

Leg Pain (Sciatica) basic level

Overview

Sciatica is a term used to describe leg pain that radiates from your back into your buttock, and down the back of your leg. It is a general term used to describe symptoms rather than an actual physical condition. Typically the pain is caused by pressure on the nerve roots in your lower back. Doctors often call it lumbar radiculopathy, meaning that the pain begins in the spinal nerve roots and "radiates" to your leg. Depending on the cause, acute sciatica 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 leg pain. Strong, flexible muscles help to promote a healthy back that maintains good alignment, allows movement, and provides structural support.

Anatomy of the back

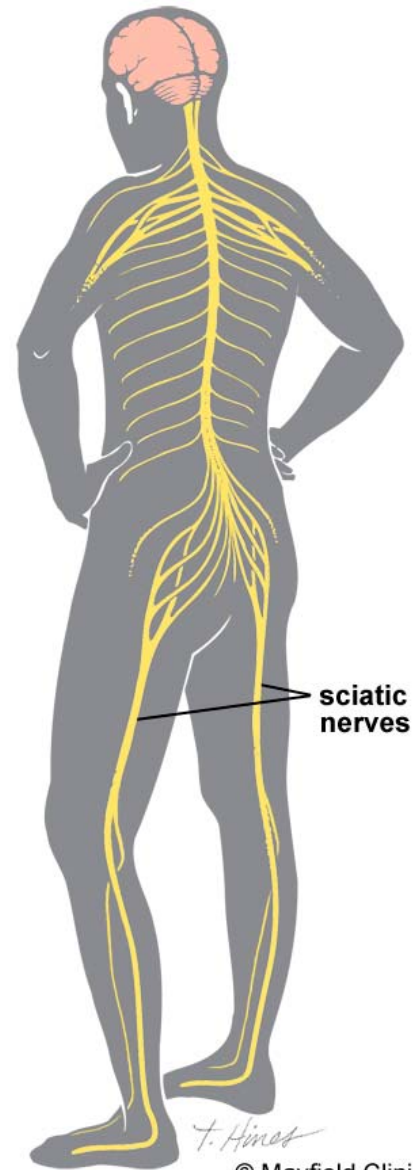
The sciatic nerve is formed from the spinal nerves in the lumbar and sacral regions of the spine (Fig. 1). The spinal nerves are numbered according to the vertebrae above which it exits the spinal canal. The spinal nerves L4 to S3 form the sciatic nerve. You have two sciatic nerves, one on each side, which travel through the pelvis and down the back of each leg where it divides into the peroneal and tibial nerves. This nerve provides feeling and motor control of your legs and feet (see Anatomy of the Spine).

Types of sciatic pain

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

Acute sciatic 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.

Chronic sciatic 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



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Figure 1. The sciatic nerve is the longest nerve of the body and is formed from spinal nerves L4 – S3. It supplies feeling and motor control of your legs and feet.

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 a pain management specialists (see Pain Management).

What are the symptoms?

Classic sciatic pain affects one leg, starts in the low back and buttocks, travels down the back of the thigh, past the knee to the foot. The leg pain is worse than the back pain. Your pain may range in intensity from mildly annoying to severe. It's often described as pressure or burning pain, and some people even experience shooting pain. You may also feel numbness or tingling (pins-and-needles) in your leg and foot, which usually is not a cause for concern unless you have weakness in your leg muscles.

Sitting usually causes the most pain because in this position your discs have more weight on them. Activities such as bending or twisting usually make your pain worse, and lying down tends to relieve the pain. You may actually feel better if you walk or run rather than sit or stand for too long.

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?

There are several possible causes of sciatic pain and they all stem from compression or irritation of the sciatic nerve roots.

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.

Stenosis: Narrowing of the spinal canal and nerve root canals 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.

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.

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

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 leg pain.

ligaments predisposes the vertebra to slip out of normal position.

Leg pain can also be caused by a joint problem (e.g., arthritis) in the hip or sacroiliac joint. This type of pain (called referred pain) is quite common, but is not sciatica. Diagnosing the correct problem is important because the treatments for each type of pain may differ.

How is a diagnosis made?

A careful medical examination will attempt to determine the type of spine 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).

Tests that check your muscle strength and reflexes can be used to confirm the presence of sciatica by attempting to reproduce the discomfort with certain motions and body positions.

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/leg 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 future re-injury.

Self care: Sciatica typically 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.

Medication: Your doctor may prescribe nonsteroidal anti-inflammatory drugs (aspirin, 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 sciatic 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, cauda equina syndrome, or if the pain is severe and not resolved after a reasonable course of nonsurgical treatment. Surgery for a herniated disc, called a discectomy, removes the portion of the disc compressing the spinal nerve. People with lumbar stenosis and a history of sciatica may benefit from a lumbar laminectomy to decompress the spinal nerves (see Spinal Decompression).

Recovery and prevention

Most people with acute sciatica respond rapidly to treatment. 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 sciatica 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

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
www.neurosurgerytoday.org
www.allaboutbackandneckpain.com
www.spineuniverse.com

Glossary

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

cauda equina syndrome: compression of the end of the spinal cord (cauda equina) causing low back pain, numbness in the saddle area (groin), extreme leg weakness, difficulty controlling bladder or bowel function; an emergency condition – if left untreated can cause paralysis.

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

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

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

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