CONDITION

Spinal injury

A spinal injury is damage to the spine that may also affect the spinal cord or nearby nerves.

WHAT IT IS
Damage to spinal bones, tissues, cord, or nerves

BODY SYSTEM
Bones, joints, and nervous system

MAIN SYMPTOMS
Back or neck pain, weakness, numbness, bladder changes

WHAT CAUSES IT
Falls, crashes, sports injuries, or violence

HOW IT IS DIAGNOSED
Neurological examination with CT and sometimes MRI

MAIN TREATMENT
Spinal stabilization, surgery when needed, and rehabilitation

CAN IT BE CURED?
Sometimes - bones may heal; cord damage may persist

IS IT AN EMERGENCY?
Yes - suspected new injury needs urgent assessment

LONG-TERM OUTLOOK
Recovery ranges from full healing to lifelong disability

Overview

A spinal injury is damage to one or more parts of the spine. This may involve the vertebrae, which are the bones of the spine, or the discs and ligaments that hold them together. A more serious injury can damage the spinal cord or the nerves leaving it.

The spinal cord carries messages between your brain and most of your body. Damage can affect movement, sensation, breathing, blood pressure, and bladder or bowel control. The effects depend on where the injury is and how much nerve tissue has been harmed.

A broken vertebra does not always damage the spinal cord. Some fractures are stable, meaning the spine still supports and protects the cord. Other injuries make the spine unstable or press on the cord and require urgent treatment.

A spinal injury can affect the neck, upper or lower back, or the group of nerves at the bottom of

the spine called the cauda equina. Prompt assessment helps prevent avoidable movement and identifies injuries that may need surgery.

Symptoms

Symptoms can begin immediately after an accident. They may also appear or worsen as swelling or bleeding develops around the spinal cord.

Possible symptoms include:

Symptoms below the injury may occur on one side or both sides of the body. An injury in the neck can affect the arms, trunk, and legs. An injury lower in the back may mainly affect the legs and pelvic organs.

Not every spinal fracture causes obvious symptoms. This is more likely in older adults or people with osteoporosis, a condition that weakens bones.

- severe or increasing neck or back pain
- tenderness, swelling, bruising, or an unusual spinal shape
- weakness, heaviness, or paralysis in an arm or leg
- numbness, tingling, burning, or reduced awareness of touch
- difficulty walking or keeping your balance
- loss of bladder or bowel control
- difficulty breathing or coughing effectively
- unusual sexual or genital sensation

Causes and risk factors

Spinal injuries most often result from a sudden force that bends, twists, compresses, or penetrates the spine. Common causes include road crashes, falls, sports injuries, diving accidents, workplace incidents, and physical violence.

Falls from standing height can cause serious injury when bones are weakened by osteoporosis. A spine already affected by arthritis or a condition such as ankylosing spondylitis may also be more vulnerable.

Factors that can increase the chance of an injury include:

Cancer, infection, bleeding, and inflammatory conditions can also damage or compress the

spinal cord without an accident. These are not usually described as traumatic spinal injuries, but they can cause similar symptoms and may also be emergencies.

- taking part in contact, high-speed, or high-impact activities
- working at height or around heavy machinery
- not using seat belts or suitable protective equipment
- alcohol or drug use that affects coordination or judgment
- older age, poor balance, or reduced muscle strength
- weak bones caused by osteoporosis or another medical condition

Diagnosis

Emergency assessment begins with breathing, circulation, and other life-threatening injuries. Until the spine has been assessed, the healthcare team may limit movement and support the head, neck, or body.

A neurological examination checks muscle strength, reflexes, sensation, and bladder or bowel symptoms. It helps show which parts of the spinal cord or nerves may be affected. The examination may be repeated because findings can change during the first hours or days.

A CT scan uses X-rays and a computer to create detailed images. It is commonly used to find spinal fractures and assess the position of the bones.

An MRI scan gives more detail about the spinal cord, discs, ligaments, nerves, bleeding, and swelling. It may be needed when there are neurological symptoms, suspected ligament damage, or findings that CT cannot explain.

Doctors may describe a spinal cord injury as complete or incomplete. A complete injury means that no movement or sensation is found in the lowest spinal segments during a standardized examination. An incomplete injury means that some function remains. These terms help classify the injury, but they do not predict an individual outcome with certainty.

Treatment and management

Immediate care focuses on protecting the spine while supporting breathing and blood pressure. If you may have a spinal injury, avoid unnecessary movement and wait for trained emergency help unless staying in place creates an immediate danger.

Some stable fractures can be managed with pain relief, activity guidance, monitoring, and

sometimes a brace. Follow-up imaging may be used to check healing and spinal alignment.

Surgery may be needed to:

Surgery cannot always reverse spinal cord damage. Its goals may include preventing further injury, restoring stability, and making rehabilitation safer.

Rehabilitation often begins during the hospital stay. Its content depends on the level of injury and the abilities that remain. It may include physiotherapy, occupational therapy, respiratory care, mobility training, and support with everyday activities.

People with spinal cord damage may also need help managing:

Treatment plans are reviewed as swelling settles, fractures heal, and abilities change. Equipment and home adaptations may also need adjustment over time.

- remove pressure from the spinal cord or nerves
- realign and stabilize damaged vertebrae
- repair an unstable injury
- remove bone, disc material, or other tissue causing compression
- bladder and bowel function
- nerve pain or muscle spasms
- skin protection and pressure relief
- wheelchairs, braces, or walking equipment
- sexual health and fertility
- mood, sleep, relationships, work, or education

Complications

Possible early complications include breathing problems, blood clots, bleeding, infection, and further nerve damage from an unstable spine. Reduced movement can increase the risk of clots in the legs and lungs.

Longer-term complications of spinal cord injury can include pressure injuries, repeated urinary infections, constipation, muscle stiffness, nerve pain, weak bones, and reduced joint movement. Regular skin checks and planned bladder, bowel, and mobility care help reduce some of these problems.

Autonomic dysreflexia is a potentially dangerous rise in blood pressure that can occur in some people with injuries at or above the middle of the chest. It may cause a sudden pounding

headache, sweating, flushing, blurred vision, or anxiety. It requires immediate action according to the person's emergency plan and urgent medical help.

Emotional effects are also common. Changes in independence, work, relationships, or body function can contribute to anxiety, low mood, or post-traumatic stress. These concerns are part of spinal injury care and deserve specific support.

Prevention

Not every spinal injury can be prevented. Accidents can happen even when reasonable precautions are taken.

Practical ways to reduce risk include wearing a seat belt, using the correct child restraint, wearing suitable protective sports equipment, and following workplace safety procedures. Check water depth before diving and never dive into unknown or shallow water.

Reducing falls is particularly important if you are older or have weak bones. This may involve improving lighting, removing trip hazards, reviewing vision and balance, and treating osteoporosis when appropriate.

Sports coaching should include safe techniques and rules intended to prevent dangerous impacts. Protective equipment lowers risk but cannot make a high-impact activity completely safe.

Living with it and what to expect

The course of a spinal injury depends mainly on its location, stability, and whether the spinal cord was damaged. Many stable bone injuries heal over several months. Pain and stiffness may improve gradually, although some people have lasting discomfort.

After a spinal cord injury, the greatest neurological changes often occur early in recovery, but improvement can continue later. It may involve strength, sensation, coordination, or control of bladder and bowel function. It is not possible to promise how much function will return.

Rehabilitation focuses on both recovery and independence. If an ability does not return, new techniques, equipment, or home changes can make daily activities safer and easier. Some people walk independently or with support. Others use a wheelchair for some or all mobility.

Routine follow-up may monitor spinal stability, pain, skin health, breathing, bone strength, bladder and bowel care, and equipment needs. New health problems should not automatically be assumed to come from the spinal injury.

Many people return to education, employment, relationships, parenting, travel, and recreation after spinal injury. The time, support, and adaptations needed are different for each person. Peer support and specialist rehabilitation services can help with practical and emotional adjustment.

When to get medical help

Call emergency services after a significant fall, crash, sports impact, or other trauma if a spinal injury is possible. Do not twist, sit up, or move the injured person unless there is an immediate danger, such as fire.

Emergency symptoms include:

If you already have a spinal injury, seek urgent assessment for sudden neurological changes, chest pain, severe breathlessness, or a hot and swollen leg. Fever with worsening breathing, urinary symptoms, or a deep skin wound also needs prompt medical advice.

Routine follow-up is appropriate for gradually increasing pain, recurring muscle spasms, constipation, equipment problems, minor skin redness that quickly resolves after pressure is removed, or changes in mood or sleep. Arrange earlier review if these issues are worsening or affecting daily life.

- new weakness, paralysis, numbness, or loss of coordination
- severe neck or back pain after an injury
- loss of bladder or bowel control
- numbness around the genitals, buttocks, or inner thighs
- difficulty breathing after neck or back trauma
- loss of consciousness or confusion with a possible spinal injury
- a sudden pounding headache, sweating, or flushing in someone at risk of autonomic dysreflexia

Common questions

Can you walk after a spinal injury?

Some people can walk after a spinal injury, while others cannot. Walking depends on the level and completeness of any spinal cord damage, as well as strength, balance, pain, and general health. Braces, walking aids, therapy, or a wheelchair may be used at different stages.

Can a spinal cord injury heal?

Damaged spinal cord nerve cells do not reliably regrow. Some function may return as swelling settles and surviving nerve pathways recover. Rehabilitation can also help you use remaining function more effectively, but it cannot guarantee nerve recovery.

Is a broken back the same as a spinal cord injury?

No. A broken back means that one or more vertebrae are fractured. The spinal cord may be unharmed, bruised, compressed, or severely damaged. Imaging and a neurological examination are needed to tell the difference.

How long does spinal injury recovery take?

Bone healing and early rehabilitation usually take months rather than days. Recovery after spinal cord damage can continue for longer, with the fastest changes often occurring earlier. The timetable is influenced by the type of injury, complications, surgery, and rehabilitation needs.

Can I have sex or children after a spinal cord injury?

Often, yes. Sensation, erections, ejaculation, vaginal lubrication, fertility, and pregnancy may be affected in different ways. Sexual health and fertility specialists can offer practical treatment and counselling based on your goals.

Should I move someone who may have injured their spine?

Usually not. Keep them still, call emergency services, and follow the call handler's instructions. Move them only when remaining in place poses an immediate danger or when movement is necessary to provide lifesaving care.

Sources

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