

# Symptoms & Conditions

## Flat Back Syndrome

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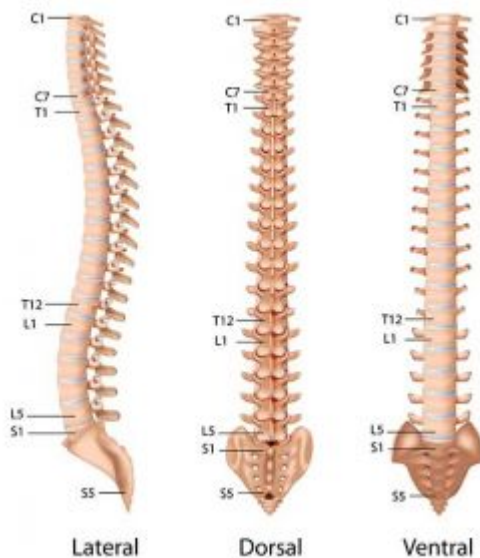
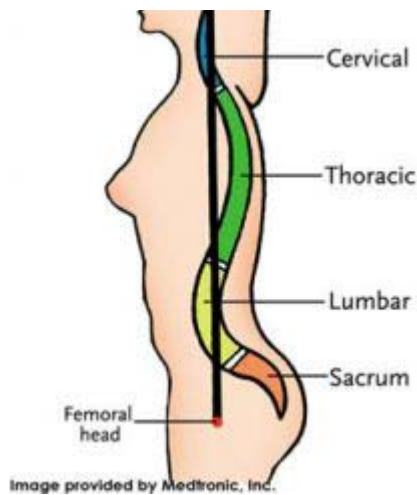
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### *Spinal Curvatures*

The human spine has natural curvatures. When you look at a back from behind, the spine should be straight and centered over the pelvis. However, when you look at the spine from the side, the curves are designed to maintain balance as the spine is behind organs in the chest and abdomen. The spine has two alternating curves to create an “S” like shape. In the neck and low back there is normally an inward curvature or sway back known as lordosis. In the thoracic spine and sacrum there is an outward curvature known as kyphosis or hunchback. These curves normally balance out each other so that when the patient stands they are well balanced with their head straight above their hips when viewed from the side. Standing in this position minimizes the effect of gravity and allows the patient to stand with the best posture and use the least energy when moving or walking.



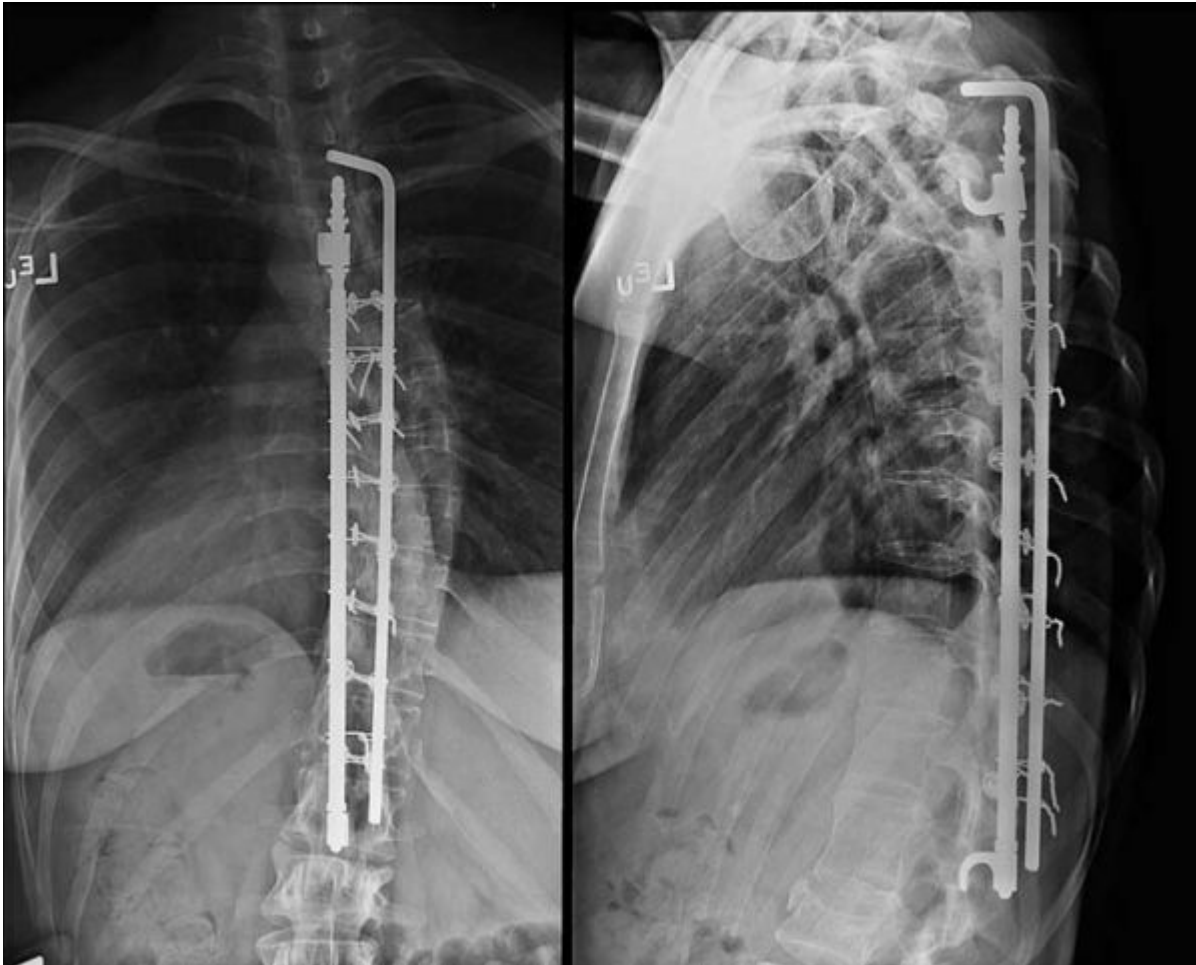


Flat back syndrome is an abnormal condition where the spine loses its natural low back curve to become flat. The spine becomes imbalanced and the patient leans forward. Patients with flat back syndrome typically notice troubles standing upright or have ongoing back or leg pain. Symptoms usually worsen as the day goes on and the patient feels they lean further and further forward the longer they try to stand upright. The severity of the symptoms usually depends on the amount of curvature present and difficulties with standing erect.

*In patients with flat back syndrome, a loss of normal lumbar curvature causes an imbalance of the spine. The patient's head begins to lean forward, away from the body and they may have trouble standing upright. This imbalance can cause muscle fatigue and pain.*

Flat back syndrome was first noted in patients who received a specific type of spinal instrumentation for scoliosis treatment. Early types of scoliosis implants, called Harrington rods, allowed the surgeon to straighten the back curvature but also

decreased the spine's normal side curvature. This instrumentation was used from the 1960s to early 1980s and has a tendency to flatten the normal lordosis of the back. Many patients treated with Harrington rods did very well after surgery however, decades later the unnatural straightening led to early degeneration of discs below their fusion. This ultimately led to an even greater loss of lumbar lordosis and back symptoms. Current scoliosis implant systems and surgical techniques allow surgeons to correct the spine in multiple planes, decreasing the risk of developing lumbar flat back syndrome.



Harrington Rods used to correct flat back syndrome

*This patient is a 37-year-old woman who had scoliosis correction surgery as a teenager. At that time, the rods used to correct the scoliosis were straight and as a result, the patient has developed a loss of normal spinal alignment when viewed from the side.*

## **Causes**

Today, the term flat back syndrome has been broadened to include any patient with a decrease in lumbar lordosis causing symptoms. As such, flat back syndrome can occur as a result of any condition that shortens the front portion of the spine, causing the patient to lean forward. Flat back syndrome may develop as the result of the following causes:

### **Degenerative Disc Disease,**

Lumbar Post Laminectomy Syndrome,

### **Compression Fractures**

### **Ankylosing Spondylitis**

**Degenerative Disc Disease:** For some patients, progressive degeneration of the intervertebral discs or the shock absorbers of the spine may lead to a loss of height in the front part of the spine. As discs degenerate the spine begins to lean forward and lumbar lordosis decreases. The patient may develop pain as a result of the degenerative disc disease or as a result of the spinal imbalance.

**Lumbar Post Laminectomy Syndrome:** Lumbar flat back syndrome may develop in patients previously treated with a laminectomy or other lumbar surgery to decompress the spinal nerves to treat stenosis. These procedures can lead to a decrease in lumbar lordosis and in some cases spinal instability.

**Vertebral Compression Fractures:** Compression fractures are often the result of weak spinal bones due to

#### **osteoporosis**

. A fracture can lead to loss of height of the bone in the thoracic and lumbar spine. This may occur in one bone or in multiple bones throughout the spine, resulting in flat back syndrome.

**Ankylosing Spondylitis:** Ankylosing spondylitis (AS) is a chronic inflammatory disease that causes stiffness and arthritis throughout the entire spine. Some patients with AS notice an increasing forward posture of the spine, including an increase in thoracic kyphosis or decrease in lumbar lordosis. This can lead to symptoms of lumbar flat back syndrome.

## ***Diagnosis***

The diagnosis of lumbar flat back syndrome is made based on the patient's history and **x-rays of the spine**

. The patient typically has difficulty standing upright and may complain of back or leg pain. Previous surgical history is important, including the specific details of any past procedures. It is important to determine if flat back syndrome is the result of a stable spinal structural abnormality or spinal instability. It is also important to determine if there is continued pressure on nerves where spinal stenosis is present.

## ***Treatment***

Many patients with lumbar flat back syndrome may be treated without surgery. Initial treatment typically includes an appropriate exercise routine to include

### **aerobic fitness**

, weight bearing exercise, and

### **core muscle strengthening**

### **Physical therapy**

and

### **spinal manipulation**

may also be beneficial depending on the patient's symptoms.

### **Medications**

are commonly used to manage symptoms of lumbar flat back syndrome. For many patients, conditioning and endurance programs may provide enough strength that symptoms improve. For patients with joint arthritis or pinched nerves,

### **spinal injections**

can also provide relief.

Some patients with structural problems or severe curvatures may ultimately require surgical reconstruction. The goal of lumbar flat back syndrome surgery is to improve the patient's pain and spinal alignment. The team of experts at the Virginia Spine Institute work to restore a more normal alignment of the spine to decrease stress on supporting muscles of the back, hips, and legs.

Surgery may be an option if nonsurgical treatments do not relieve symptoms. Surgery may be needed for patients whose deformity is worsening over time, or who have curvatures leading to nerve compression causing symptoms such as numbness, weakness, or pain. Surgical reconstruction for flat back syndrome involves some

correction of the curvature. Goals of surgery are to relieve pain and prevent the curvature from getting worse in the future.

Surgery to correct flat back deformity may be performed from multiple or combined approaches. The final recommendation is based on the desire to create the least invasive and safest procedure for each patient.





*This patient is a 64-year old female who had lumbar fusion surgery in the past. She did well for years, but then she began leaning forward and to her left side. She developed severe pain that kept her from walking and even standing. Her x-rays revealed flat back deformity with a loss of normal lumbar lordosis and also a new scoliosis. She underwent spinal reconstruction surgery with*

**Dr. Good**

*. During her surgery, a portion of bone was removed (*

**osteotomy**

*) to allow for realignment of her spine and the spine was held in the new alignment using pedicle screw implants. Her X-rays and clinical photographs show excellent correction of her flat back deformity and she has returned to normal activity including working at a greenhouse.*

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