

## Back Pain basic level

### Overview

Back pain results when the spine is stressed by injury, poor posture, disease, wear and tear, or poor body mechanics. Most people will suffer from back pain at some point in their life. Acute back pain is abrupt, intense pain that subsides after a period of days or weeks. It typically resolves with rest, exercise, and other self-care measures. Some people suffer from chronic pain that continues despite treatment.

You play an important role in the prevention and healing process of back pain. Strong, flexible muscles help to promote a healthy back that maintains good alignment, allows movement, and provides structural support.

### Anatomy of the back

The low back region of the spinal column is called the lumbar spine. Protected within the bones of the lumbar spine are the spinal cord, nerves, and blood vessels. The five lumbar bones are called vertebrae and are numbered L1 to L5. Each bone is separated and cushioned by shock-absorbing discs (Fig. 1). Each disc contains a fibrous outer layer called the annulus that surrounds a gel-filled inner layer called the nucleus. The vertebrae are held in place by muscles and ligaments that provide support and enable movement of your body. The spinal nerves exit the spinal column through holes called foraminae on both sides of the vertebra. The lumbar spine supports the weight of your body and can be a prime location for injury and pain (see Anatomy of the Spine).

### Types of back pain

Back pain ranges from mild to severe, and is classified as either acute or chronic.

**Acute low back pain** often relates to soft tissue injury (e.g., sprains of muscles, tendons, or ligaments) or disc herniation. Acute pain occurs suddenly and usually heals within several days to weeks. Its severity relates directly to the extent of tissue injury and resolves with over time. It is often called acute mechanical back pain, because the source of the pain may be in the spinal joints, discs, vertebrae, or soft tissues.

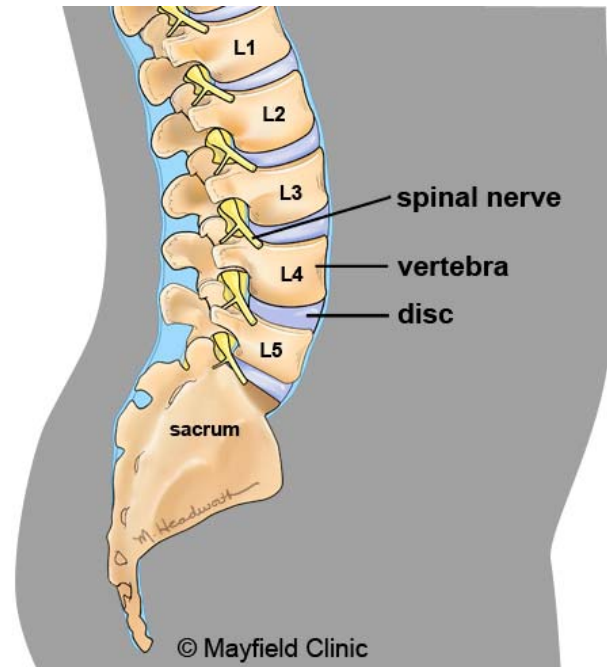


Figure 1. (side view) The lumbar region of the spine has five vertebrae numbered L1 to L5. The lumbar spine supports the weight of your body and can be a prime location for injury and pain.

**Chronic back pain** persists (lasts more than 3 months) and its source may be hard to determine. Chronic pain may be present all the time, or worsen with certain activities, poor posture, and improper body mechanics. Other contributing factors may be related to nerve cell changes, tissue scarring, arthritic changes, or psychological effects of chronic pain. In some cases, the complexity of chronic symptoms requires consultation with pain management specialists (see Pain Management).

### What are the symptoms?

Signs and symptoms of back pain may be stiffness, tightness, aching, burning or stabbing or shooting pains, pressure, or tingling. Most people experience pain primarily in their low back area. The pain may spread to the buttocks, thighs, or knees. Many people may also experience muscle spasms. The symptoms are generally more noticeable when bending or arching the back, when lifting heavy objects, or when sitting or standing for long periods of time.

If you experience extreme leg weakness or difficulty controlling bladder or bowel function, a condition called cauda equina syndrome, you should seek medical help immediately.

### What are the causes?

Back pain can result from injury, poor posture, stress, natural wear, disease, and other sources. Poor spinal alignment (e.g., slouching, sleeping on the stomach) and improper movement (e.g., poor lifting technique) stress the spine and make injuries more likely. The cause of acute low back pain may be identified only 20% of the time. Most of the time, the specific cause cannot be found. Back pain can result from:

**Injury or trauma:** A significant force can stress the structures of the spine, for example, sports injury, or fall. Fractures, such as vertebral compression fractures, can result. A tear in the muscles and ligaments of the back may predispose the discs to bulge or herniate.

**Bulging and herniated disc:** The gel-like material within the disc can bulge or rupture through a weak area in the surrounding wall (annulus). Irritation, pain and swelling occur when this material squeezes out and comes in contact with a spinal nerve.

**Pinched nerve:** When a spinal nerve is compressed, pain may run down your leg into your feet, called radiculopathy (see Sciatica).

**Osteoarthritis** (degenerative disc disease): As discs naturally wear out, bone spurs form and the facet joints inflame. The discs dry out and shrink, losing their flexibility and cushioning properties. The disc spaces get smaller. These changes lead to stenosis or disc herniation.

**Stenosis:** Narrowing of the spinal canal occurs as discs bulge or protrude, facet joints enlarge, and ligaments stiffen over time. As the spinal canal narrows, it compresses the cord and nerves, causing them to swell and inflame.

**Spondylolysis:** A weakness or stress fracture develops in one of the bony bridges that connect the upper and lower facet joints.

**Spondylolisthesis:** A weakness in the muscles and ligaments predisposes the vertebra to slip out of normal position.

Fewer than 1% of people who suffer acute low back pain have a serious cause, such as cancer, infection, or cauda equina syndrome.

Test	Structures seen	What it detects	Example
X-ray	Bone	Extent of wear, bone disease, misalignment	Osteoarthritic changes, fracture, bone spurs, slippage
CT	Bone, soft tissue	Relationship of bones, soft tissues, nerve roots	Stenosis, bone spurs, spinal canal narrowing, disc herniation
Discogram	Disc	Site of pain origin	Disc herniation
MRI	Soft tissue	Detail of soft tissues, discs, nerve roots, spinal cord	Disc herniation, tumor
Myelogram (x-ray fluoroscope), CT/myelogram	Spinal canal seen by dye injection	View of spinal cord and nerve roots in relation to bone	Pinched nerve, bony overgrowth, spinal abscess, tumor
EMG-NCS	Nerve, muscle	Assessment of muscle (EMG) and nerve (NCS) function	Nerve damage

Table 1. Diagnostic tests used to evaluate back pain.

### How is a diagnosis made?

A careful medical examination will help determine the type of back problem and its cause, and the best treatment options. Diagnosis requires evaluation that includes a medical history, physical exam, and sometimes, diagnostic tests (Table 1).

### What treatments are available?

In developing a treatment plan, your physician or healthcare provider will assess the type of disease or condition, and its impact. A team approach for treatment of back problems is often the most effective. Medical treatments include surgical or nonsurgical care and self-care strategies. The goal is to restore function and prevent re-injury.

**Self care:** Most back pain resolves with self-care measures such as rest, ice or heat, massage, over-the-counter pain relievers, or gentle stretches (see Self Care for Neck and Back Pain). Applying ice and then heat is helpful to relax the muscles and decrease muscle inflammation. We generally recommend that you apply an ice pack for 20 minutes several times a day during the first 48 hours. A warm shower or a heating pad on the low setting may help relax tight muscles. A short period of bed rest is okay, but more than a couple of days does more harm than good. If home treatments aren't working within the first couple of days, see your doctor.

**Medications:** Your doctor may prescribe nonsteroidal anti-inflammatory drugs (ibuprofen or naproxen) to reduce inflammation and relieve pain. If you have spasms, a muscle relaxant may be prescribed. If the pain is severe, an analgesic that can be taken with the NSAID or muscle relaxant may be prescribed.

Steroids can be used to reduce the swelling and inflammation of the nerves. They are taken orally (as a Medrol dose pack) in a tapering dosage over a five-day period or as an injection directly into the source of pain (see epidural steroid injections and facet injections). Steroids may provide almost immediate pain relief within 24-hours.

**Physical therapy:** For moderate to mild back pain, we recommend a near-normal schedule from the onset. The goal of physical therapy is to help you return to full activity as soon as possible and prevent re-injury. Physical therapists can instruct you on proper lifting and walking techniques, and they'll work with you to strengthen and stretch your lower back, leg, and stomach muscles. Exercise and strengthening exercises are key elements to your treatment and should become part of your life-long daily routine. Massage, ultrasound, diathermy, heat, and traction may also be recommended for short periods. Patients may also benefit from chiropractic manipulation and acupuncture.

**Surgery:** Surgery is rarely recommended unless you have muscle weakness, a proven disc herniation, severe stenosis, cauda equina syndrome, or if the pain is severe and not resolved after a reasonable course of nonsurgical treatment.

### Recovery and prevention

Most people with acute low back pain respond rapidly to treatment; 90% are symptom-free within 1 to 2 weeks. Many of the remaining 10% recover within 3 months. A positive mental attitude, regular activity, and a prompt return to work are all very important elements of this recovery. If regular job duties cannot be performed initially, it is in the patient's best interest to return to some kind of modified (light or restricted) duty. Your health care provider can give prescriptions for such activity for limited periods of time.

Recurrences of back pain are common. The key to avoiding recurrence is prevention:

- Proper lifting techniques
- Good posture during sitting, standing, moving, and sleeping
- Appropriate exercise program
- An ergonomic work area
- Healthy weight and lean body mass
- A positive attitude and relaxation techniques (e.g., stress management)
- No smoking

Healthy supporting muscles can help keep your spine in proper alignment, promote healing after injury, and relieve chronic symptoms. Strong, flexible muscles maintain good spine alignment, allow movement, and provide structural support. When back pain does occur, there are many options to aid in its diagnosis and treatment for each individual's needs.

### Sources & Links

If you have more questions, please contact the Mayfield Spine Institute at 800-325-7787 or 513-221-1100. Additional information is available on the web.

### Links

[www.spine-health.com](http://www.spine-health.com)  
[www.neurosurgerytoday.org](http://www.neurosurgerytoday.org)  
[www.allaboutbackandneckpain.com](http://www.allaboutbackandneckpain.com)  
[www.spineuniverse.com](http://www.spineuniverse.com)

### Glossary

**acute:** a condition of quick onset lasting a short time, opposite of chronic.

**arthritis:** joint inflammation caused by infection, immune deficiency (rheumatoid arthritis), or degeneration of the cartilage that causes pain, swelling, redness, warmth, and restricted movement.

**chronic:** a condition of slow progression and continuing over a long period of time, opposite of acute.

**disc** (intervertebral disc): a fibrous cushion that separates spinal vertebrae. Has two parts, a soft gel-like center called the nucleus and a tough fibrous outer wall called the annulus.

**osteoporosis:** loss of bone or atrophy of skeletal tissue that causes bones to weaken and become brittle, and prone to fracture. Preventive measures include adequate calcium and regular exercise to stimulate bone metabolism.

**radiculopathy:** refers to any disease affecting the spinal nerve roots. Also used to describe pain along the sciatic nerve that radiates down the leg.

**sciatica:** pain that courses along the sciatic nerve in the buttocks and down the legs. Usually caused by compression of the 5<sup>th</sup> lumbar spinal nerve.

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