

Brief over of the spine

"If you take care of it, your spine will get you through to about 40 or 50, after that you're on your own"

Bruce Latimer, Paleoanthropologist

Welcome to the first of what we hope will be an on-going series of short blogs looking at health, well-being and other topics that, well, simply put, pique my interest. Before journeying on, it would be useful to explain something about our bodies, how they are pieced together and work. Being chiropractors, it is natural to start with an overview musculoskeletal system, more specifically, the spine.

From a classification standpoint, humans are vertebrates, that is, we have a vertebral column (verto, from the Latin, mean to turn). The structure of the spine with its many separate vertebra, is highly mobile and provides us with the ability to twist and turn. Of course, the flexibility of youth decreases as we age, but the aging spine is for another time. Over 4 million years ago we (or our hominid ancestors) started walking on two legs. Biomechanically this wasn't the best approach to locomotion but there were other advantages, (again, for another time!).

One of the primary purposes of the vertebra is to protect the spinal cord, the nerves that run from the brain and down the length of the body. This delicate structure carries all of the sensory and motor messages between the outside world, our bodies and the 3-pound mass inside our heads. We also find blood vessels, fatty tissue and lymph within the canal. Starting at the base of the skull and moving to the low back, there are five regions, each in many ways similar yet each with their own unique features.

There is a basic pattern that the vertebrae follow, though there are exceptions and differences in each area. The generalised pattern is a vertebral body with a posterior and lateral extensions that serve as attachment points for muscles, tendons and ligaments.

Between each vertebra sits a disc that is like a jelly donut, when there is a herniation, the internal 'jelly' is extruded and can put pressure on a nerve cause pain and/or altered sensation. This structure acts as a shock absorber but is also the culprit in many spinal problems that we experience. Located on each side of the posterior aspect of the vertebral body is a joint that allows for movement,

the facets. And between vertebrae there are openings for the nerves to extend into the body.

This pattern holds true for three sections: **cervical, thoracic, lumbar**.

The **sacrum** and **coccyx** are rather different since the segments in each of these are fused forming a single large segment in each.

The top-most, the **cervical spine**, carries the weight of the head. There are seven cervical vertebrae (and eight cervical nerves, something that always confuses first year anatomy students). The top two vertebrae, the Atlas (holding the weight of the world) and the Axis allow for a significant amount of rotation and head nodding (flexion and extension in the technical parlance). These are anatomically unique. There is no disc between them, nor between the Atlas and the skull. The Atlas is closely tied to the skull so it can protect the neurological tissue that leads to the brain. The Axis, directly under the Atlas, is a ring of bone with a bony protuberance allowing the Atlas to rotate (like shaking your head 'no').

The remainder of the cervical vertebrae are all similar to one another and repeat the pattern seen throughout. They also are separated by the intervertebral disc. Moving to the next area, the **thoracic spine**, we find 12 vertebrae (though it isn't all that uncommon for there to be 11 or 13), each with a basic structure like the cervical above. Yet there is a major difference. Each of these vertebrae has the added feature of points of contact with the ribs. This rib attachment gives the area an additional stability and provides protection for the heart, lungs and accompanying vessels yet remains mobile enough to permit the expansion and contraction needed for breathing. It also explains why this region is the least likely to have problems compared to both those above and below.

The **lumbar region** is composed of five, large vertebrae. They each have a similar structure to those above with extensions from the body and discs in between. The low back is often involved in disc herniation, when a portion of the internal gel of the disc extrudes out and compresses a nerve. Anatomically, the vertebral bodies of the lumbar have a wider variation from person to person than other regions. Recent research has led to the speculation that people with a vertebral body similar to that of our early ancestors are more prone to disc herniation though there is no clear evidence since the research was only with a small group. At the base is found the sacrum. A group of fused load-bearing vertebrae that acts as the foundation for the spine above. Below the sacrum is the coccyx, what is often spoken of as being the remnants of a tail. There are actually a couple of recorded cases of people developing a tail of some length.

This is a very quick overview, certainly, much more detail could be included. We will be looking at the regions more closely over time. What we do know, is that whatever your problems may be, spinal, or any other joints, it is important to maintain a healthy exercise program and diet for overall health. **If you are suffering from a musculoskeletal problem or simply want advice or general check-up, we are available to help.**

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