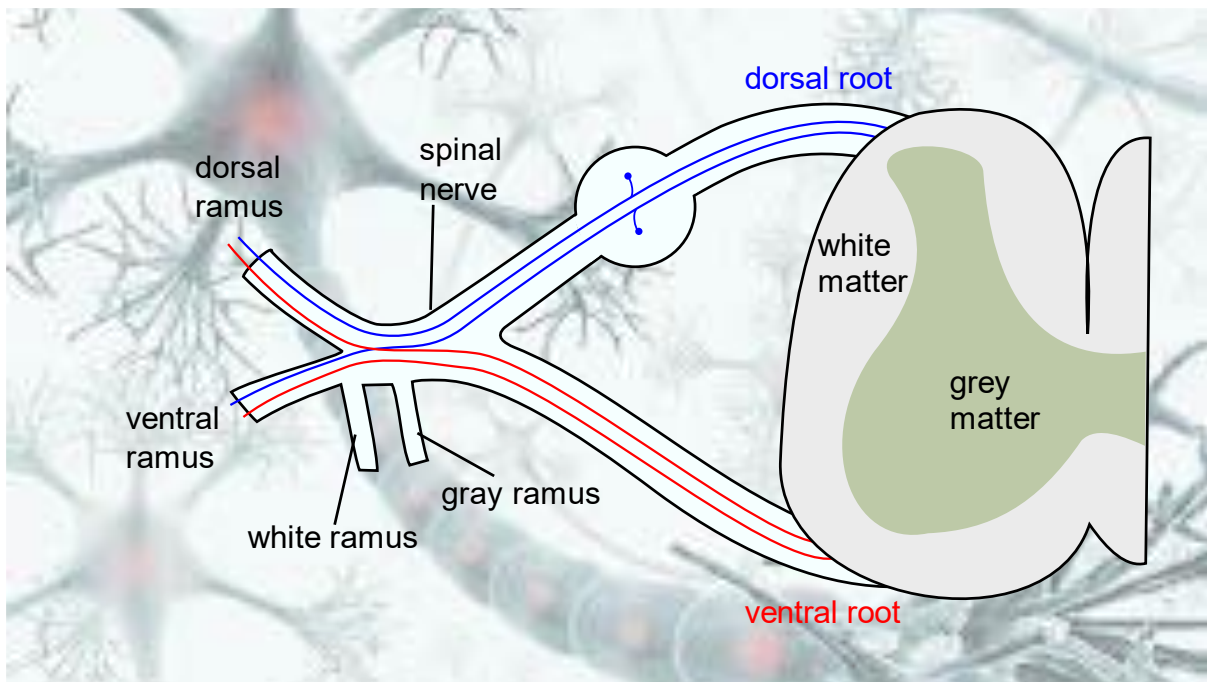
Branches of spinal nerves

- Immediately after leaving the intervertebral foramen, spinal nerves divide into two branches or rami-

1. Anterior/ventral ramus- supply the anterior and lateral aspects of skin, muscles, neck, trunk and the upper and lower limb.

2. Posterior/dorsal ramus- supply skin and muscles of the posterior aspects of head, neck and trunk.





Nerve roots

- Each spinal nerve is formed by the union of a motor (anterior, ventral, efferent) and a sensory (posterior, dorsal, afferent) nerve root, therefore it is a mixed nerve.
- Just outside the spinal cord, posterior nerve root consists of spinal ganglion (posterior, dorsal root ganglion), which is a little clusters of cell bodies.

