SpineFAQs **Lumbar Spinal Stenosis**

Stenosis means *closing in*. Spinal stenosis describes a condition in which the nerves in the spinal canal are closed in, or compressed. The spinal canal is the hollow tube formed by the bones of the spinal column. Anything that causes this bony tube to shrink can squeeze the nerves inside. As a result of many years of wear and tear on the parts of the spine, the tissues nearest the spinal canal sometimes press against the nerves. This helps explain why *lumbar spinal stenosis* (stenosis of the low back) is a common cause of back problems in adults over 55 years old.

What causes spinal stenosis?

In the lumbar spine, the spinal canal usually has more than enough room for the spinal nerves. The canal is normally 17 to 18 millimeters around, slightly smaller than a penny. Spinal stenosis develops when the canal shrinks to 12 millimeters or less. When the size drops below 10 millimeters, severe symptoms of lumbar spinal stenosis occur.

There are many reasons why symptoms of spinal stenosis develop. Some of the more common reasons include congenital stenosis (being born with a small spinal canal), spinal degeneration, spinal instability, and disc herniation.

> **Congenital stenosis:** Some people are born with (*congenital*) a spinal canal that is narrower than normal. They may not feel problems early in life. However, having a narrow spinal canal puts them at risk for stenosis. Even a minor back injury can cause pressure against the spinal cord. People born with a narrow spinal canal often have

problems later in life, because the canal tends to become narrower due to the effects of aging.

Degeneration: *Degeneration* is the most common cause of spinal stenosis. Wear and tear on the spine from aging and from repeated stresses and strains can cause many problems in the lumbar spine. The intervertebral disc can begin to collapse, and the space between each vertebrae shrinks. Bone spurs may form that stick into the spinal canal and reduce the space available to the spinal nerves. The ligaments that hold the vertebrae together may thicken and also push into the spinal canal. All of these conditions cause the spinal canal to narrow.

Spinal instability: *Spinal instability* can cause spinal stenosis. Spinal instability means that the bones of the spine move more than they should. Instability in the lumbar spine can develop if the supporting ligaments have been stretched or torn from a severe back injury. People with diseases that loosen their connective tissues may also have spinal instability. Whatever the cause, extra movement in the bones of the spine can lead to spinal stenosis.

Disc herniation: Spinal stenosis can occur when an intervertebral disc in the low back herniates (ruptures). Normally, the shock-absorbing disc is able to handle the downward pressure of gravity and the strain from daily activities. However, if the pressure on the disc is too strong, such as landing from a fall in a sitting position, the nucleus inside the disc may rupture through the outer annulus and squeeze out of the disc. This is called a disc *herniation*. If an intervertebral disc herniates straight backward, it can press against the nerves in the spinal canal, causing symptoms of spinal stenosis.

What are the symptoms of spinal stenosis?

Spinal stenosis usually develops slowly over a long period of time. This is because the main cause of spinal stenosis is spinal degeneration in later life. Symptoms rarely develop quickly when degeneration is the source of the problem. A severe injury or a herniated disc may cause symptoms to develop immediately.

Patients with stenosis don't always feel back pain. Primarily, they have pain and weakness in their legs, usually in both legs at the same time. Some people say they feel that their legs are going to give out on them.

Symptoms mainly affect sensation in the lower limbs. Nerve pressure from stenosis can cause a feeling of pins and needles in the skin where the spinal nerves travel. Reflexes become slowed. Some patients report charley horses in their leg muscles. Others report strange sensations like water trickling down their legs.

Symptoms change with the position of the low back. *Flexion* (bending forward) widens the spinal canal and usually eases symptoms. That's why people with stenosis tend to get relief when they sit down or curl up to sleep. Activities such as reaching up, standing, and walking require the spine to straighten or even *extend* (bend back slightly). This position of the low back makes the spinal canal smaller and often worsens symptoms.

How do doctors diagnose spinal stenosis?

Diagnosis begins with a complete history and physical examination. I will ask questions about your symptoms and how your problem is affecting your daily activities. This will include questions about your pain or if you have feelings of numbness or weakness in your legs. I will also want to know whether your symptoms are worse when you're up standing or walking and if they go away when you sit down.

I do a physical examination to see which back movements cause pain or other symptoms. Your skin sensation, muscle strength, and reflexes are also tested.

X-rays can show if the problems are from changes in the bones of the spine. The images can show if degeneration has caused the space between the vertebrae to collapse. X-rays may also show any bone spurs sticking into the spinal canal, but they do not give us detail about the amount of narrowing in the spinal canal.

When more information is needed, I usually order a *magnetic resonance imaging* (MRI) scan. The MRI machine uses magnetic waves rather than X-rays to show the soft tissues of the body. This test gives a clear picture of the spinal canal and whether the nerves inside are being squeezed. This machine creates pictures that look like slices of the area your doctor is interested in. The test does not require dye or a needle.

Computed tomography (a CT scan) may be ordered. The CT scan is a detailed X-ray that lets your doctor see slices of bone tissue. The image can show any bone spurs that may be sticking into the spinal column and taking up space around the spinal nerves. This is typically more valuable when combined with a myelogram where dye is injected into the spine to outline the nerves. The CT scan is then done to allow a better view. I usually order a myelogram and CT Scan for those patients who are unable to have an MRI (such as those who have a pacemaker), if you have had surgery on your spine before, and if we are seriously considering surgical treatment.

How do you treat spinal stenosis?

Unless your condition is causing significant problems or is rapidly getting worse, most doctors will begin with nonsurgical treatments. At first, I may prescribe ways to immobilize the spine. Keeping the back still for a short time can calm inflammation and

pain. This might include one to two days of bed rest. Patients may find that curling up to sleep or lying back with their knees bent and supported gives the greatest relief. These positions flex the spine forward, which widens the spinal canal and can ease symptoms.

A lumbar support belt or corset may be prescribed, though their benefits are controversial. The support can limit pressure in the discs and prevent extra movement in the spine. But it can also cause the back and abdominal muscles to weaken. Some doctors have their patients wear a rigid brace that holds the spine in a slightly flexed position, widening the spinal canal. Health care providers normally only have patients wear a corset for one to two weeks.

Doctors sometimes prescribe medication for patients with spinal stenosis. Patients may be prescribed anti-inflammatory medication such as *nonsteroidal anti-inflammatory drugs* (NSAIDs) like ibuprophen. These medications can cause side effects in the kidneys and gastrointestinal tract. Also, because most stenosis patients are elderly, doctors closely monitor patients who are using these medications to avoid complications.

Narcotic drugs, such as hydrocodone, are generally not prescribed for stenosis patients. They are addictive when used too much or improperly. Muscle relaxants are occasionally used to calm muscles in spasm.

Symptoms of stenosis can lead to mood changes. As a result, doctors sometimes prescribe anti-depressant medication, called *tricyclics*. Tricyclics help steady peoples' moods, and some tricyclics even improve sleep by helping the body make an important hormone called *serotonin*. These medications also seem to calm back pain by affecting the membranes around pain nerves.

Some patients are given an *epidural steroid injection* (ESI). The spinal cord is covered by a material called *dura*. The space between the dura and the spinal column is called the *epidural space*. It is thought that injecting steroid medication into this space fights inflammation around the nerves, the discs, and the facet joints. This can reduce swelling and give the nerves more room inside the spinal canal.

Patients often work with a physical therapist. By evaluating your condition, your therapist can assign positions and exercises to ease your symptoms. Your therapist may suggest using *traction*. Traction is a common treatment for stenosis. It gently stretches the low back, taking pressure off the spinal nerves. Your therapist may also suggest strengthening and aerobic exercises. Strengthening exercises focus on improving the strength and control of the back and abdominal muscles. Aerobic exercises are used to improve heart and lung health and increase endurance in the spinal muscles. Stationary biking offers a good aerobic treatment and keeps the spine bent slightly forward, a position affording relief to many patients with lumbar stenosis.

Is surgery an option?

If the symptoms you feel are mild and there is no danger they'll get worse, surgery is not usually recommended. When there are signs that pressure is building on the spinal nerves, surgery may be required, sometimes right away. The signs doctors watch for when reaching this decision include weakening in the leg muscles, pain that won't ease up, and problems with the bowels or bladder. Pressure on the spinal nerves can cause a loss of control in the bowels or bladder. This is an emergency. If the pressure isn't relieved, it can lead to permanent paralysis of the bowels and bladder. Surgery is recommended to remove pressure from the nerves.

The main surgical procedure used to treat spinal stenosis is *lumbar laminectomy*. Some patients also require *fusion surgery* immediately after the laminectomy procedure if spinal instability is present.

Lumbar Laminectomy - The *lamina* is the covering layer of the bony ring of the spinal column. It forms a roof-like structure over the back of the spinal canal. When the nerves in the spinal canal are being squeezed by a herniated disc or bone spurs, a *lumbar laminectomy* removes the entire lamina to release pressure on the spinal nerves. This is the primary type of surgery used for lumbar spinal stenosis.

Posterior Lumbar Fusion - A *posterior lumbar fusion* may be needed after a surgeon performs a lumbar laminectomy. The fusion procedure is recommended when a spinal segment has become loose or unstable. A fusion surgery joins two or more bones into one solid bone. This keeps the bones and joints from moving. In this procedure, the surgeon lays small grafts of bone over the back of the spine. Most surgeons also apply metal plates and screws to prevent the two vertebrae from moving. This protects the graft so it can heal better and faster.

X-Stop - This is a new technique to surgically assist patients with spinal stenosis. The X-Stop device is a metallic spacer that is placed between the spinous processes of the spine to limit the ability of the spine to extend backwards. This can, in the right patient, reduce or eliminate the leg pain that comes from mild to moderate stenosis. Not everyone is a candidate for the X-Stop. You should only have stenosis at one or two levels, have pain that goes away with sitting or bending forward, have an intact spine, and do not have osteoporosis. Long term results of the X-Stop are unknown at this time.