CONDITION

Spondylolisthesis

Spondylolisthesis is a condition in which one spinal bone slips forward over the bone below it.

WHAT IT IS
Forward slipping of one spinal bone over another

BODY SYSTEM
Bones, joints, and nerves

MAIN SYMPTOMS
Low back pain, leg pain, numbness, hamstring tightness

WHAT CAUSES IT
Stress fracture, degeneration, birth difference, trauma, or bone damage

HOW IT IS DIAGNOSED
Standing spinal X-rays, sometimes MRI or CT

MAIN TREATMENT
Activity changes, physiotherapy, pain relief, sometimes surgery

CAN IT BE CURED?
Sometimes - surgery can stabilise the affected spinal segment

IS IT AN EMERGENCY?
Sometimes - new bladder, bowel, or saddle sensation changes

LONG-TERM OUTLOOK
Often manageable, though nerve symptoms or slipping may progress

Overview

Spondylolisthesis means that one vertebra, or spinal bone, has slipped forward over the vertebra below it. It most often affects the lower back, called the lumbar spine.

The amount of slipping can be small or more pronounced. Some people have no symptoms and discover it during an X-ray for another reason. Others develop ongoing lower back pain, leg symptoms, or difficulty standing and walking.

Spondylolisthesis is not the same as a slipped disc. A disc is the soft cushion between two vertebrae. In spondylolisthesis, the position of a vertebra has changed.

Doctors often describe the slip using grades. Grade 1 is a small slip, while higher grades mean that the vertebra has moved farther forward. The grade helps describe the X-ray, but it does

not always show how much pain a person will have. A small slip can cause symptoms, while a larger one may cause few problems.

The condition matters because the changed position may narrow the space around nearby nerves. It may also make that part of the spine less stable. Treatment is based on symptoms, nerve function, the type and grade of slip, and whether it is changing over time.

Symptoms

Lower back pain is the most common symptom. It may feel like a dull ache or become worse with standing, walking, lifting, or bending backward. Rest or sitting may ease it.

Other possible symptoms include:

Leg pain can occur when the slip or related changes press on a spinal nerve. Pain that travels from the back into the buttock and leg is sometimes called sciatica.

Degenerative spondylolisthesis may cause spinal stenosis, which means narrowing of the space for the nerves. This often causes leg pain, numbness, or heaviness during walking. Symptoms may improve when sitting or bending forward.

Children and teenagers with spondylolisthesis may have lower back pain, tight hamstrings, or a change in posture or walking pattern. Some have no symptoms.

Symptoms alone cannot confirm spondylolisthesis. Back and leg pain have many possible causes, so an assessment and imaging may be needed.

- Pain in the buttocks or legs
- Tingling, numbness, or weakness in one or both legs
- Tight hamstring muscles at the back of the thighs
- Leg heaviness or cramping during standing or walking
- Difficulty standing upright or walking normally
- Pain that improves when leaning forward or sitting

Causes and risk factors

There are several types of spondylolisthesis, with different causes.

Isthmic spondylolisthesis develops when there is a defect or stress fracture in a small bridge of bone at the back of a vertebra. This area is called the pars interarticularis. The defect itself is known as spondylolysis. Repeated backward bending and twisting can contribute, particularly

during growth.

Sports such as gymnastics, football, weightlifting, and diving may place repeated stress on this area. Most people who take part in these activities do not develop spondylolisthesis.

Degenerative spondylolisthesis occurs when age-related changes affect the discs and small joints that support the spine. These structures may become less able to keep a vertebra in position. This type is more common in later adulthood and usually affects the lower lumbar spine.

Dysplastic spondylolisthesis is linked to differences in how part of the spine formed before birth. These differences may make slipping more likely as a child grows.

Less common causes include a major spinal injury, damage from a bone condition or tumour, and changes following spinal surgery.

Risk can also be influenced by family traits, spinal shape, repeated loading of the lower back, and existing wear in the spinal joints. Having a risk factor does not mean that a slip will occur.

Diagnosis

Assessment usually begins with a discussion of your symptoms, activities, previous injuries, and how pain affects walking or daily tasks. A physical examination may check posture, spinal movement, hamstring tightness, leg strength, sensation, and reflexes.

Standing X-rays are the main test used to confirm that a vertebra has slipped. Standing images show how the spine carries weight. Bending X-rays may sometimes be used to look for excess movement between vertebrae.

An MRI scan gives more detail about discs, nerves, and the spinal canal. It may be used when there is leg pain, numbness, weakness, or concern about nerve compression.

A CT scan shows bone in greater detail. It can help identify a pars stress fracture or clarify spinal anatomy when needed.

Imaging findings are considered alongside your symptoms and examination. The amount of slipping on an X-ray does not, by itself, determine whether treatment or surgery is needed.

Treatment and management

Treatment aims to reduce pain, maintain movement, protect nerve function, and help you continue daily activities. Many people, particularly those with a low-grade slip and no worsening nerve problems, are treated without surgery.

Activity changes may help settle symptoms. This can mean temporarily reducing movements that repeatedly trigger pain, especially heavy loading or forceful backward bending. Prolonged bed rest is generally avoided because it can reduce strength and mobility.

Physiotherapy may focus on controlled movement, trunk and hip strength, flexibility, posture, and a gradual return to activity. For athletes, rehabilitation may also address technique and safe progression back to sport.

Pain-relieving medicines may be considered. The suitable option depends on other health conditions, current medicines, and the risk of side effects. A pharmacist or prescriber can help with safe choices.

A brace is sometimes used for a limited period, particularly in a younger person with a painful pars stress injury. It is not routinely needed for everyone.

A spinal injection may provide temporary relief when an irritated nerve is causing leg pain. It does not repair the slip, and the benefit is not the same for every person.

Surgery may be considered when:

Surgery often involves spinal fusion, which joins affected vertebrae so they no longer move against each other. Decompression may also be performed to create more room for compressed nerves. In selected cases, the surgeon may partly realign the vertebra.

Surgery has risks and requires recovery and rehabilitation. The choice depends on the type of spondylolisthesis, symptoms, imaging, general health, and treatment goals.

- Pain remains disabling despite an appropriate period of non-surgical care
- Nerve pain, numbness, or weakness is persistent or worsening
- Walking is severely limited by nerve compression
- The slip is high-grade, unstable, or progressing
- Bladder, bowel, or other serious nerve problems develop

Complications

Spondylolisthesis may remain stable, but possible complications include long-term back pain, reduced activity, and recurrent flare-ups.

Nerve compression can lead to persistent leg pain, numbness, or weakness. Severe narrowing may limit how far a person can stand or walk comfortably. Long-lasting nerve compression can sometimes leave ongoing symptoms even after treatment.

A slip may progress, especially during growth or when it is already high-grade. Progression is

not inevitable, and follow-up imaging is not required for every stable adult case.

Rarely, severe compression of the nerves at the bottom of the spinal canal causes cauda equina syndrome. This can affect bladder or bowel control and sensation around the genitals, buttocks, or inner thighs. It requires emergency assessment.

Possible complications of surgery include infection, bleeding, blood clots, nerve injury, failure of the bones to fuse fully, or continued pain. A surgical team should explain the expected benefits and risks for the proposed procedure.

Prevention

Not every case can be prevented. Spondylolisthesis related to spinal development, inherited traits, or age-related degeneration may occur despite healthy habits.

Stress injuries may be less likely when training increases gradually, technique is appropriate, and back pain is not repeatedly trained through. Rest and assessment are important when a young athlete develops ongoing pain during activities involving repeated back extension.

Regular physical activity can support muscle strength, balance, and bone health. Safe lifting methods and avoiding smoking may also support spinal health, but they cannot guarantee that spondylolisthesis will not develop.

Living with it and what to expect

The course differs between people. Many low-grade slips remain stable for years. Symptoms may come and go, often changing with activity, fitness, sleep, and other sources of back strain.

A long-term management plan may include regular exercise, pacing demanding activities, and using physiotherapy strategies during flare-ups. Complete avoidance of movement is usually unnecessary unless a healthcare professional has identified a specific risk.

Some people need routine follow-up to check symptoms, strength, walking ability, or changes on imaging. Follow-up may be particularly important during growth, with a high-grade slip, or when symptoms are changing. Stable findings without nerve symptoms may need less monitoring.

Degenerative changes do not usually reverse, but pain and function can improve. A visible slip may remain on imaging even when symptoms are well controlled.

After successful treatment, many people continue work, exercise, and ordinary family activities. Some need to adjust sports, lifting, or tasks that repeatedly worsen symptoms.

Recovery after spinal fusion takes time, and improvement may continue over several months. Surgery does not guarantee complete freedom from pain.

When to get medical help

Arrange a routine appointment if back pain lasts for several weeks, keeps returning, interferes with sleep or daily activities, or is accompanied by leg pain, tingling, or numbness. A child or teenager with persistent activity-related back pain should also be assessed.

Seek prompt medical advice if you develop new or increasing leg weakness, worsening numbness, repeated falls, or a clear reduction in how far you can walk.

Get emergency medical help for:

These symptoms can indicate serious nerve compression or spinal injury. They need urgent assessment even if spondylolisthesis has not been diagnosed.

- New difficulty starting or controlling urination
- Loss of bladder or bowel control
- Numbness around the genitals, anus, buttocks, or inner thighs
- Rapidly worsening weakness in both legs
- Severe back pain after major trauma, especially with weakness or numbness

Common questions

Is spondylolisthesis the same as a slipped disc?

No. Spondylolisthesis is a slipped vertebra. A slipped or herniated disc happens when part of a spinal disc pushes outward. Both conditions can irritate nerves and cause similar leg symptoms.

Can spondylolisthesis heal on its own?

The vertebra does not usually move fully back into place on its own. A recent pars stress injury may heal in some younger people, but an established slip often remains visible on imaging. Symptoms can still improve without surgery.

Can I exercise with spondylolisthesis?

Many people can remain active. The right activities depend on symptoms, nerve function, and the type of slip. Walking, controlled strengthening, and low-impact exercise are often used, while painful repeated back extension or heavy loading may need temporary modification.

Does spondylolisthesis always get worse with age?

No. Many slips remain stable. Degenerative changes can progress, but changes on an X-ray do not always mean worsening pain. New weakness, numbness, or reduced walking ability deserves reassessment.

Will I need surgery?

Not necessarily. Many people improve with activity changes, physiotherapy, and symptom relief. Surgery is mainly considered for disabling symptoms that continue despite non-surgical care, serious nerve compression, instability, or progression.

Can spondylolisthesis cause paralysis?

Paralysis is not a usual outcome. Severe nerve compression can rarely cause major weakness or cauda equina syndrome. New bladder or bowel problems, saddle-area numbness, or rapidly worsening leg weakness require emergency care.

Sources

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- American College of Radiology: Appropriateness Criteria-Low Back Pain