Low Back Pain and Sciatica

What Are Low Back Pain And Sciatica?

The Spine

The spine is a column of small bones, or ***vertebrae,*** that support the entire upper body. The column is grouped into three sections of vertebrae:

- The ***cervical*** (C) vertebrae are the seven spinal bones that support the neck.
- The ***thoracic*** (T) vertebrae are the twelve spinal bones that connect to the rib cage.
- The ***lumbar*** (L) vertebrae are the five lowest and largest bones of the spinal column. Most of the body's weight and stress falls on the lumbar vertebrae.
- Below the lumbar region is the ***sacrum***, a shield-shaped bony structure that connects with the pelvis at the sacroiliac joints.
- At the end of the sacrum are two to four tiny, partially fused vertebrae known as the ***coccyx*** or "tail bone."

Each vertebra can be designated by using a letter and number; the letter reflects the region (C=cervical, T=thoracic, and L=lumbar) and the number signifies its location within that region. For example, C4 is the fourth bone down in the cervical region and T8 is the eighth thoracic vertebrae.

Vertebrae. Vertebrae in the spinal column are separated from each other by small cushions of cartilage known as ***intervertebral discs*** **.** Inside each disc is a jelly-like substance called the ***nucleus pulposus*** , which is surrounded by a fibrous structure called the ***annulus***. The disc is 80% water, which makes it very elastic. It has no blood supply of its own, however, but relies on nearby blood vessels to keep it nourished.

Processes. Each vertebra in the spine has a number of bony projections, known as ***processes***. The spinal and transverse processes attach to the muscles in the back and act like little levers, allowing the spine to twist or bend. The particular processes form the joints between the vertebrae themselves, meeting together and interlocking at the ***facet joints*** **.**

Spinal Canal. Each vertebra and its processes surround and protect an arch-shaped central opening. These arches, aligned to run down the spine, form the spinal canal, which encloses the spinal cord.

Spinal Cord. The spinal cord is the central trunk of nerves that connects the brain with the rest of the body. Each nerve root passes from the spinal column to other parts of the body through small openings bounded on one side by the disc and the other by the facets. When the spinal cord reaches the lumbar region, it splits into four bundled strands of nerve roots called the cauda equina (meaning horsetail in Latin).

Low Back Pain

Low back pain is usually defined as either ***acute*** or ***chronic***.

- Acute low back pain lasts less than a month and is not caused by serious medical conditions. Most cases clear up in a few days without medical attention, although recurrence after a first attack is common.

- Chronic low back pain persists beyond six months. It constitutes only 1% to 5% of all low back pain cases.

Back pain may be triggered by various problems that occur along the ridge of bone and disc and stretch or pinch nerves within the spinal column:

- Injuries and small fractures can occur.
- Muscle spasms can cause pain.
- Pressure on a weakened disc may cause it to rupture so the nucleus pulposus protrudes out from the spinal column, a condition known as a ***herniated disc .***
- The facets can become misaligned or deteriorate.
- The spinal canal itself can become narrowed, a disorder called ***spinal stenosi*** *s*.

Sciatica

The sciatic nerve is the one most likely to be affected in low back pain. At some time, up to 40% of people experience this pain, known as ***sciatica***. The sciatic nerve has an extensive pathway:

- It first branches from the nerve roots that descend off the lowest part of the spinal cord (in the lumbar and sacral areas). Each of the two branches of the sciatic nerve is about as wide as a thumb.
- Each threads through the pelvis and deep into either side of the buttocks.
- Each then passes down the hip and along the back of the thigh to the foot.

A herniated disc pressing on the sciatic nerve is the most common cause of this problem, although it can also occur from spinal stenosis or other vertebral abnormalities.

Symptoms of Sciatica. The sensation of sciatica can vary widely, from a mild tingling to pain severe enough to cause immobility. It most often occurs on one side. Some people experience sharp pain in one part of the leg or hip and numbness in other parts. The pain increases after prolonged standing or sitting and is aggravated by sneezing, coughing, or laughing. If spinal stenosis is causing sciatica, patients may also experience it after bending backwards or walking more than 50 to 100 yards.

What Causes The Pain In Low Back Pain Or Sciatica?

Herniated Disc and Other Disc Abnormalities

Back pain most often occurs because of a pinched (***impinged***) nerve, most often the sciatic nerve. The most common reason for this pinched nerve is disc herniation. Other disc problems can cause this pain.

Herniated Disc. A herniated disc, sometimes, but incorrectly, called a slipped disc, is the most common cause of severe back pain and sciatica. A disc in the lumbar area becomes herniated when it ruptures or thins out and degenerates to the point that the gelatin within the disc protrudes outward. Classic low back pain occurs if this material *extrudes* (that is, it balloons into the area outside the vertebrae or breaks off from the disc) far enough out to press against the nerve root.

It should be noted, that as people age, disc bulging and protrusion is very common and in most cases does not cause any back pain. Discs might also swell in response to stress and then contract again without causing problems. On the other hand, sciatica pain is sometimes present

when there is no bulging or extruding of the discs.

Tear in the Annular Ring. Sometimes rupture can occur from a tear in the *annular ring* (the fibrous band that surrounds and protects the disc. This can occur after sitting for long periods, from impact, or after suddenly bending over.

Cauda Equina Syndrome . Cauda equina syndrome is the impingement of the cauda equina (the four strands of nerves leading through the lowest part of the spine) and can have severe complications in the bowel or bladder. It is an emergency condition. It is usually caused by massive extrusion of the nucleus pulposus.

Lumbar Degenerative Disc Disease. Degeneration of the disc over time produces low-grade inflammation and irritation and is the major cause of chronic low back pain.

Inward Nerve Growth. Some cases of chronic low back pain may be caused by inward growth of nerve fibers into intervertebral discs, and some evidence exists that nerves in the annular ring may be a source of pain.

Spinal Stenosis

Spinal stenosis is the narrowing of the spinal canal. This typically develops as a person ages and the discs become drier and start to shrink. At some point in this process, any disruption, such as a minor injury that results in disc inflammation, can cause impingement on the nerve root and trigger pain. Pain from spinal stenosis can occur in both legs or can cause sciatic pain. Spinal stenosis occurs mostly in the elderly with degenerative osteoarthritis, but it can sometimes be caused by other problems, including infection and birth defects.

Miscellaneous Abnormalities in the Vertebrae, Facet Joints, or Both

A number of conditions that affect the joints and vertebrae can cause back pain:

- ***Spondylolisthesis*** is a condition in which one vertebra has slipped forward over the other. This is also a cause of sciatica.
- The facet joints can wear down. In such cases, pain occurs on arching the back or when walking.
- In some cases a segment (consisting of two vertebra and their common joint and disc) becomes unstable when its parts wear down.

Piriformis Syndrome

Some experts believe that one cause of sciatica pain is the entrapment of the sciatic nerve deep in the buttock by the *piriformis* muscle. It usually develops after an injury. Others believe there is no real evidence that this condition, known as piriformis syndrome, causes any sciatic pain.

What Conditions Make People Susceptible To Low Back Pain?

In most known cases, pain begins with an injury, after lifting a heavy object, or after making an abrupt movement. A number of conditions may make people more or less susceptible to low back pain from such events. In 85% of back pain cases, the causes are unknown.

Aging Process

Intervertebral discs begin deteriorating and growing thinner by age 30. One-third of adults over 20 show evidence of herniated discs (although only 3% of these discs cause symptoms). As people continue to age and the discs lose moisture and shrink, the risk for spinal stenosis increases. The incidence of low back pain and sciatica increase in women at the time of menopause as they lose bone density. In the older adults, osteoporosis and osteoarthritis are also common. However, the risk for low back pain does not mount steadily with ever-increasing age, which suggests that at a certain point, the conditions causing low back pain plateau.

Genetic Factors

Many people have a genetic susceptibility to low back pain, usually from inheriting spinal structural abnormalities. A 1999 study suggests that a specific mutation of the COL9A2 gene may be linked to about 10% of sciatica cases. The gene plays a role in producing collagen, the protein building block in all structural tissue in the body. The defective gene may cause disc deterioration leading to sciatica.

Osteoarthritis

Osteoarthritis occurs in joints where cartilage is damaged and then destroyed. In reaction to this destruction, the bones associated with the joints develop abnormalities. (Rheumatoid arthritis, which is an arthritic condition caused by inflammation in the joints, can damage joints throughout the body, but rarely affects the lower back.) When osteoarthritis affects the spine, it may damage the cartilage in the discs, the moving joints of the spine, or both. The nerves may become pinched, causing pain and in advanced cases, numbness and muscle weakness. The patient may also experience muscle spasms and diminished mobility.

Psychologic and Social Factors

Psychological factors are known to play a strong influential role in three phases of low back pain:

- *Onset of pain.* Although disc abnormalities are certainly a cause of low back pain, many people with disc rupture or tears do not experience back pain. And some people without disc abnormalities complain of back pain. Research now indicates that in many people, preexisting depression and the inability to cope may be more likely to predict the onset of pain than physical abnormalities.
- *The perception of pain.* Social and psychologic factors play a role in how severely someone experiences pain. People who are depressed are more likely to have vague physical symptoms, including low back pain. For example, in one study of truck drivers and bus drivers, nearly all the truck drivers liked their work and their bosses while bus drivers reported much lower job satisfaction. Half the truck drivers reported low back pain but only 24% lost time at work. Bus drivers with back pain had a significantly higher absentee rate in spite of less stress on their backs. Similarly, another study found that pilots (who generally reported "loving" their jobs) reported far fewer back problems than their flight crews. And yet another study reported that low rank, low social support, and high stress in soldiers was associated with a higher risk for disabling back pain.
- *Chronic pain.* The way a patient perceives and copes with pain at the beginning of an acute attack may actually condition the patient to either recover or develop a chronic condition. Those who over-respond to pain tend to feel out of control and become discouraged, increasing their risk for long-term problems. One study, in fact, reported that in patients with existing back problems, the fear of pain was actually more disabling than the pain itself.

It should be strongly noted that the presence of psychological factors in no way diminishes the reality of the pain and its disabling effects. Recognizing it as a strong player in many cases of low back pain, however, can help determine the a full range of treatment options.

Pregnancy

Pregnant women are prone to back pain due to a shifting of abdominal organs, the forward redistribution of body weight, and the loosening of ligaments in the pelvic area as the body prepares for delivery. Tall people are at higher risk than short people.

Osteoporosis

Osteoporosis is a disease of the skeleton in which the amount of calcium present in the bones slowly decreases to the point where the bones become fragile and prone to fracture. It usually does not cause pain unless the vertebrae collapse suddenly, when pain is often severe. Studies indicate, however, that the incidence of low back pain and sciatica increase around the time of menopause, and very tiny fractures in the vertebrae caused by osteoporosis may be an undetected cause of back pain in many elderly women.

Infections

Infections are a common cause of back pain. Osteomyelitis is infection in the spine, a rare cause of back pain. Other infections that cause back pain include Lyme disease, septic arthritis, bacterial endocarditis, Reiter's syndrome, mycobacterial and fungal arthritis, and viral arthritis. Chronic uterine or pelvic infections can cause low back pain in women.

Atherosclerosis

Atherosclerosis (commonly called hardening of the arteries) reduces blood supply in the arteries. Although mainly known as a cause of heart disease, atherosclerosis can also reduce the supply of blood to the back and cause chronic low back pain. When it blocks arteries in the legs (a condition called intermittent claudication) it may resemble sciatica.

Ankylosing Spondylitis

Ankylosing spondylitis is a chronic inflammation of the spine that may gradually result in a fusion of the spine. Symptoms include a slow development of back discomfort, with pain lasting for more than three months. The back is usually stiff in the morning; pain improves with exercise. In severe cases, patient must continually stoop over. It can be quite mild, however, and it rarely affects a person's ability to work. It occurs mostly in young Caucasians in their mid-twenties. The disease is more common in men, but about 30% of the cases are in women. Researchers believe that in most cases it is hereditary. About 20% of people with inflammatory bowel disease and about 20% of people with psoriasis develop a form of ankylosing spondylitis.

Muscular Abnormalities

Some research is suggesting that some people have motor control abnormalities in the deep muscles near the spine. Such lack of control causes instability in the spine that can lead to pain.

Other Medical Conditions

Sometimes back pain can be caused by problems in other organs, usually near the spine, which is then called referred pain. These conditions can include ulcers, kidney disease (including kidney stones), ovarian cysts, and pancreatitis. Inflammatory bowel disease and rheumatoid arthritis can produce inflammation in the spine (***sacroiliitis***). Back pain can also be due to abscesses, blood clots, and cancer. Fibromyalgia (also called fibrositis or fibromyositis) is a syndrome that causes chronic, sometimes debilitating muscle pain and fatigue. In older people, low back pain may be a sign of Paget's disease or Parkinson's. [For more information see *Fibromyalgia.*]

Medications

Medications may trigger back pain. For example, anticoagulants can cause bleeding or an internal bruise. Long-term steroid use can cause infection or compression fractures.

Conditions that Cause Back Pain Children

Persistent low back pain in children is more likely to have a serious cause that requires treatment than back pain in adults. According to one small study, one third of children being treated at a hospital for back pain were found to have serious underlying problems. Among the condition that cause back pain in children are the following:

- Spondylolytis are stress fractures in the spine. They are a common cause of back pain in young athletes. (Sometimes a fracture may not show up for a week or two after an injury.)
- Hyperlordosis is an inborn exaggerated inward curve in the lumbar area. (Scoliosis, an abnormal curvature of the spine in children, does not usually cause back pain.)
- Injuries.
- Benign Tumors (eg, osteoblastoma or neurofibroma).
- Cancers, including leukemia.
- Juvenile chronic arthropathy. This is an inherited form of arthritis that can cause pain in the sacrum and hip joints of children and young people. It used to be grouped under juvenile rheumatoid arthritis but is now defined as a separate problem.

What Are The Lifestyle Risk Factors For Low Back Pain?

Recent estimates suggest that 18% of American adults have experienced frequent low back pain episodes in the last year, and 15% had an episode lasting over a month. It is the second most common reason for visiting a physician. About 85% of everyone under age 50 has had back pain at least once. In its costs to the country, it is second only to cancer and heart disease.

High-Risk Occupations

In one study, 16 out of 100 warehouse workers reported back injuries in one year, and in two major food service organizations 30% of all injuries involved the back. A major study of work-related injuries reported that, in 1994, there were nearly 330,000 cases of back injury due to overexertion in handling objects.

Jobs that involve lifting and forceful movements, bending and twisting into awkward positions, and whole-body vibration (usually caused by long-distance truck driving) place workers at particular risk for low back pain. The longer a person is on such jobs, the higher the risk. Some workers wear back support belts, but evidence strongly suggests that are useful only for people who are currently suffering from low back pain. They offer little added support for the back and do

not prevent back injuries. In fact, in one study workers who wore the belt for prevention reported more back pain than the workers who didn't wear them.

A number of companies are developing programs to protect against back injuries. Although studies are mixed on the effects of company interventions, one analysis suggested that they do have a positive effect. Employers and workers, however, should make every effort to create a safe working environment. Office workers should have chairs, desks, and equipment that support the back or help maintain good posture.

Improper or Intense Exercise

On the other side of the coin, improper or excessive exercise is also an important risk factor for back pain.

- The effect of high-impact exercise on the back is not entirely clear. Some research suggests that over time, it may increase the risk for degenerative disc disease. A survey of people who played tennis, however, found no increased risk for low back pain or sciatica.
- Between 30% and 70% of cyclists experience low back pain. (One 1999 study reported that 70% of cyclists reported improvement simply by adjusting the angle of the bicycle seat.)
- Improper exercise instruction and inattention to mechanics can be sources of sudden trouble. As examples, a single jerky golf swing or incorrect use of exercise equipment (especially free weights, nautilus, and rowing machines) can cause serious back injuries.

Sedentary Lifestyle

People who do not exercise regularly face an increased risk for low back pain, especially during times when they suddenly embark on stressful unaccustomed activity, such as shoveling, digging, or moving heavy items. Although no definitive studies have been done to prove the relationship between lack of exercise and low back pain, sedentary living is probably a primary nonmedical culprit contributing to this condition. Lack of exercise leads to the following conditions that may threaten the back:

- Muscle inflexibility (can restrict the back's ability to move, rotate, and bend).
- Weak stomach muscles (can increase the strain on the back and can cause an abnormal tilt of the pelvis).
- Weak back muscles (may increase the load on the spine and the risk for disc compression).
- Obesity, associated with sedentary lifestyle (may puts more weight on the spine and increases pressure on the vertebrae and discs). Studies report only a weak association between obesity and low back pain, however.

Risk Factors for Back Pain in Children and Adolescents

The likelihood of experiencing back pain increases as children age, and pain is more common among girls than boys, according to a 1999 study. A common cause of temporary back pain is carrying backpacks that are too heavy for children (more than 20% of their body weight, or even less for very young children).

Other Risk Factors

Smokers are at higher risk for back problems, perhaps because smoking decreases blood circulation, but the association may also be due to an unhealthy lifestyle in general.

How Serious Is Low Back Pain Or Sciatica?

Symptoms of Cauda Equina Syndrome

Cauda equina syndrome can cause permanent incontinence if not promptly treated with surgery. Symptoms of the syndrome include the following:

- Dull back pain.
- Weakness or numbness in buttocks, genital area, or thigh.
- An inability to control urination or defecation. Pain accompanied by fever can indicate an infection.

Warning Signs for Serious Underlying Problems

Certain warning signs should alert a patient to see a physician immediately for low back pain. Any very severe back pain warrants attention, particularly if any of the following conditions are present:

- Being over 50.
- Recent injury.
- Severe pain.
- Pain awakens the person at night.
- Pain accompanied by fever (possible infection).
- Pain increased by lying down.
- Pain unrelated to movement.
- Pain lasts for a month, and is accompanied by unexplained fever or weight loss. (Possible indication of a tumor particularly in people with a history of cancer).
- History or chronic use of corticosteroids.
- Intravenous drug use.
- History of urinary tract infection.
- In children, any severe neck or back pain or pain that persists for more than three days.

Long-Term Outlook

Although most reports estimate that 90% of back pain cases resolve with in three months with minimal treatment, some research suggests that up to 25% of back pain victims may continue to have symptoms after a year.

Recurrence, in any case, is common after a first episode of back pain. In one survey, over a one-year period following treatment only 21% of patients had no recurring back pain. Over four years, less than half were symptom-free.

Researchers attempted to identify factors most likely to predict an elevated risk for recurrent pain and found that only depression was a significant factor in the majority of those who had not recovered.

Effects on Work

Low back pain costs the US as much as $14 billion in lost productivity each year. Chronic back pain has become one of the most expensive causes of disability among workers under the age of 45. One study found that although severe back pain comprised only 10% of workers compensation cases it accounted for 86% of compensation costs. Studies have found that when people stay home because of back injury, only 65% are back within a week and nearly 14% are still absent at one month. And, if someone is on disability for a year or longer for low back pain, there is only a 25% chance that the patient will return to work.

How Is Low Back Pain Or Sciatica Diagnosed?

Medical History and Physical Examination

Because nearly all cases of low back pain clear up in a short time and are not due to serious problems, a medical history and a brief physical examination are almost always sufficient. The physician should check for any medical conditions that might be causing low back pain.

Medical History. A medical and family history should include heart problems, cancer, arthritis, and any other serious conditions. The patient should report previous episodes of back pain as well as any history of injuries or accidents involving the neck, back, or hips. The physician will generally ask about frequency, duration, and the nature of the pain (eg, whether it is dull, piercing, throbbing, or burning). The patient should describe its onset, if possible, and whether the pain was triggered by an event, such as lifting a heavy object. (Often, the patient cannot describe an event that produced the pain.) The physician will need to know what worsens the pain (for example, coughing, exercise, straining during bowel movements, walking) and what relieves the pain (lying down, exercise). Other important symptoms may include morning stiffness, problems with urination or defecation, and weakness or numbness in the legs.

Physical Examination. Most patients with low back pain find that it gets worse during movement and prolonged sitting or standing. The main objective of a physical examination is to locate the specific source of the pain:

- Patients are asked to sit, stand, and walk in different ways (flat-footed, on the toes, and on their heels). In some cases they are asked to walk on a treadmill to test for weakness in toe or heel walking (which may indicated stenosis).
- Patients will be requested to bend forward, backward, and sideways and to twist.
- Patients will be asked to lift their leg straight up while lying down. The physician will also move the patient's legs in different positions and bend and straighten the knees. (Pain caused by sciatica is usually sharp, localized, and accompanied by numbness or tingling. It can be intensified by lifting the affected leg straight in the air. Pain caused by inflammation is duller and more generalized and not affected by lifting a straight leg.)
- The circumference of the calves and thighs may be measured to look for muscle deterioration.
- To test nerve function and reflexes, physicians will tap the knees and ankles with a rubber hammer. The physician may also touch parts of the body lightly with a pin, cotton swab, or feather to test for numbness and nerve sensitivity.

Imaging Techniques

Imaging techniques such as x-rays or scans are rarely used except under certain circumstances that may include the following:

- Pain that lasts more than a month.
- Very severe pain, numbness.

- Muscle weakness.
- Accidents that might involve the vertebrae.
- A history of cancer.
- The presence of fever.

If these conditions exist, usually an x-ray is used first, and then, if results are inconclusive, either a computed tomography (CT) or magnetic resonance imaging (MRI) scan. (Ultrasound is not useful.)

X-Rays. A plain x-ray is usually not very helpful, but it can aid in ruling out infection, injuries, or tumors. It may also reveal signs of stenosis and changes in the spine due to aging.

A ***discography*** is an x-ray of the disc. It requires injections into discs suspected of being the source of pain and discs nearby. It can be painful and is generally used for patients who are undergoing back surgery to identify the location of the injured disc. Some experts believe that discography is not at all useful in identifying the source of pain because it requires expert execution and analysis for any degree of accuracy. Others argue that it is the only procedure that can reveal the shape of the disc and identify nerve structures in the disc, which may play a role in some cases of sciatica.

A ***myelogram*** is an x-ray of the spine that requires a spinal injection and the need to lie still for several hours to avoid a very painful headache. It has largely been replaced by CT and MRI scans.

CT and MRI Scans. MRI and CT scans are often used for identifying disc abnormalities. MRIs are more accurate than CTs and provide very well-defined images of soft tissue and bone. MRIs are able to detect annular tears or disc fragments and can detect nonspinal causes of back pain, including infection and cancer. Still, studies have reported that MRIs miss between 6% and 23% of damaged discs that were revealed during surgery. Spinal abnormalities identified by MRIs also predict long-term problems. Three-dimensional CT scans and MRI refinements may soon make diagnosis more accurate.

These techniques are not painful, but they are very expensive. Furthermore, evidence now strongly suggests that an image of an abnormal disc is not necessarily an indication for surgery. For example studies indicate at least 40% of all adults have bulging or protruding vertebrae discs. And most have no back pain at all. Discs abnormalities in people who have back pain, then, may simply be a coincidence rather than an indication for treatment. Many experts now believe that relying on images of disc abnormalities to determine treatment has resulted in many unnecessary surgeries.

Bone Scans and SPECT Imaging. Bone scintigraphy and single photon emission computed tomography (SPECT) may also be used, especially if bone abnormalities are suspected from conditions that include spinal fracture, cancer that has spread to the bone, or osteoarthritis.

Other Tests

Blood and urine samples may be used to test for infections, arthritis, or other conditions. Injecting a drug that blocks pain into the nerves in the back helps locate the level in the spine where problems occur. A procedure called a facet block is also useful in locating areas of specific damage. Provocative discometry is a test that uses an injection of saline solution into the suspected disc to reproduce the pain, which is then followed by injection of an anesthetic to dull the pain.

General Guidelines For Preventing And Treating Low Back Pain

Treating Uncomplicated Acute Low-Back Pain

The general approach for treating short-term acute low back pain is to do almost nothing out of the ordinary. Bed rest is no longer recommended and studies are reporting that the best results derive from the least aggressive treatments. When low back pain is not caused by a medical condition, about 90% of people recover within a month without any treatment at all. Nevertheless, studies indicate that uncomplicated low back pain is still being over-treated. One 1999 study reported that 38% of patients with uncomplicated back pain received painkillers containing narcotics and over 60% were prescribed expensive nonsteroidal anti-inflammatory drugs. Over 60% received physical therapy, some using techniques with no proven effectiveness.

Treatment for Chronic or Severe Low Back Pain

Treatment for severe back pain is available from a variety of health care practitioners, including primary care practitioners, chiropractors, and orthopedic surgeons. It should be noted that for certain patients with sciatica and spinal stenosis, more aggressive treatments, including possibly surgery, may still be an appropriate approach.

Treating Medical Causes of Back Pain

Back pain attributed to medical conditions, such as arthritis, osteoporosis, or pregnancy, either resolves when the condition does or is treated as part of the overall therapeutic plan.

What Are Standard Treatments For Uncomplicated Acute Low Back Pain Or Sciatica?

Immediate Treatment of Acute Low Back Pain

At the onset of acute low back pain, the following tips may be helpful:

- The patient should take an over-the-counter pain reliever and lie down in a comfortable position.
- Many people find that alternating ice packs and heating pads is helpful in relieving the pain. Some people recommend changing from hot to cold every three minutes and repeating this sequence three times. (Some experts believe ice packs should be applied first.) This regimen should be performed two or three times during the day. (Heat or cold treatments do not have much effect on sciatica.)
- Supportive back belts, braces, or corsets may help some people temporarily, but they can reduce muscle tone over time and should be used only briefly.
- Bed rest for longer than a couple of days is no longer recommended. In fact, bed rest for low back pain, including most cases of sciatica, is no more effective and may even be worse than simply continuing normal activities to the degree possible. Long-term bed rest results in loss of muscle tone and bone strength, increases susceptibility to blood clots, and causes depression and lethargy.
- Although bed rest is no longer recommended, healthy sleep plays a vital role in recovery. It is often difficult to get a good night's sleep when suffering from back pain, particularly

because the pain can intensify at night. Lying curled up in a fetal position with a the pillow between the knees or lying on the back with a pillow under the knees may help. Pregnant women with back pain may find some relief by placing a specially shaped pillow (eg, Ozzlo Pillow) under the abdomen while sleeping.
- To help promote sleep, avoid caffeine in the afternoon and evening, take a warm bath before bedtime, and practice relaxation techniques. It may be necessary to take medication to help manage nighttime pain or treat sleeplessness.

Resuming Normal Activity

Experts now recommend that people with acute low back pain attempt to resume normal activities as soon as possible. They should be conducted without strain or stretching. Simply letting pain be the guide is the best approach for achieving movement. In general, normal activity should be resumed in a gradual fashion as soon as the patient feels ready, reserving therapeutic exercises until after the acute pain has resolved.

Spinal Manipulation

Spinal Manipulation for Uncomplicated Acute Low Back Pain. Experts now recognize that at least one spinal manipulation within the first four weeks of the onset of uncomplicated acute back pain may be a useful treatment. Controversy exists over whether on-going manipulations after a first visit work any better for relieving pain than leaving the back alone and gradually resuming normal activity. There are a number of variations, but one example of a spinal manipulation technique is the following:

- The patient first lies on his or her side.
- The practitioner grasps the exposed shoulder and either the hip or knee and then presses the upper and lower portions of the body in opposite directions, so that the torso rotates.
- The shifting vertebrae make a cracking or popping sound, indicating that it has exceeded the normal range of motion.
- Often this results in a greater sense of ease and mobility. (The effect, however, may be temporary).

Some patients consider spinal manipulation to be highly effective for chronic low back pain as well, although evidence in this case is much weaker. Methodological problems have clouded the results of many studies on manipulation techniques, and it is difficult to draw valid conclusions from most of them.

Chiropractic or Osteopathy. Spinal manipulations are typically performed by chiropractors but osteopathic doctors also perform them.

- One in three people with low back pain seek treatment from a chiropractor. Chiropractic was founded in the US in the late 1800s and has been associated throughout its history with shamanism and folklore as well as with potentially genuine health benefits. There has not been a clear consensus even among its own practitioners about its specific goals. Nevertheless, there is a strong movement within the practice aimed at a scientific and realistic approach. The specific goal of chiropractors is to perform spinal manipulations to improve nerve transmission. Many studies have now confirmed that patients feel more satisfied with their chiropractic care than with treatment from general practitioners. (An analysis of studies reported that chiropractic treatment was beneficial but not significantly better than sham treatments. Interestingly, standard medical treatments had *worse* results than both chiropractic and sham treatments.)

- Osteopathy was also found in the 1800s and also involves physical manipulation as its core approach to healing. Unlike chiropracty, however, osteopathy uses manipulation of the bones, muscles, and tendons to optimize blood circulation. In addition, the general direction of osteopathy over the years has widened to employ a broader range of treatments that now approach those of standard medicine. One 1999 study reported that osteopaths were as effect as medical doctors in treating low back pain and their patients required far less medication and physical therapy. Osteopathic treatment was also far less expensive.

Positive Emotional Effects. Both chiropractors and osteopaths offer verbal assurance and a precise treatment regimen. The direct physical connection through spinal manipulation reinforces the patient-practitioner relationship. The emotional effects of such connections may be as important for healing as the treatments themselves. Chiropractors offer a further psychologic advantage, availability. Many medical doctors believe that because low back pain is self-limited and resolves, the patient can wait for an appointment. A chiropractor, however, is more likely to accept to a patient promptly.

Adverse Effects. The potential for adverse effects from low back manipulations is low, although serious complications have been reported with manipulations of the neck, which should be avoided. In addition, some chiropractors overuse x-rays, particularly those of the full spine, which may have harmful consequences. Patients should also be aware that some chiropractors use alternative treatments that have not been proven or rigorously studied. All patients should require objective evidence on the benefits of their treatments.

Massage Therapy

Studies are mixed on the benefits of massage therapy for low back pain. To date, no strong studies have been conducted to verify its effects, but some have indicated it was as effective as spinal manipulation or electrical stimulation. In one 2000 study, patients who received comprehensive massage therapy (soft tissue massage, remedial exercise and posture training) improved significantly more than patients who received only exercise and posture therapy or no therapy at all.

What Is The Role Of Exercise And Movement In Low Back Pain?

Resuming Activity Levels after Acute Back Pain

Overexertion may be as unhelpful as prolonged bed rest during acute back pain. (In one study, recovery from acute back pain was slower for patients who immediately embarked on flexibility exercises than for those who gradually resumed normal activity.) Walking, stationary biking, swimming, and even light jogging, however, may begin within two weeks of symptoms. An incremental aerobic exercise program is less stressful than stretching or exercises strengthening the trunk muscles. Patients should never force themselves to exercise if, by doing so, pain increases.

Exercises to Avoid during Recovery

It should be strongly noted that incorrect movements or long-term high-impact exercise is a cause of back pain. People vulnerable to back pain should avoid activities that put undue stress on the lower back or require sudden twisting movements, such as football, golf, ballet, and weight lifting.

Jogging is usually not recommended, at least not until the pain is gone and muscles are stronger. Exercises that put the lower back under pressure should be avoided until the back muscles are well toned. Such exercises include leg lifts done in a prone (face-down) position, straight leg sit-ups, and leg curls using exercise equipment.

Exercise for Chronic Back Pain

Exercise plays a very beneficial role in chronic back pain. In one study, for example, patients with back pain lasting for an average of 18 months were assigned eight one-hour exercise sessions over four weeks. They showed greater improvement in nearly every area, including reduced pain and increased capacity, compared to patients who did not exercise. Patients who choose a passive route (massage and heat therapy) experience slower recovery from pain than those who exercise (although after a year their conditions do not appear to differ much). Some studies suggest that the positive impact of exercise on low back pain does not depend on improving strength and flexibility but on changing the patients' attitudes toward their disability and pain. Some exercise programs used for prevention or for chronic low back pain include the following:

- *Low Impact Aerobic Exercises.* Low-impact aerobic exercises, such as swimming, bicycling, and walking, can strengthen muscles in the abdomen and back without over-straining the back. Programs that use strengthening exercises while swimming may be a particularly beneficial approach for many patients with back pain.
- *Lumbar Extension Strength Training.* Exercises called lumbar extension strength training are proving to be effective. Generally, these exercises attempt to strengthen the abdomen, improve lower back mobility, strength, and endurance, and enhance flexibility in the hip and hamstring muscles and tendons at the back of the thigh. [For examples of some good exercises for the back, *see Box.*]
- *Yoga, Tai Chi, and Chi Kung.* These exercises combine low-impact physical movements and meditation. They are based on principles of disciplining the mind to achieve a physical and mental balance and can be very helpful in preventing recurrences of lower back pain.
- *Flexibility Exercises.* Whether flexibility exercises alone offer any significant benefit is uncertain. One study suggested that any benefits derived from flexibility exercises are lost unless the exercise regimens are sustained.
- *Retraining Deep Muscles.* Of interest are studies that are finding a link between low back pain and impaired motor control of deep muscles of the back and trunk. According to these studies, contraction exercises specifically designed to retrain these muscles may be effective for patients with both acute and chronic pain.

It is important for any person who has low back pain to have an exercise program guided by professionals who understand the limitations and special needs of back pain and who can address individual health conditions. One study indicated that patients who planned their own exercise did worse than those in physical therapy or physician-directed programs.

Specific Exercises for Low Back Strength

Perform the following exercises at least three times a week:

Partial Sit-ups. Partial sit-ups or crunches strengthen the abdominal

muscles.

- Keep the knees bent and the lower back flat on the floor while raising the shoulders up three to six inches.
- Exhale on the way up and inhale on the way down.

Perform this exercise slowly eight to tens times with the arms across the chest.

Pelvic Tilt. The pelvic tilt alleviates tight or fatigued lower back muscles.

- Lie on the back with the knees bent and feet flat on the floor.
- Tighten the buttocks and abdomen so that they tip up slightly.
- Press the lower back to the floor, hold for one second and then relax.
- Be sure to breathe evenly.

Over time increase this exercise until it is held for five seconds. Then, extend the legs a little more so that the feet are further away from the body and try it again.

Stretching Lower-Back Muscles. The following are three exercises for stretching the lower back:

- Lie on the back with knees bent and legs together. Keeping arms at the sides, slowly roll the knees over to one side until totally relaxed. Hold this position for about 20 seconds (while breathing evenly) and then repeat on the other side.
- Lying on the back, hold one knee and push it gently toward the chest. Hold for 20 seconds. Repeat with other knee.
- While supported on hands and knees, lift and straighten right hand and left leg at the same time. Hold for three seconds while tightening the abdominal muscles. The back should be straight. Alternate with the other arm and leg and repeat on each side eight to 20 times.

Note: No one with low back pain should perform exercises that require bending over right after getting up in the morning. At that time, the discs are more fluid-filled and more vulnerable to pressure from this movement.

Tips for Daily Movement and Inactivity

The way a person moves, stands, or sleeps during the day plays a major role in back pain:

- Maintaining good posture is very important. This means keeping the ears, shoulders, and hips in a straight line with the head up and stomach pulled in.
- It is best not to stand for long periods of time. If it is necessary, walk as much as possible and wear shoes without heels, preferably with cushioned soles. Using a low stool, alternate resting each foot on it.
- Sitting puts the most pressure on the back. Chairs should either have straight backs or low-back support. If possible, chairs should swivel to avoid twisting at the waist, have arm rests, and adjustable backs. While sitting, the knees should be a little higher than the hip,

so a low stool or hassock is useful to put the feet on. A small pillow or rolled towel behind the lower back helps relieve pressure while either sitting or driving.
- Riding and particularly driving for long periods in a vehicle increases stress. Move the seat as far forward as possible to avoid bending forward. The back of the seat should be reclined not more than 30° and, if possible, the seat bottom should be tilted slightly up in front. For long rides, one should stop and walk around about every hour and avoid lifting or carrying objects immediately after the ride.
- Be sure to have a firm mattress. If the mattress is too soft, a 1/4-inch plywood board can be put between the mattress and box spring. On the other hand, some people have experienced morning backache from a mattress that is too hard. The back is the best guide.

Tips for Lifting and Bending

Anyone who engages in heavy lifting should take precautions when lifting and bending:

- If an object is too heavy or awkward, get help.
- Spread your feet apart to give a wide base of support.
- Stand as close as possible to the object being lifted.
- Bend at the knees; tighten stomach muscles and tuck buttocks in so that the pelvis is rolled under and the small of the back is flexed slightly. Do not arch the back. (Even when not lifting an object, always try to use this posture when stooping down).
- Hold objects close to the body to reduce the load on the back.
- Lift using the leg muscles, not those in the back.
- Stand up without bending forward from the waist.
- Never twist from the waist while bending or lifting any heavy object. If you need to move an object to one side, point your toes in that direction and pivot toward it.
- If an object can be moved without lifting, pull it, don't push.

What Are Treatments For Chronic Low Back Pain

Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

The most commonly prescribed medications for the treatment of chronic pain symptoms are the nonsteroidal anti-inflammatory drugs (NSAIDs), which include, among many others, aspirin, ibuprofen (Motrin, Advil, Nuprin, Rufen), and naproxen (Aleve, Naprosyn, Naprelan, Anaprox). It may take one or two weeks before patients begin to notice a reduction in pain. [For additional NSAIDs, *see Box* Ulcer Risk for NSAIDs *below*.]

Although NSAIDs can work very effectively against symptoms, they often trigger gastrointestinal problems such as upset stomachs, ulcers, and internal bleeding. NSAIDs reduce pain and inflammation by blocking an enzyme called cyclooxygenase (COX), which is involved in the production of prostaglandins. The COX enzyme has two functions: the COX-1 form protects the mucus lining while the COX-2 form causes intestinal contractions and inflammation. Because most NSAIDs reduce both COX-1 and COX-2, they relieve pain, but they also impair an important defense system in the intestine. Blocking prostaglandins can damage the mucous layer, lower bicarbonate levels, and reduce blood flow in the intestine. Each of these actions can increase the risk for ulcers and gastrointestinal bleeding. Even if an NSAID is injected intravenously, the drug will still inhibit prostaglandins in the stomach and duodenum. Ulcers form when the rate of damage inflicted by the NSAID exceeds the rate of repair conducted by the stomach. [*See Box* Ulcer Risk for Specific NSAIDs.]

NSAIDs can also increase blood pressure, particularly among people already being treated for

hypertension. About 12% to 15% of elderly people take both an NSAID and an antihypertensive drug. Piroxicam, naproxen, and indomethacin appear to pose the greatest risk of high blood pressure. Sulindac has the smallest effect.

Other side effects of NSAIDs include dizziness, ringing in the ears, headaches, skin rashes, and possibly depression. Studies have appeared suggesting that high doses of NSAIDs can damage cartilage, and there have also been reports that NSAIDs can cause kidney damage (which, however, resolves once the patient stops using the drug). People with high blood pressure, severe circulation disorders, or kidney or liver problems, as well as people taking diuretics or oral hypoglycemics, must be closely monitored if they need to use NSAIDs on a long-term basis. Because NSAIDs reduce blood clotting, NSAID users scheduled for surgery should stop taking those drugs a week before the operation.

Ulcer Risk for NSAIDs

Who's at Risk? In the US the effects of NSAIDs are responsible for more than 100,000 hospitalizations and 16,500 deaths each year. The elderly, smokers, and alcohol abusers are at particular risk for such complications. The risk for bleeding is continuous for as long as a patient is on these drugs and may even persist for about a year after taking them. Although short courses of NSAIDs for temporary pain relief should not cause major problems, of concern was a 1998 study indicating that taking NSAIDs for only six months posed a risk for symptomatic ulcers that was greater than 1%. Regular use of even over-the-counter NSAIDs may be hazardous in everyone.

One study ranked the sixteen most commonly used NSAIDs according to risk for ulcers and bleeding.

- Lowest Risk: nabumetone (Relafen), etodolac (Lodine), salsalate, and sulindac (Clinoril).
- Medium risk: diclofenac (Voltaren), ibuprofen (Motrin, Advil, Nuprin, Rufen), aspirin, naproxen (Aleve, Naprosyn, Naprelan, Anaprox), and tolmetin (Tolectin). (Drugs within this group vary in risk. Studies show, for example, that short-term use of naproxen is twice as likely as ibuprofen to be associated with hospitalization from GI bleeding. Although ketoprofen (Actron, Orudis KT) was considered a medium-risk drug, another study reported that even one week of taking the drug at low doses causes significant GI injury.
- Highest risk: flurbiprofen (Ansaid), piroxicam (Feldene), fenoprofen, indomethacin (Indocin), meclofenamate (Meclomen), and oxaprozin

Drugs Used to Protect Against NSAID-Induced Ulcers. Some agents available to protect against NSAID-induced ulcers include the following:

- Proton-pump inhibitors are the first choice for preventing ulcers in high-risk individuals. They are well tolerated and may even heal existing ulcers. Such drugs include omeprazole (Prilosec), lansoprazole (Prevacid), rabeprazole (Aciphex), and pantoprozole. They may reduce NSAID-ulcer rates by as much as 80% compared with no treatment.

- Misoprostol is a prostaglandin, the protective substance blocked by NSAID use. It is used to prevent NSAID-induced ulcers, both duodenal and gastric, but is not useful in healing existing ulcers. (Arthrotec is a combination of misoprostol and the NSAID diclofenac. One study found that patients taking Arthrotec had 65% to 80% fewer ulcers than those who took NSAIDs alone.)

Muscle Relaxants

A combination of NSAIDs and muscle relaxants such as cyclobenzaprine (Flexeril), diazepam (Valium), carisoprodol (Soma), or methocarbamol (Robaxin) is an effective treatment for acute low back pain. One 1998 study found that patients who took a combination of NSAIDs and muscle relaxants had a better outcome than those taking narcotics, muscle relaxants alone, or no medication. Some experts argue that relaxing muscle spasm may sometimes be harmful, because the tensed back muscles may be serving a purpose by protecting the damaged disc or vertebrae.

Antidepressants

Some experts suggest that treating people with low back pain and depression for the psychological condition may be more beneficial and cost-effective than back treatments. Certain antidepressants, called tricyclics, can even be effective pain killers in *non-depressed* people with chronic back pain. They include amitriptyline (Elavil, Endep), desipramine (Norpramin), doxepin (Sinequan), imipramine (Tofranil), amoxapine (Asendin), nortriptyline (Pamelor, Aventyl), and maprotiline (Ludiomill). It should be noted that tricyclics can have severe side effects. Nonetheless, experts believe there is a useful role for these drugs that warrants further investigation.

Potent Pain Relievers

Opioids. Unless the pain is very severe, experts advise against routinely prescribing pain killers containing opioids (eg, morphine, codeine, meperidine [Demerol], oxycodone [Oxycontin]), or tramadol. A skin patch containing an opioid called transdermal tentanyl (Duragesic) may relieve chronic back pain more effectively than oral opioids. Side effects for all opioids include drowsiness, impaired judgment, nausea, and constipation. Addiction is a risk, although less than is commonly believed when these medications are used for pain relief.

Injections

Injections of different substances are sometimes used to treat low back pain caused by nerve impingement:

- A one-time injection of a corticosteroid (commonly called a steroid) into the area around the spinal column may short-cut sciatic pain until the body heals itself. Corticosteroids reduce inflammation and are a temporary, not permanent, solution. Studies that measure the benefits of steroids on sciatica or low back pain, however, are conflicting.
- Local anesthetics.
- Hypertonic saline (salt water solution).
- Hyaluronidase (an enzyme from mammalian testes that has been used for arthritis). In one study, about a quarter of patients receiving either hypertonic saline or hyaluronidase experienced significant relief right after the treatment and fewer required additional treatments than patients not receiving this therapy.
- Botulinum. Injections of botulinum toxin (Botox) in the lower back. Very small amounts of the bacterial toxin temporarily paralyze muscle tissue. In one 2000 study, Botox relieved pain up to four months. In this study 78% of patients reported their pain was cut at least

in half, compared to 28% who reported the same benefit from saline (salt water) injections. The participants experienced no adverse effects.

None of these substances cure the problem.

Stress Reduction and Behavioral Techniques

Stress Reduction. Stress reducing techniques, including relaxation methods and meditation, may be helpful. One study, for example, reported that meditation was beneficial in reducing pain and improving mood among chronic pain sufferers who had not responded to traditional care.

Cognitive-Behavioral Therapy. Studies report that a course of cognitive-behavioral therapy helps reduce chronic back pain and enhances the patient's ability to deal with it. The primary goal of cognitive therapy in such cases is to change the distorted perceptions that patients have of themselves and their approach to pain. Using specific tasks and self-observation, patients gradually shift their fixed ideas that they are helpless against the pain that dominates their lives to the perception that pain is only one negative and, to a degree, a manageable experience among many positive ones. In the study, therapists also taught relaxation techniques and methods to improve posture. The sessions were two and a half hours each week for 12 weeks. More research is needed.

Alternative Treatments

Transcutaneous Electric Nerve Stimulation. Transcutaneous electric nerve stimulation (TENS) uses low-level electrical pulses to suppress back pain. The standard approach is to give 80 to 100 pulses per second for 45 minutes three times a day. The patients are barely aware of the sensation. A variant (sometimes called percutaneous electrical nerve stimulation or PENS) applies these pulses through a small needle to acupuncture points. A 2000 analysis of studies report that either TENS or PENS appears to offer some relief for chronic low back pain, at least temporarily. PENS may be more effective. In any case, this approach does not appear to be helpful for relief of sciatica in most patients. It may be more beneficial for men than women.

Acupuncture. Acupuncture involves inserting small pins or exerting pressure on certain "energy" points in the body. When the needles have been placed successfully, the patient is supposed to experience a sensation known as Teh Chi, which brings a feeling of fullness, numbness, tingling, and warmth with some soreness around the acupuncture point. Some data suggests that acupuncture may be helpful for chronic low back pain, and one 2000 study comparing it with physiotherapy for back pain among pregnant women found that acupuncture was far more effective. Nevertheless, the strongest evidence to date suggests that, in general, acupuncture does not have a major effect on low back pain. Serious adverse events have been associated with acupuncture, such as infections (HIV, hepatitis, subacute bacterial endocarditis) caused by non-sterile needles or other complications (pneumothorax, cardiac tamponade) caused by tissue trauma. These complications are rarely reported, but there are no studies to determine how common they are.

Herbal Remedies. There have been claims for a number of herbal and so-called natural remedies for relief of back pain. One study of extracts of harpagophytum (a South African herb commonly called Devil's Claw or Grapple Plant) showed some promise. Herbal remedies for back pain may include relaxants such as black haw (viburnum prunifolium) or valerian (valeriana officinalis), anti-inflammatories such as turmeric (curcuma longa) or arnica montana (for external use only), circulatory stimulants such as gingko biloba or rosemary, and pain relievers such as white willow bark (salix alba). It should be strongly noted that if any substance has beneficial effects against serious illness it also, like any drug, most likely has side effects and may even be harmful for some people. In addition, herbal and so-called natural remedies are not regulated, few studies have been conducted on any of these products, and the quality or safety cannot be guaranteed.

Magnet Therapy. Permanent bipolar magnets have gained some popularity as a non-invasive method of relieving pain. To date no studies support such claims and one 2000 study reported no effect in alleviating chronic low back pain. It should be noted that magnets can deactivate heart devices and must be kept at least six inches away from pacemakers or implantable cardioverter defibrillators.

What Are Surgical Procedures For Low Back Pain Or Sciatica?

The rate of all types of back surgery is more than 40% higher in the US than in any other country. Surgical treatments for low back pain rose from 190,000 in 1983 to 335,000 in 1994, although some experts believe that less than 1% of back pain patients need aggressive medical or surgical treatments. The most common reasons for surgery for low back pain are sciatica and spinal stenosis. Limited research indicates that surgery may have better short-term effects than medical treatment (in terms of immediate employability and functioning), but that in the long-term they are about equal. It should be noted that surgery does not always improve outcome and in some cases can even make it worse. Surgery can be an extremely effective approach, however, for certain patients with severe back pain that does not respond to conservative measures.

Indications for Surgery

Evidence of a herniated disc and nerve compression is not an automatic indication for surgery. It is advised only for selected patients with sciatica and spinal stenosis. (The best spinal stenosis candidates are those with a condition known as block spinal stenosis.) Pain should be present for at least four weeks and be so debilitating that it interferes with normal functioning. Other indications for surgery include:

- Progressive weakening in the legs.
- Evidence of some physical abnormality of the spine, such as a bone spur.
- In cases of cauda equina syndrome, an emergency operation may need to be performed to avoid permanent damage.

A patient should be sure that the surgeon has had significant experience with any procedure to be performed.

Discectomy

Standard Surgery. Discectomy is the surgical removal of the diseased disc, thereby relieving pressure on the disc. In spite of the fact that discectomy has been performed for 40 years, few studies have been conducted to determine its real effectiveness. A 2000 analysis of previous studies reported that it appeared to offer faster relief than medical treatment, but long term superiority is uncertain. Although less invasive techniques are being developed and described below, at this time they are no more effective than the standard approach.

Endoscopic Discectomy. Less invasive variations of endoscopy are under investigation, but they are no more or even less effective than standard discectomy. In endoscopy, a catheter (a thin tube) that employs tiny cameras and surgical instruments is inserted into small incisions. In the technique called percutaneous discectomy (PAD) the tube has a device at the tip that cuts away some of the nucleus pulposus and a vacuum that then sucks this gelatinous matter out. A variation called percutaneous automated discectomy uses a motorized probe that cuts off bits of disc material, but it does not appear to offer additional benefits. When using endoscopy, surgeons cannot observe the nerve root itself, so they cannot tell if the fragments removed are the source

of the trouble, nor can they locate and remove any matter that has gone beyond the disc and entered the spinal canal. Endoscopy, then, is not usually warranted for herniated discs, a primary cause of sciatica. Some experts argue that these procedures are rarely useful and patients often need repeat operations. Lasers have been investigated for use with discectomy, but results to date are unimpressive.

Complications. Scar tissue is a significant problem, since it can cause persistent low back pain afterward. Anti-scarring agents or certain devices may help reduce surgical scars and thereby postoperative pain.

Laminectomy or Laminotomy

Operations that shave off part of a vertebra (laminotomy) or remove all of it (laminectomy) may be used in certain cases of spinal stenosis or spondylolisthesis to decompress the nerve. It may also be used to remove benign tumors on the spine. Although either procedure often brings immediate relief from pain, a 1999 statistical study suggested that it is inappropriately performed in 60% or more of sciatica cases. There are small risks to the operation and it is not always successful. Some recurrence of back pain and sciatica occurs in half to two-thirds of postoperative patients. One study reported that the operation in children and young adults can increase the risk for spinal deformity.

Spinal Fusion

In cases where abnormal positioning or vertebrae movement puts pressure on the nerves, such as spinal stenosis or spondylolisthesis, surgeons may fuse vertebrae together. (It is not clear, however, whether fusion is any more effective for stenosis or spondylolisthesis than procedures for reducing disc pressure.) Fusion employs a bone graft or some other device to join the vertebrae together. One medical device uses a tiny hollow metal cage, which is implanted into the disc space. Bone is removed from the patient and packed inside the cage; over time the bone grows through the holes and around the device, fusing the vertebrae. In one study, the device was successful in 72% of patients who experienced decreased pain without any loss of muscle strength or function.

Postoperative Period: Complications and Outlook

Many patients still have back pain after discectomy that delays discharge. Narcotics are usually needed; adding an injected NSAID may speed resolution of pain. It should be noted that one study reported that an injected NSAID after fusion procedures may reduce the chances for successful bone healing and union. Other complications of spinal surgery can include nerve and muscle damage, infection, scarring, and the need for reoperation. Patients now often remain in bed only three or four days after disc surgery; studies indicate that such patients have the same or even fewer complications than those who stay in bed for weeks. It may take four to six weeks for full recovery. Gentle exercise may be recommended.

Other Techniques

Electro-Thermal Surgery. A promising procedure known as intradiscal electrothermal treatment (IDET) employs a probe that uses electricity to heat and shrink the injured disc tissue. After healing, the disc is toughened and desensitized, and patients report significant reductions in pain. This procedure requires a substantial post-operative recovery period.

Nerve Blocks. A number of surgical techniques are available for relieving pain by impairing nerves that are causing pain due to impingement. In one 2000 study that used electrical stimulation to block the nerves, 60% of the patients reported at least 90% relief of pain after a year, and 87% reported at least 60% relief.

Chemonucleolysis. Chemonucleolysis (CNL) is not performed much in the US although it is common overseas. It is usually warranted only for sciatica caused by a herniated disc that is not relieved by other standard treatments. One study indicated it might help some patients with sciatica caused by low-grade (but not severe) spondylolisthesis. The physician injects the herniated disc with chymopapain, an enzyme made from papaya. It takes only two to three minutes. Chymopapain, a common ingredient in meat tenderizers, softens the nucleus pulposus (the disc's gelatinous filling), thus reducing the bulge and relieving the pressure on the sciatic nerve.

A 2000 analysis reported that it was more effective than no treatment at all and less invasive (but less effective) than discectomy. Some experts argue that the procedure has little value, but in 17 out of 20 studies, CNL was found ultimately to be as beneficial as laminectomy, although it may take days or even months for complete pain relief. Risks include severe allergic reactions to chymopapain, which occur in less than 1% of people, and nerve damage if the enzyme leaks out of the disc (a chance of about .05%).

Surgery for Piriformis Syndrome. Piriformis syndrome, entrapment of the sciatic nerve deep in the buttock by the piriformis muscle, is a controversial cause of sciatica, and some experts do not believe that it plays any role. In selected cases, however, such as those who develop the condition after an injury, surgery to cut the piriformis muscle and thereby free the sciatic nerve has resulted in significant improvement.

Where Else Can Information About Low Back Pain Be Obtained?

American Physical Therapy Association, 1111 N. Fairfax St., Alexandra, VA 20013-1148. Call (703-684-2782) or on the Internet (http://www.apta.org/)

The American Orthopaedic Association (http://www.aoassn.org/)

American Academy of Orthopaedic Surgeons, 6300 N. River Road, Rosemont, IL 60018-4262. Call (847-823-7186) or (800-346-AAOS) on the Internet (http://www.aaos.org/)

President's Council on Physical Fitness and Sports, HHH Building, Rm. 738H, 200 Independence Ave., S.W., Washington, DC 20. Call (202-690-9000) for general information on exercise and fitness.
The council publishes *Physical Activity and Fitness Research Digest* .

National Arthritis and Musculoskeletal and Skin Diseases, Information Clearinghouse, National Institutes of Health, 1 AMS Circle, Bethesda, Maryland 20892-3675. Call (301-495-4484) or on the Internet (http://www.nih.gov/niams/healthinfo/)

National Institute for Occupational Safety and Health (NIOSH), 4676 Columbia Parkway, Cincinnati OH 45226. Call (800-356-4674) or on the Internet (http://www.cdc.gov/niosh/homepage.html)

American Chronic Pain Association, P.O. Box 850, Rocklin, CA 95677. Call (916) 632-0922 or on the Internet (http://www.theacpa.org/)

National Chronic Pain Outreach Association. Call (540-862-9437)

American Pain Society, 4700 W. Lake Avenue, Glenview, IL 60025. Call (847-375-4715) or on the Internet (http://www.ampainsoc.org/)

International Association for the Study of Pain, 909 NE 43rd St., Suite 306, Seattle, WA 98105-6020. Call (206-547-6409) or on the Internet (http://dasnet02.dokkyomed.ac.jp/IASPM/IASP.html)

The National Association for Chiropractic Medicine, 15427 Baybrook Drive, Houston, TX 77062. Call (281-280-8262) or on the Internet (http://www.chiromed.org/)
This association believes that chiropracty should be limited to treating joint conditions using scientific prinicples. (The other two chiropractice organizations are more controversial and tend toward alternative treatments. American Chiropractors' Association stresses vitamins and natural diets as well as joint conditioning. The International Chiropractors' Association still advocates 19th century principles of relating pinched nerves to overall health.)

BackCycler. Call (800-959-3746)
BackCycler is a device designed by orthopedists at the Spine Institute of New England to alleviate the discomfort of sitting in a car or airplane.

Internet Sites

The International Intradiscal Therapy Society (IITS) http://www.iits.org

International Spinal Injection Society http://www.spinalinjection.com/

This site provides results of independent tests of the quality and potency of herbal and

nutritional products. http://www.consumerlab.com

Illustrations of Back Surgery

Site has good description of back procedures http://www.spine-surgery.com

Another site with good descriptions of back operations http://www.yoursurgery.com

Special Instructions: