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Anatomy: Back Essay
The vertebral column is part of the axial skeleton, supporting the appendages and body mass superior to the pelvis. It is intricately and specifically designed to provide a rigid framework for the body as well as excessive mobility in all planes of movement. Amidst this incredibly strong and flexible framework, which is constantly in motion and under stress, sits the unscathed, fragile reflex unit and connector of the body to the brain. The vulnerable spinal cord continues to support and monitor the body’s extensive functions while it is protected and cushioned by the structure of the spinal column.

The spinal cord is a continuation of the medulla oblongata and travels inferiorly down the vertebral canal with a cervical enlargement, lumbosacral enlargement and finally tapers into the cauda equina. Contained in the vertebral canal is not only the spinal cord, but meninges, fat, nerve roots, and neurovascular vessels. The structure which makes up the vertebral canal provides consistent protection and continuous access to all surrounding tissue. Pedicles and laminae form the protective vertebral arches and are made of firm corticol bone. The segmented structure of the deep intrinsic back muscles and vertebrae, along with the flexible meninges, enable stability and motion. These important functions are in conjunction with continuous access outside of the vertebral column. The IV notches are what provide this connection of nerves, veins, and arteries without sacrificing protection.

The extensive complex of bone, connective tissue and muscle around this organ does its job well because it takes a lot of force to damage the spinal cord. This function is important because if impairment or damage were to occur there is a potential of devastating loss of bodily signaling. “Spinal cord injury (SCI) results in detrimental loss of bodily functions. (. . .) All experiments resulted in complete dislocation of the tissues between the vertebrae at a mean failure load of 1952.5 ± 396 N” (Krocker 2012). This high load tolerance is due to the formation of the foramen via the vertebral arches and layers of intrinsic back muscles from the deep intertransversariis to the more superficial splenius. Any undesired access to the spinal cord may result in traumatic effects throughout the body. “[With] impairment or loss of motor and/or sensory function in the thoracic, lumbar or sacral segments of the spinal cord, [. . .] depending on the level of injury the trunk, legs and pelvic organs may be involved” (Ditunno 1994).
Therefore it is important that all aspects of the structure of the spinal cord work together for overall resistance to trauma.

The spinal cord thrives comfortably in a protective cushion of meninges and CSF even as the vertebra develop different curvatures and alterations in structure to support the change in support and movement as the spine continues. “Regional variations in the size and shape of the vertebral canal accommodate the varying thickness of the spinal cord” (Moore 2015). Along with a necessary difference in thickness there is a change in the degree of needed flexion/extension, rigidity, and shock absorption from increased load at the lumbar segment contrary to the higher degree of rotation and lighter load in the thoracic segment. Even with these structural changes to meet function the foramen stays unobstructed and accessible as the articular surfaces of the vertebrae change planes and the size of the vertebral bodies thicken.

Conductivity and nutrition via signaling and supply from the brain is necessary for any degree of bodily function independent of location. The complexity of the spinal column lays out the structure to promote the spinal cord to continue its function of a reflex center and communicate pathway between the body and the brain.


Necker, R. (2005). The structure and development of avian lumbosacral specializations of the vertebral canal and the spinal cord with special reference to a possible function as a sense organ of