

.In the cervical, lumbar and sacral regions the anterior rami unite near their origins to form large masses of nerve, or plexuses, where nerve fibers are regrouped and rearranged before proceeding to supply skin bones, muscles and joints of a particular area (figure 12. 16).The lumbar, sacral and coccygeal nerves leave the spinal cord near its termination at the level of the first lumbar vertebra, and descend downward inside the vertebral canal forming a structure called cauda equina (horse's tail).A ventral (anterior) and a dorsal (posterior) root unit to form a spinal nerve, which extends outward from the vertebral canal through an intervertebral foramina (figure 12. 15, 16).

The Nervous System The cervical vertebrae are seven and the cervical spinal nerves are 8 pairs because the first pair leave the vertebral canal between the occipital bone and the atlas and the eight pair leave the vertebral canal between the last cervical and the first thoracic vertebra. This ganglion contains the cell bodies of the sensory neurons whose dendrites conduct impulses inward from the peripheral body parts. The ventral root (anterior or motor root) of each spinal nerve consists of axons from the motor neurons whose cell bodies are located in the anterior column of grey matter in the spinal cord. Immediately after emerging from the intervertebral foramen each spinal nerve divides into a ramus communicans, a posterior ramus and an anterior ramus.

Dura mater LI L1– Cauda equina L2 L2 Lumbar Lumbar L3 L3 vertebrae nerves L4 L4 L5 Sacrum of ??????The posterior rami pass backwards and divide into medial and lateral branches to supply skin and muscles of the posterior aspect head, neck and trunk. The dorsal root (posterior or sensory root) can be identified by an enlargement called the dorsal (posterior) root ganglion (Spinal ganglion) (figure 12. 15).

Nerve roots Each spinal nerve emerge from the cord by two short branches, or roots, which lie within the vertebral canal. The rami communicans are part of the preganglionic sympathetic neurons of the autonomic nervous system. This means that these structures have a nerve supply from more than one spinal nerve

296 **Filum terminale** S11 s2 S3 Sacral nerves S4 S5 Coccygeal nerve

Figure 12. 16 Spinal nerves. Each of 31 pairs of spinal nerves exits the spinal cavity from the intervertebral foramina. In the thoracic region the anterior rami do not form plexuses. The anterior rami supply the anterior and lateral aspects of the neck, trunk and the upper and lower limb. Note that after leaving the spinal cavity, many of the spinal nerves interconnect to form networks called plexuses.

Cervical vertebrae Cervical plexus Cervical nerves C8 T3 T4 T4 T5 T5 Thoracic T6 T6 Thoracic vertebrae T7 T7 nerves T8 T8 T9 T9 T10 T10 T11– T11 LT12– T12. Thereafter the spinal nerves are given the name and number of the vertebra immediately above. The adult spinal cord ends at the lower border of the first lumbar vertebra (between the first and second lumbar vertebra).

The Nervous System and therefore damage to one spinal nerve does not cause loss of functions of a region. The names of the vertebrae are given on the left and the names of the corresponding spinal nerves on the right.