

# Low Back Pain

Low back pain is one of the main reasons Americans visit their doctor. For adults over 40, it ranks third as a cause for doctor visits, after heart disease and arthritis. Eighty percent of people will have low back pain at some point in their lives. And nearly everyone who has low back pain once will have it again.

Very few people who feel pain in their low back have a serious medical problem. Ninety percent of people who experience low back pain for the first time get better in two to six weeks. Only rarely do people with low back pain develop chronic back problems.

With these facts in mind, you can be assured that back pain is common, that it usually only causes problems for a short period of time, and that you can take steps to ease symptoms and prevent future problems.

## Causes

There are many causes of low back pain. Doctors are not always able to pinpoint the source of a patient's pain. But your doctor will make every effort to ensure that your symptoms are not from a serious medical cause, such as cancer or a spinal infection.

The vast majority of back problems are a result of wear and tear on the parts of the spine over many years. This process is called degeneration. Over time, the normal process of aging can result in degenerative changes in all parts of the spine.

Injuries to the spine, such as a fracture or injury to the disc, can make the changes happen even faster. There is strong evidence that cigarette smoking also speeds up degeneration of the spine. Scientists have found links among family members, showing that genetics plays a role in how fast these changes occur.

## Mechanical and Neurogenic Pain

To best understand the cause of your pain, spine specialists sometimes divide low back pain into two categories:

### Mechanical Pain

Mechanical back pain is caused by wear and tear in the parts of the lumbar spine. This type of pain is similar in nature to a machine that begins to wear out. Mechanical pain usually starts from degenerative changes in the disc. As the disc begins to collapse and the space between the vertebrae narrows, the facet joints may become inflamed. Mechanical pain typically gets worse after activity due to strain on the moving parts of the spine. Mechanical pain is usually felt in the back, but it may spread into the buttocks, hips, and thighs. The pain rarely goes down past the knee. Mechanical back pain usually doesn't cause weakness or numbness in the leg or foot, because the problem is not from pressure on the spinal nerves.

### Neurogenic Pain

Neurogenic pain means pain from nerve injury. Neurogenic pain occurs when spinal nerves are inflamed, squeezed, or pinched. This can happen when a disc herniates or when a nerve gets pinched where it leaves the spine. Recently it has also become known that when a disc ruptures, chemicals are released that inflame the nerves even if there is no pressure directly on the nerve. Neurogenic symptoms concern doctors more than mechanical pain because they can signal damage to the nerves and lead to weakness or numbness in the lower extremities.

The nerve pressure causes symptoms in the areas where the nerve travels, rather than in the low back. This happens because pressure on the spinal nerve affects structures away from the spine, such as the

muscles. As a result, a person's back may not hurt, yet the person feels pain, numbness, or weakness in the leg or foot. This indicates there's a problem with the body's electrical wiring. The pressure on the nerve affects how the body functions. Muscles weaken. Reflexes slow. Sensations of pins, needles, and numbness may be felt where the nerve travels.

## **Spine Conditions**

The effects of spine degeneration or back injury can lead to specific spine conditions. These include

- Annular tears
- Internal disc disruption
- Herniated disc
- Facet joint arthritis
- Spinal stenosis
- Foraminal stenosis

### **Annular Tears**

Our intervertebral discs change with age, much like our hair turns gray. Perhaps the earliest stage of degeneration occurs due to tears that occur in the annulus. These tears can result from wear and tear over a period of time. They can also be the result of a sudden injury to the disc due to a twist or increased strain on the disc that overpowers the strength of the annulus. These annular tears may cause pain in the back until they heal with scar tissue.

### **Internal Disc Disruption**

Multiple annular tears can lead to a disc that becomes weak. The disc starts to degenerate and collapse. The vertebrae begin to compress together. The collapsing disc can be the source of pain because it has lost the ability to be a shock absorber between the vertebrae. This condition is sometimes referred to as internal disc disruption. This type of problem causes primarily mechanical back pain due to inflammation of the disc and surrounding structures.

### **Herniated Disc**

A disc that has been weakened may rupture or herniate. If the annulus ruptures, or tears, the material in the nucleus can squeeze out of the disc, or herniate. A disc herniation usually causes compressive problems if the disc presses against a spinal nerve. The chemicals released by the disc may also inflame the nerve root, causing pain in the area where the nerve travels down the leg. This type of pain is referred to as sciatica.

Even a normal disc can rupture. Heavy, repetitive bending, twisting, and lifting can place too much pressure on the disc, causing the annulus to tear and the nucleus to rupture into the spinal canal.

### **Facet Joint Arthritis**

The facet joints along the back of the spinal column link the vertebrae together. They are not meant to bear much weight. However, if a disc loses its height, the vertebra above the disc begins to compress toward the one below. This causes the facet joints to press together. Articular cartilage covers the surfaces where these joints meet. Like other joints in the body that are covered with articular cartilage, the facet joints can develop osteoarthritis as the articular cartilage wears away over time. Extra pressure on the facet joints, such as that from a collapsing disc, can speed the degeneration in the facet joints. The swelling and inflammation from an arthritic facet joint can be a source of low back pain.

### **Segmental Instability**

Segmental instability means that the vertebral bones within a spinal segment move more than they should. In the lumbar spine, this can develop if the disc has degenerated. Usually the supporting ligaments around the vertebrae have also been stretched over time.

Segmental instability also includes conditions in which a vertebral body begins to slip over the one below it. When a vertebral body slips too far forward, the condition is called spondylolisthesis. Whatever the cause, this extra movement in the bones of the spine can create problems. It can lead to mechanical pain simply because the structures of the spine move around too much and become inflamed and painful. The extra movement can also cause neurogenic symptoms if the spinal nerves are squeezed as a result of the segmental instability.

### **Spinal Stenosis**

Stenosis means closing in. Spinal stenosis refers to a condition in which the tissues inside the spinal canal are closed in, or compressed. The spinal cord ends at L2. Below this level, the spinal canal contains only spinal nerves that travel to the pelvis and legs. When stenosis narrows the spinal canal, the spinal nerves are squeezed inside the canal.

The pressure from the condition can cause problems in the way the nerves work. The resulting problems include pain and numbness in the buttocks and legs and weakness in the muscles supplied by the nerves. Because these nerves travel to the bladder and rectum, weakness in these muscles can cause problems with control of the bladder and bowels.

### **Foraminal Stenosis**

Spinal nerves exit the spinal canal between the vertebrae in a tunnel called the neural foramen. Anything that causes this tunnel to become smaller can squeeze the spinal nerve where it passes through the tunnel. This condition is called foraminal stenosis, meaning the foramen is narrowed. As the disc collapses and loses height, the vertebral body above begins to collapse toward the one below. The opening around the nerve root narrows, squeezing the nerve. Arthritis of the facet joints causes bone spurs to form and point into the foramen, causing further nerve compression and irritation. Foraminal stenosis can cause a combination of mechanical pain and neurogenic pain from the irritated nerve root.

## **Treatment**

Ninety percent of people who experience low back pain for the first time get better in two to six weeks without any treatment at all. Patients often do best when encouraged to stay active and to get back to normal activities as soon as possible, even if there is still some pain. The pain may not go away completely. One goal of treatment is to help you find ways to control the pain and allow you to continue to do your normal activities.

### **Nonsurgical Treatment**

Whenever possible, doctors prefer to use treatments other than surgery. The first goal of these nonsurgical treatments is to ease your pain and other symptoms.

#### **Bed Rest**

In cases of severe pain, doctors may suggest a short period of bed rest, usually no more than two days. Lying on your back can take pressure off sore discs and nerves. Most doctors advise against strict bed rest and prefer that patients do ordinary activities using pain to gauge how much is too much.

## Back Brace

A back support belt is sometimes recommended when back pain first strikes. It can help provide support and lower the pressure inside a problem disc. Patients are encouraged to gradually discontinue wearing the support belt over a period of two to four days. Otherwise, back muscles begin to rely on the belt and start to shrink (atrophy).

## Medications

Many different types of medications are typically prescribed to help gain control of the symptoms of low back pain. There is no medication that will cure low back pain. Medications are prescribed to help with sleep disturbances and to help control pain, inflammation, and muscle spasm.

## Physical Therapy and Exercise

In addition to other nonsurgical treatments, doctors often ask their patients to work with a physical therapist. Therapy treatments focus on relieving pain, improving back movement, and fostering healthy posture. A therapist can design a rehabilitation program to address a particular condition and to help the patient prevent future problems. There is a great deal of scientific proof that exercise and increased overall fitness reduce the risk of developing back pain and can improve the symptoms of back pain once it begins.

## Injections

Spinal injections are used for both treatment and diagnostic purposes. There are several different types of spinal injections that your doctor may suggest. These injections usually use a mixture of an anesthetic and some type of cortisone preparation. The anesthetic is a medication that numbs the area where it is injected. If the injection takes away your pain immediately, this gives your doctor important information suggesting that the injected area is indeed the source of your pain. The cortisone decreases inflammation and can reduce the pain from an inflamed nerve or joint for a prolonged period of time.

Some injections are more difficult to perform and require the use of a fluoroscope. A fluoroscope is a special type of X-ray that allows the doctor to see an X-ray picture continuously on a TV screen. The fluoroscope is used to guide the needle into the correct place before the injection is given.

***Epidural Steroid Injection (ESI):*** Back pain from inflamed nerve roots and facet joints may benefit from an epidural steroid injection (ESI). In an ESI, the medication mixture is injected into the epidural space around the nerve roots. Generally, an ESI is given only when other nonoperative treatments aren't working. ESIs are not always 100% successful in relieving pain and they may only provide temporary relief.

***Selective Nerve Root Injection:*** Another type of injection to place steroid medication around a specific inflamed nerve root is called a selective nerve root injection. The fluoroscope is used to guide a needle directly to the painful spinal nerve root. The nerve root is then bathed with the medication. Some doctors believe this procedure gets more medication to the painful spot. In difficult cases, the selective nerve root injection can also help surgeons decide which nerve root is causing the problem before surgery is planned.

***Facet Joint Injection:*** When the problem is thought to be in the facet joints, an injection into one or more facet joints can help determine which joints are causing the problem and ease the pain as well. The fluoroscope is used to guide a needle directly into the facet joint. The facet joint is then filled with medication mixture. If the injection immediately eases the pain, it helps confirm that the facet joint is a source of pain. The steroid medication will reduce the inflammation in the joint over a period of days and may reduce or eliminate your back pain.

***Trigger Point Injections:*** Injections of anesthetic medications mixed with a cortisone medication are sometimes given in the muscles, ligaments, or other soft tissues near the spine. These injections are called trigger point injections. These injections can help relieve back pain and ease muscle spasm and tender points in the back muscles.