

SCOLIOSIS

Your spine, or backbone, consists of the column of 33 bones and tissue that extends from your skull down to your pelvis. Providing the support of your head and body, your backbone encloses and protects a cylinder of nerve tissues, called the spinal chord. The 33 bones in your spine are called vertebrae (one is called a vertebra). The upper 24 vertebrae join together like links in a chain. In between each vertebra is an intervertebral disk, a band of cartilage that acts as a shock absorber between the vertebrae. When someone has a “slipped disk,” he or she has an intervertebral disc that has slipped out of position, thus causing friction between two vertebrae and extreme pain from nerves being exposed. The lowest nine vertebrae are fused (joined) together in two groups, forming the sacrum and coccyx.

The cervical vertebrae are the seven vertebrae that form the upper part of your spine, between the skull and the chest.

The thoracic vertebrae are the 12 bones between your neck and your lower back. Thoracic vertebrae have cup-shaped surfaces called facets, in which the ribs rest and connect to the spine. These ‘joints’ help the ribs to move up and down during breathing.

The lumbar vertebrae are the five largest and strongest of all vertebrae. They are found in your lower back between the chest and hips. The strong muscles of the back are attached to the lumbar vertebrae.

Your sacrum and coccyx are the bones found at the base of your spine. The triangular sacrum—made up of five vertebrae fused together—supports the spine and connects it to the pelvis. Your coccyx, or tailbone, is formed from four fused vertebrae and has little function.

The vertebral foramen is the hollow part of the vertebrae where the spinal chord (nerve tissues) attaches to your brain and sends signals all over your body.

What Is Scoliosis?

About three in every one hundred people has a medical condition causing an s-shaped, side-to-side curve in their spine. While a bit of a lateral curve isn’t anything to worry about, some people with this condition, known as scoliosis, have curvature of the spine that is so severe that it interferes with normal bodily functions.

Most cases of scoliosis develop during the rapid growth spurt of adolescence, becoming apparent during the years of transition from childhood to the time the skeleton reaches maturity. Seven times more common in girls than boys, scoliosis almost always develops before the onset of menstruation, known as menarche. Boys continue to grow well beyond the age of 13, so in them the progression of scoliosis continues to an older age. Once a child has stopped growing taller, scoliosis usually stabilizes, except in some cases involving curves of 50° or more.

Scoliosis is a curvature of the spine. The most common form of scoliosis occurs in adolescents during their rapid growth spurt. It is seven times more common in girls than boys.

Scoliosis has many forms, but by far the most common is called adolescent idiopathic--scoliosis which affects children in their growing years.

About 2% of the overall population has scoliosis, but only about one-half of one percent have it severely enough to interfere with normal functions.

Causes of Scoliosis

Most of the time, the cause of scoliosis is not known. There is some evidence that it may run in families, particularly when girls are affected. For some reason, girls who seem to inherit a tendency to scoliosis tend to grow faster and enter puberty earlier than their peers. Some researchers see this as evidence of a hormonal influence on the disease.

In 20% of all cases children develop scoliosis as a result of spinal injury, cerebral palsy, muscular dystrophy, or spina bifida. Occasionally adults develop the condition as well, perhaps as a progression from a childhood form of the disease, emerging as the result of aging.

Scoliosis is not a condition that can be cured. Instead, the aim of treatment is to watch the progression of the curve, and, if necessary, stabilize it with a temporary brace or surgery.

Symptoms of Scoliosis

Scoliosis carries no symptoms in its early stages. But, the American Academy of Orthopedic Surgeons suggests that parents contact their child's doctor if they notice any of the following signs, beginning at about age 8:

- Uneven Shoulders
- Prominent Shoulder Blade or Shoulder Blades
- Uneven Waist
- Elevated Hips
- Leaning to one side

Screening for scoliosis should involve an examination where:

- Shoulder, rib and hips are checked for symmetry
- Leg lengths are measured
- A forward bend test, with the legs straight, is done so the doctor can check the entire spine for asymmetry between the right and left sides

After screening, a full-length spine x-ray is needed.

Treatment of Scoliosis

If scoliosis is suspected, measurements are made on a spine x-ray with a goniometer, which helps measure the angle of curvature.

In most cases scoliosis is not curable. Instead, stabilization of the curve is the principle aim.

The type of treatment often depends on the extent of the curve. Many curves are minimal and do not progress beyond 20°. Treatment in those cases consists of carefully watching the spine while the child grows. Curves between 20-40° may require a brace to minimize any further curvature. And, curves greater than 40° may require surgery to stop further progression and stabilize the spine.

Treatment should be made on an individual basis depending on your unique child. And, a specialist should decide upon the form of treatment.

Only 20 to 30% of the patients with scoliosis have a form that progresses and so often, the treatment simply consists of monitoring the spinal column.

However, when curves are between 25 and 40°, braces are often helpful during the growing years. The person wearing the brace can still participate in all normal activities. The brace comes off when the child stops growing or if the curvature worsens enough to need surgery.

The most common surgical procedure used is posterior spinal fusion and instrumentation. The fusion connects the vertebrae in the curve to solid bone to keep it from curving even more. The instrumentation part of the surgery involves metal rods, hooks, screws and wires. These instruments can help correct the curvature at the time of surgery but in addition helps hold the curve from changing during the time it takes the fusion to become solid. This can be anywhere from 3 to 12 months. The goal of surgery is to have a straight spine until the growth spurt is over and to allow better function for the rest of the patient's life.

Surgery for scoliosis takes from 3 to 4 hours, and the patient is usually home from the hospital and walking within a week. She can take part in some activities by 3 or 4 months, and by one year she can usually go back to all of her normal activities. Successful surgery gives the patient a straighter spine until the growth spurt is over, prevents further curvature, and allows for better function for the rest of the patient's life.

Possible Complications of Surgery for Scoliosis

Any person with signs of scoliosis should be assessed carefully by an experienced orthopedic surgeon

to determine the best course of treatment. The risks and benefits of all care options must be carefully reviewed. It is important to determine whether the disorder is likely to affect the function of the heart, lungs, and internal organs during the patient's adult life.

Braces act as holding devices to prevent progression of curving in the spine. One will see correction in a brace, but once use of the brace has stopped, the curve usually falls back to initial pre-brace degree. Braces cannot correct curves and they are not effective once growth has stopped. In older patients who have stopped growing, the use of a brace will no longer be of benefit in preventing progression.

In cases where different treatment options exist the physician must work closely with the family and patient to follow a plan designed for the particular individual. X-rays should be obtained at regular intervals to ensure that scoliosis is not progressive, especially in cases where the decision is made not to have surgery. If surgery is chosen, the patient must be aware of the risks involved, the recovery period required, and various limits on activities during that time.

Some of the potential risks of surgery include:

- Injury to nerves and blood vessels
- Risks of anesthesia, including death
- Excessive bleeding
- Blood clots
- Infection

You should carefully consider these risks along with the possible advantages of the surgery, and weigh them carefully. Because the rehabilitation process requires so much effort on your part, it is important that you have a positive attitude if you decide to have the surgery.

Because of rapid advances in medical technology, especially in new spinal instrumentation systems, dramatic corrections of scoliosis are now possible. When required, excellent or good results from surgery are more easily attained than in the past, due mainly to advances in diagnostic imaging and surgical procedure. Advances in physical therapy techniques also represent a source of hope for people – especially young people - recovering from scoliosis.

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