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Low Back Pain

Almost everyone will experience low back pain at some point in their lives. This pain can vary from mild to severe. It can be short-lived or long-lasting. However it happens, low back pain can make many everyday activities difficult to do.

Anatomy

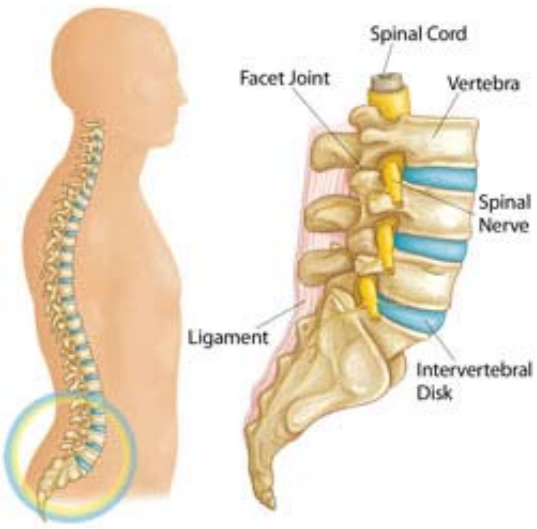
Understanding your spine and how it works can help you understand why you have low back pain.

Your spine is made up of small bones, called vertebrae, which are stacked on top of one another. Muscles, ligaments, nerves, and intervertebral disks are additional parts of your spine.

Vertebrae

These bones connect to create a canal that protects the spinal cord. The spinal column is made up of three sections that create three natural curves in your back: the curves of the neck area (cervical), chest area (thoracic), and lower back (lumbar). The lower section of your spine (sacrum and coccyx) is made up of vertebrae that are fused together.

Five lumbar vertebrae connect the upper spine to the pelvis.



Parts of the lumbar spine.

Spinal Cord and Nerves

These "electrical cables" travel through the spinal canal carrying messages between your brain and muscles. Nerves branch out from the spinal cord through openings in the vertebrae.

Muscles and Ligaments

These provide support and stability for your spine and upper body. Strong ligaments connect your vertebrae and help keep the spinal column in position.

Facet Joints

Between vertebrae are small joints that help your spine move.

Intervertebral Disks

Intervertebral disks sit in between the vertebrae.

When you walk or run, the disks act as shock absorbers and prevent the vertebrae from bumping against one another. They work with your facet joints to help your spine move, twist, and bend.

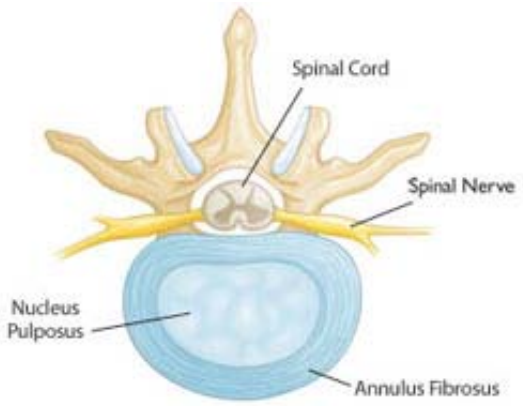
Intervertebral disks are flat and round, and about a half inch thick. They are made up of two components.

Annulus fibrosus. This is the tough, flexible outer ring of the disk. It helps connect to the vertebrae.

Nucleus pulposus. This is the soft, jelly-like center of the annulus fibrosus. It gives the disk its shock-absorbing capabilities.

Description

Back pain is different from one person to the next. The pain can have a slow onset or come on suddenly. The pain may be intermittent or constant. In most cases, back pain resolves on its own within a few weeks.



Healthy intervertebral disk (cross-section view).

Cause

There are many causes of low back pain. It sometimes occurs after a specific movement such as lifting or bending. Just getting older also plays a role in many back conditions.

Lumbar ligament tear.

As we age, our spines age with us. Aging causes degenerative changes in the spine. These changes can start in our 30s — or even younger — and can make us prone to back pain, especially if we overdo our activities.

These aging changes, however, do not keep most people from leading productive, and generally, pain-free lives. We have all seen the 70-year-old marathon runner who, without a doubt, has degenerative changes in her back!

Over-activity

One of the more common causes of low back pain is muscle soreness from over-activity. Muscles and ligament fibers can be overstretched or injured.

This is often brought about by that first softball or golf game of the season, or too much yard work or snow shoveling in one day. We are all familiar with this "stiffness" and soreness in the low back — and other areas of the body — that usually goes away within a few days.

Disk Injury

Some people develop low back pain that does not go away within days. This may mean there is an injury to a disk.

Disk tear. Small tears to the outer part of the disk (annulus) sometimes occur with aging. Some people with disk tears have no pain at all. Others can have pain that lasts for weeks, months, or even longer. A small number of people may develop constant pain that lasts for years and is quite disabling. Why some people have pain and others do not is not well understood.

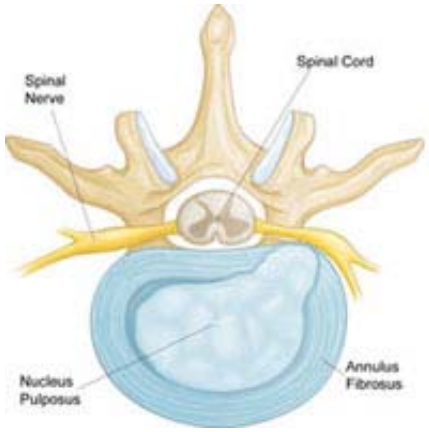
Disk herniation. Another common type of disk injury is a "slipped" or herniated disc.

A disk herniates when its jelly-like center (nucleus) pushes against its outer ring (annulus). If the disk is very worn or injured, the nucleus may squeeze all the way through. When the herniated disk bulges out toward the spinal canal, it puts pressure on the sensitive spinal nerves, causing

pain.

Because a herniated disk in the low back often puts pressure on the nerve root leading to the leg and foot, pain often occurs in the buttock and down the leg. This is sciatica.

A herniated disk often occurs with lifting, pulling, bending, or twisting movements.



Herniated disk.

Disk Degeneration

With age, intevertebral disks begin to wear away and shrink. In some cases, they may collapse completely and cause the facet joints in the vertebrae to rub against one another. Pain and stiffness result.

This "wear and tear" on the facet joints is referred to as osteoarthritis. It can lead to further back problems, including spinal stenosis.

Disk degeneration.

Degenerative Spondylolisthesis

(Spon-dee-low-lis-THEE-sis). Changes from aging and general wear and tear make it hard for your joints and ligaments to keep your spine in the proper position. The vertebrae move more than they should, and one vertebra can slide forward on top of another. If too much slippage occurs, the bones may begin to press on the spinal nerves.

Spondylolisthesis.

Spinal Stenosis

Spinal stenosis occurs when the space around the spinal cord narrows and puts pressure on the cord and spinal nerves.

When intervertebral disks collapse and osteoarthritis develops, your body may respond by growing new bone in your facet joints to help support the vertebrae. Over time, this bone overgrowth - called spurs - can lead to a narrowing of the spinal canal. Osteoarthritis can also cause the ligaments that connect vertebrae to thicken, which can narrow the spinal canal.

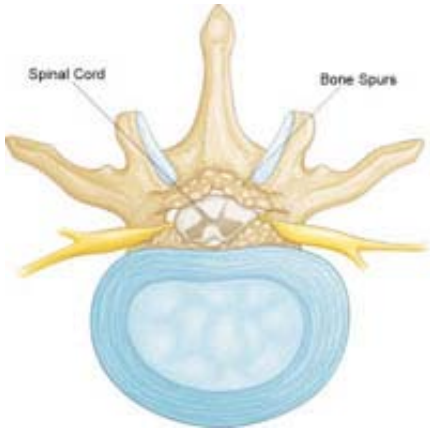
Scoliosis

This is an abnormal curve of the spine that may develop in children, most often during their teenage years. It also may develop in older patients who have arthritis. This spinal deformity may cause back pain and possibly leg symptoms, if pressure on the nerves is involved.

Additional Causes

There are other causes of back pain, some of which can be serious.

If you have vascular or arterial disease, a history of cancer, or pain that is always there despite your activity level or position, you should consult your primary care doctor.



Spinal stenosis.

Symptoms

Back pain varies. It may be sharp or stabbing. It can be dull, achy, or feel like a "charley horse" type cramp. The type of pain you have will depend on the underlying cause of your back pain.

Most people find that reclining or lying down will improve low back pain, no matter the underlying cause.

People with low back pain may experience some of the following:

- Back pain may be worse with bending and lifting.
- Sitting may worsen pain.
- Standing and walking may worsen pain
- Back pain comes and goes, and often follows an up and down course with good days and bad days.
- Pain may extend from the back into the buttock or outer hip area, but not down the leg.
- Sciatica is common with a herniated disk. This includes buttock and leg pain, and even numbness, tingling or weakness that goes down to the foot. It is possible to have sciatica without back pain.

Regardless of your age or symptoms, if your back pain does not get better within a few weeks, or is associated with fever, chills, or unexpected weight loss, you should call your doctor.

Tests and Diagnosis

Medical History and Physical Examination

After discussing your symptoms and medical history, your doctor will examine your back. This will include looking at your back and pushing on different areas to see if it hurts. Your doctor may have you bend forward, backward, and side to side to look for limitations or pain.

Your doctor may measure the nerve function in your legs. This includes checking your reflexes at your knees and ankles, as well as strength testing and sensation testing. This might tell your doctor if the nerves are seriously affected.

Imaging Tests

Other tests which may help your doctor confirm your diagnosis include:

X-rays. Although they only visualize bones, simple X-rays can help determine if you have the most obvious causes of back pain. It will show broken bones, aging changes, curves, or deformities. X-rays do not show disks, muscles, or nerves.

Magnetic resonance imaging (MRI). This study can create better images of soft tissues, such as muscles, nerves, and spinal disks. Conditions such as a herniated disk or an infection are more visible in an MRI scan.

Computerized axial tomography (CAT) scans. If your doctor suspects a bone problem, he or she may suggest a CAT scan. This study is like a three-dimensional X-ray and focuses on the bones.

Bone scan. A bone scan may be suggested if your doctor needs more information to evaluate your pain and

to make sure that the pain is not from a rare problem like cancer or infection.

Bone density test. If osteoporosis is a concern, your doctor may order a bone density test. Osteoporosis weakens bone and makes it more likely to break. Osteoporosis by itself should not cause back pain, but spinal fractures due to osteoporosis can.

Treatment

In general, treatment for low back pain falls into one of three categories: medications, physical medicine, and surgery.

Nonsurgical Treatment

Medications. Several medications may be used to help relieve your pain.

- Aspirin or acetaminophen can relieve pain with few side effects.
- Non-steroidal anti-inflammatory medicines like ibuprofen and naproxen reduce pain and swelling.
- Narcotic pain medications, such as codeine or morphine, may help.
- Steroids, taken either orally or injected into your spine, deliver a high dose of anti-inflammatory medicine.

Physical medicine. Low back pain can be disabling. Medications and therapeutic treatments combined often relieve pain enough for you to do all the things you want to do.

- **Physical therapy** can include passive modalities such as heat, ice, massage, ultrasound, and electrical stimulation. Active therapy consists of stretching, weight lifting, and cardiovascular exercises. Exercising to restore motion and strength to your lower back can be very helpful in relieving pain.
- **Braces** are often used. The most common brace is a corset-type that can be wrapped around the back and stomach. Braces are not always helpful, but some people report feeling more comfortable and stable while wearing them.
- **Chiropractic or manipulation therapy** is provided in many different forms. Some patients have relief from low back pain with these treatments.
- **Traction** is often used, but without scientific evidence for effectiveness.
- **Other exercise-based programs,** such as Pilates or yoga are helpful for some patients.

Surgical Treatment

Surgery for low back pain should only be considered when nonsurgical treatment options have been tried and have failed. It is best to try nonsurgical options for 6 months to a year before considering surgery.

In addition, surgery should only be considered if you doctor can pinpoint the source of your pain.

Surgery is not a last resort treatment option "when all else fails." Some patients are not candidates for surgery, even though they have significant pain and other treatments have not worked. Some types of chronic low back pain simply can not be treated with surgery.

Spinal Fusion. This is essentially a "welding" process. The basic idea is to fuse together the painful vertebrae so that they heal into a single, solid bone.

Spinal fusion eliminates motion between vertebral segments. It is an option when motion is the source of pain. For example, your doctor may recommend spinal fusion if you have spinal instability, a bad curvature

(scoliosis), or severe degeneration of one or more of your disks. The theory is if the painful spine segments do not move, they should not hurt.

Fusion of the vertebrae in the lower back has been performed for decades. A variety of surgical techniques have evolved. In most cases, a bone graft is used to fuse the vertebrae. Screws, rods, or a "cage" are used to keep your spine stable while the bone graft heals.

The surgery can be done through your abdomen, your side, your back, or a combination of these. There is even a procedure that is done through a small opening next to your tailbone. No one procedure has been proven better than another.

The results of spinal fusion for low back pain vary. It can be very effective at eliminating pain, not work at all, and everything in between. Full recovery can take more than a year.

Disc Replacement. This procedure involves removing the disk and replacing it with artificial parts, similar to replacements of the hip or knee.

The goal of disk replacement is to allow the spinal segment to keep some flexibility and maintain more normal motion.

The surgery is done through your abdomen, usually on the lower two disks of the spine.

Prevention

It may not be possible to prevent low back pain. We cannot avoid the normal wear and tear on our spines that goes along with aging. But there are things we can do to lessen the impact of low back problems. Having a healthy lifestyle is a good start.

Exercise

Combine aerobic exercise, like walking or swimming, with specific exercises to keep the muscles in your back and abdomen strong and flexible.

Proper Lifting

Be sure to lift heavy items with your legs, not your back. Do not bend over to pick something up. Keep your back straight and bend at your knees.

Weight

Maintain a healthy weight. Being overweight puts added stress on your lower back.

Avoid Smoking

Both the smoke and the nicotine cause your spine to age faster than normal.

Proper Posture

Good posture is important for avoiding future problems. A therapist can teach you how to safely stand, sit, and lift.

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