

OPTIMAL HEALTH UNIVERSITY™

Presented by Katie Gravesen, DC

Spine 101

A healthy spine is the foundation of a healthy life. But to care for your spine properly, it's first important to understand its structure and function. Dr. Gravesen has compiled the following overview in hopes that patients broaden their knowledge of this vital structure.

The spinal column supports the body's head and trunk. This bony lifeline, with its numerous components, is also known as the vertebral column or backbone.

Dr. Gravesen spends countless hours navigating this strong but flexible superhighway full of twists, turns and exits. Even the slightest deviation on this intricate highway can spur complications ranging from carpal tunnel syndrome to headaches, backaches, infantile colic and ear infections.

To learn more about the ins and outs of the vertebral column — and to help Dr. Gravesen keep you in optimal health — take a few minutes and get acquainted with your spine.

What Are Vertebrae?

The spine is actually a chain of 24 bones known as vertebrae, which rest on a bone called the sacrum — below which is the coccyx. In between the



vertebrae are joints. These joints are cushioned by fluid-filled “pillows” called intervertebral discs (IVDs).

The soft inner section of the IVD is called the nucleus pulposa. Surrounding the nucleus is the sturdier annulus fibrosis.

The vertebral column extends from the skull to the pelvis. In addition to keeping us vertical, its most important job is protecting the spinal cord.

Types of Vertebrae

Vertebrae are categorized by position, shape and function:

Cervical — Taking it from the top down, the first seven vertebrae are known as cervical (C1-C7). These lightweight bones allow for maximum range of motion and flexibility.

Thoracic — The 12 vertebrae in this category form the central part of the spinal column. Located in the upper back, each of the thoracic vertebrae is attached to a rib.

Lumbar — Located in the small of the back, the five stocky lumbar vertebrae are the ultimate workhorses: bearing the weight of the head and the trunk.

Sacrum — This triangular area includes five fused bones and is flanked by the pelvic bones (illium).

Coccyx — Also known as the tailbone, it consists of four fused vertebrae.



Curves Ahead

Dr. Gravesen explains that, although excessive side-to-side spinal curves (scoliosis) are dysfunctional, slight front-to-back curves are essential to spinal health.

The spine's unique design gives it strength and flexibility. Shock absorption is also enhanced — as is balance: the latter by keeping the trunk of the body placed squarely over the feet.

The three normal curves of the vertebral column are:

Cervical lordosis (neck) — the apex in the front or anterior of the body. Loss of this curve results in a straightened or “military” neck. Reversal of this curve results in a jetting forward of the head, or “forward” neck.

Thoracic kyphosis (upper back) — the apex in the back or posterior. Excessive kyphosis results in “hunch back.”

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Lumbar lordosis (low back) — the apex in the anterior of the body. Strong abdominal muscles prevent excessive lordosis or “sway back.”

Vertebrae View

Typically, vertebrae consist of a weight-bearing outer bone, called the *centrum*, which is attached to a ring-shaped arch. Working together, they protect a hole known as the vertebral foramen — where the spinal cord passes through.

Ligaments and back muscles stabilize the vertebral column and create a series of checks and balances.

Vertebral Subluxations

It’s easy to imagine how the delicate balance of the vertebral column can be upset. Repetitive motion, trauma, sports activities and office work may all generate slight alterations in spinal alignment. When vertebrae become misaligned or spinal movement is restricted, the result is a condition known as **vertebral subluxation**. This common occurrence is linked with a myriad of health concerns, such as carpal tunnel syndrome, headaches, backaches, infantile colic and ear infections.

Chiropractors correct vertebral subluxations with safe and gentle maneuvers called **chiropractic adjustments**. But *how* do they detect this condition in the first place?

Doctors of chiropractic use the sense of touch — known as palpation — to determine the existence of vertebral subluxations. In addition, range-of-motion restriction, postural imbalances and muscle tension often indicate the presence of vertebral subluxations. Orthopedic and neurological tests further assist chiropractors in identifying the condition.

Innervation

Imagine a railroad station with trains chugging in and out in every direction.

Your spinal cord is just like a railroad station. Instead of trains, however, nerves enter and exit the “station” at various points: a process called innervation. They slide into the spinal cord by passing in between vertebrae. From the spinal cord, they travel to and from the body’s muscles, organs and other structures.

Each vertebra has its own set of nerves that weave in, out and around it. Dysfunction or injury of the vertebrae can short-circuit this intricate wiring system. Ongoing research indicates that vertebral subluxations may affect nerve transmission and the structures those nerves innervate.

Aberrant Vertebrae

Common spinal abnormalities include:

Extra or missing vertebrae — inborn anomalies usually seen in the cervical or lumbar spine. In some individuals, the upper segment(s) that make up the sacrum are not fused, producing additional vertebrae. People with extra or missing vertebrae may be at an increased risk of back and neck pain.

Spinal spurring — characteristic of osteoarthritis, the edges of the vertebrae produce extra bone.

Fused vertebrae — extreme spinal degeneration when the spinal spurs of adjacent vertebrae extend toward each other and attach, eroding the IVD. Fusion may also be due to a birth defect.

Cervical ribs — vertebrae that slightly extend on the side, resembling under-

developed ribs. These aberrant vertebrae exist from birth and are associated with neck pain, shoulder pain and carpal tunnel disorder.

Spondylolitheses — the partial forward overlapping of one vertebra over the other, most commonly the fifth lumbar vertebra over the first sacral vertebra.

Herniated Discs

When a disc is compromised and the jelly center begins to ooze, it creates a condition known as a herniated disc. The pain, which can be excruciating, may be restricted to the area in the back adjacent to the disc. However, it’s quite common for disc pain to radiate into the limbs — or even into the head.

Herniated discs are often referred to as “slipped,” although this term is a misnomer: The disc itself does not usually move. Rather, it is the material within the disc that escapes.

Chiropractic provides a safe, noninvasive alternative to surgery for many patients with disc herniations. And — with exercise, physiotherapy and chiropractic adjustments — vertebrae may be realigned and disc herniation prevented, without the potential hazards of surgery.

How’s Your Spine?

Remember, even slight misalignments in the spine can trigger chronic conditions.

How’s your spinal health? The best way to find out is to schedule an appointment with your doctor of chiropractic for a complete examination. Don’t put off taking care of your spine — schedule an appointment for a checkup today.

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