

Peripheral nerve disorders



It can be easy to take your nerves for granted – until pain, weakness or other symptoms bring them to your attention. If you or a loved one is living with a peripheral nerve disorder, expert help is available. Our neurologists and neurosurgeons use state-of-the-art technologies and procedures to diagnose and manage peripheral nerve conditions.

What is a peripheral nerve disorder?

The peripheral nervous system connects your brain and spinal cord (the central nervous system) to your body. It includes all the nerves that go into your legs, arms, trunk and face. Electrical signals travel along these nerve pathways to and from the central nervous system.

Peripheral nerves carry information about things like temperature, pressure and pain from your body to your brain. And they send signals from your brain to your muscles and organs to control things like your movement, digestion, breathing, and heartbeat.

Peripheral nerve disorders lead to problems with carrying these signals.

Types of peripheral nerve disorder

Over 100 types of peripheral nerve disorder have been recognised. Some common ones include:

- diabetic neuropathy – which is a complication of diabetes
- carpal tunnel syndrome – which results from pressure on the median nerve as it runs through a tunnel in the wrist
- cubital tunnel syndrome – which involves compression of the ulnar nerve at the elbow
- radial tunnel syndrome – which results from compression of the radial nerve as it travels through a tunnel in the forearm
- meralgia paraesthetica – this syndrome involves compression of a nerve as it passes through the groin
- tarsal tunnel syndrome – this involves pressure on the

tibial nerve as it passes through a tunnel in the ankle

- piriformis syndrome – which involves irritation of the sciatic nerve in the buttock area
- Guillain-Barré syndrome – an autoimmune disorder in which the body's immune system attacks the nerves
- complex regional pain syndrome – a type of nerve problem that leads to prolonged and severe pain in an arm or leg.

Symptoms of a peripheral nerve disorder

Peripheral nerve disorder symptoms vary widely depending on the type and location of the affected nerves, and the cause and severity of nerve damage.

They can be grouped according to the type of nerves affected.

Motor symptoms

Motor nerves control your muscles, so symptoms will involve movement control. They include difficulties with:

- standing, walking or using your arms and hands
- balance and coordination
- speaking and swallowing
- pain, muscle cramps or twitching
- weakness and muscle wasting.

Sensory symptoms

The sensory nerves carry information about sensations (such as heat, cold, and touch) from your body to your brain. Sensory symptoms include:

- numbness, tingling, or pain (often in the feet and hands)
- inability to feel cold, heat, or pain (such as a burn or cut)
- altered sensation, such as pain from light touch.

Autonomic symptoms

The autonomic nerves send signals to your organs to control automatic functions like digestion, breathing and heart rate. Autonomic symptoms include:

- digestive problems such as vomiting, diarrhoea and constipation
- fast or slow heartbeat
- changes to how much you sweat
- difficulties with urinary or sexual function.

Peripheral nerve disorder symptoms can range from mild to severe. While a peripheral nerve condition is rarely life-threatening, it can have a significant impact on your function and quality of life. That's why it's vital to see a specialist who can assess you and create a personalised management plan.

What causes peripheral nerve disorders?

Many diseases and injuries can damage the peripheral nerves. Causes of peripheral nerve disorders include:

- conditions that affect hormone function, including diabetes and hypothyroidism
- infections that affect the peripheral nervous system, such as HIV, shingles, cytomegalovirus, and Epstein-Barr virus
- autoimmune disorders, including rheumatoid arthritis and lupus
- conditions that cause pressure on nerves, such as carpal tunnel syndrome
- kidney, liver and blood vessel problems
- some types of cancer and cancer treatment
- smoking and heavy alcohol use
- exposure to toxins including some medicines, lead, mercury, and arsenic
- physical injury from trauma, repeated stress, or damage that occurs during surgery
- nutritional problems, especially vitamin B12 deficiency
- genetic or inherited conditions.

In some people, the cause of peripheral nerve disorder cannot be identified. Regardless of the cause, expert help is available.

Referral for peripheral nerve disorder management

If you have peripheral nerve disorder symptoms, your GP might refer you to a neurologist or neurosurgeon for further assessment and treatment.

To start your treatment with us, ask your GP for a referral to one of our experienced neurological specialists.

Your doctor can address the referral to a specific specialist, or simply to 'Dear Doctor'.

Peripheral nerve disorder prevention

While it's not possible to prevent all peripheral nerve conditions, you may be able to lower your risk by:

- getting help to manage health conditions that can damage nerves, especially diabetes
- getting support to quit smoking or reduce your alcohol use
- doing what you can to avoid an injury
- avoiding toxic substances like lead or arsenic
- eating a healthy diet
- avoiding movements or positions that put strain on your nerves.

How are peripheral nerve problems diagnosed?

If your doctor thinks you could have a peripheral nerve condition, they will do a thorough assessment. The choice of investigations will depend on your symptoms and the suspected cause. You might need several investigations to get an accurate diagnosis. Your healthcare team will talk to you about which of the following tests are suitable.

Physical examination

Your doctor will conduct physical tests to see how your nervous system is working. For example, they might look at your muscle strength, walking, co-ordination, balance, vision, sensation, and reflexes.

Blood tests

Blood tests can detect underlying factors such as diabetes, vitamin deficiencies, liver or kidney problems, infections, toxic substances and abnormal immune system function.

Genetic tests

Genetic testing might be recommended for some inherited neuropathies.

Nerve conduction studies

These tests show how well peripheral nerves are functioning. They involve placing small electrodes at different points along the nerve pathway to measure the speed and strength of electrical signals.

Electromyography (EMG)

This test involves placing fine needles into muscles to measure their electrical activity.

Nerve biopsy

This procedure involves collecting a sample of nerve tissue for examination.

Nerve block

In this test, doctors inject local anaesthetic near the site of suspected nerve compression. If you get temporary relief afterwards, this helps confirm that nerve is responsible for your symptoms.

Neurodiagnostic skin biopsy

This procedure involves collecting a very small skin sample under local anaesthetic and examining the nerve endings within it under a microscope.

Autonomic testing

Specialists use various tests to check autonomic nervous system function. These include:

- breathing and Valsalva manoeuvre tests – which look at your blood pressure and heart rate while you do specific types of breathing.
- tilt table test – which involves measuring your blood pressure and heart rate while your body is moved safely into different positions on a motorised tilting table.
- quantitative sudomotor axon reflex test (QSART) – which measures function in the nerves that control sweating on your arm or leg.
- thermoregulatory sweat test (TST) – this test measures your ability to sweat in a heated environment.
- bladder ultrasound – to check whether you have any urine left in your bladder after you urinate.

X-ray

X-rays can detect bone or joint abnormalities that could lead to nerve compression.

CT (computerised tomography) scan

This test uses x-rays to take multiple images of your spine, which a computer puts together to provide detailed pictures. A CT scan can reveal things that may be affecting nerve function, such as bulging discs, narrowing of the spinal canal, tumours, or bone conditions.

MRI (magnetic resonance imaging)

In an MRI scan, the machine uses a powerful magnet, radio waves and a computer to generate detailed, cross-sectional images of the tissues. MRI scans can be helpful for finding nerve compression, structural issues, and ruling out other conditions. An MRI of the spine or affected area can help doctors make an accurate diagnosis and plan your treatment.

Ultrasound

These tests use sound waves to create a detailed image of the tissues. An ultrasound of the nerves or muscles may pick up abnormalities associated with a peripheral nerve condition.

How are peripheral nerve disorders treated?

Treatment for a peripheral nerve disorder will depend on various things, including the cause, severity, and location of the problem. Your age and general health will also be considered. Your specialist will talk to you about the options and help you decide on the best treatment approach.

Non-surgical treatment for peripheral nerve disorders

Most peripheral nerve conditions can be managed conservatively. Some can even be cured. Non-surgical management options for peripheral nerve disorders include:

Treating any underlying causes

Some peripheral nerve problems are caused by health conditions or lifestyle factors. Managing or modifying these may help to ease symptoms, or even resolve them as nerves recover from damage. Correction of underlying causes might include:

- managing health conditions such as diabetes, thyroid problems or vitamin deficiencies
- getting support to quit smoking or reach a healthy weight
- avoiding or reducing exposure to toxins.

Medications

Many types of medications are used to treat peripheral nerve conditions, including:

- pain relievers – you might be prescribed medicines to ease pain coming directly from nerves (neuropathic pain) or to reduce pain signalling in the brain.
- topical medicines – some medicines (such as local anaesthetics) can be used on the skin to help ease symptoms.
- immune suppressing medications – these may be prescribed if your nerves are affected by an autoimmune condition.
- blood pressure medications – which can be helpful for some people with autonomic symptoms.
- immunoglobulin injections – which can help to regulate immune system activity.

Symptom management

Various strategies can help to relieve the symptoms of a peripheral nerve disorder, or help you live with it better. These include:

- walking aids (such as a walking stick or frame) can help you get around more easily
- braces or splints to support or relieve pressure on the affected body part
- orthopaedic shoes or orthotics to support your feet and improve your walking
- therapies to ease pain, such as massage, acupuncture or electrical stimulation
- exercises to improve or maintain your muscle strength and function
- psychological therapies to help you cope with your condition.

Surgical treatment for peripheral nerve disorders

In some cases, surgery might be recommended to treat or manage a peripheral nerve problem. This may be performed by a neurosurgeon, or by an orthopaedic surgeon with expertise in managing conditions of the affected body part (such as the spine or wrist).

Surgeries used to manage peripheral nerve disorders include:

Decompression

Decompression procedures aim to relieve symptoms by reducing pressure on nerves. Your surgeon may trim away bony spurs, tumour tissue, bulging disc material or soft tissues to allow nerves more freedom to move.

Disc replacement

If a damaged or degenerated disc in the spine is pressing on a nerve, it can sometimes be removed and replaced with an artificial one.

Tendon transfer

This procedure involves moving a tendon to help hold a limb in a better position and improve function.

Fusion

This procedure aims to ease symptoms or improve function by preventing movement of a specific joint.

Recovery from a peripheral nerve disorder

Your recovery time will depend on your condition and which type of treatment you have, along with factors like your age, health, and lifestyle. If you have surgery for a peripheral nerve condition, here's a guideline about what to expect afterwards.

Immediate postoperative recovery

After a surgical procedure, it's normal to have some swelling, discomfort, and limited mobility in the affected area. You will probably be prescribed pain medications and given instructions for looking after the wound.

Protection of healing tissues

You might need to protect the area to prevent undue strain on healing tissues by wearing a splint, brace, sling, or dressings. You might also need to avoid or modify some activities during the recovery period. As healing progresses, you can expect to gradually get back to your usual activities.

Rehabilitation and physiotherapy

Regaining physical function is an important part of recovery after peripheral nerve surgery. Physiotherapy can help restore muscle strength, improve your movement, and optimise your functional capacity. Physiotherapy techniques include exercises, stretching, manual therapy, and modalities such as electrical stimulation to support healing.

Nerve regeneration

Nerves heal and regenerate slowly, so it's important to be patient. While some symptoms might be better right away, others might improve over several weeks to months. It's common to experience gradual improvement in things like pain, tingling or weakness as nerves recover. This will vary from one person to another, and it helps to have realistic expectations.

Psychological support

Peripheral nerve disorders can affect your function and quality of life, which can be emotionally challenging. You might benefit from the support of family and friends or seeing a mental health professional such as a counsellor or psychologist.

Follow up care

You'll have follow-up visits with your surgeon and therapy team to monitor your progress and adjust your rehabilitation program as necessary. To help ensure a smooth recovery, make sure you follow your surgeon's guidelines, attend appointments, and let your healthcare team know if you have any concerns.

Importantly, many peripheral nerve disorders are chronic conditions that need ongoing management. Treatment often revolves around controlling the symptoms, maintaining your function, reducing any risk of complications, and helping you have the best possible quality of life.

Many people with a peripheral nerve disorder can benefit from having a multidisciplinary team involved in their care. In addition to a neurologist or neurosurgeon, this may include an orthopaedic surgeon, physiotherapist, occupational therapist, speech therapist, psychologist and more.

Your healthcare team will work with you and your loved ones to develop a personalised plan to help you recover and continue doing things that are important to you.

Sources

Information provided and reviewed by A/Prof Andrew Davidson, Neurosurgeon at Melbourne Private Hospital.

<https://www.healthdirect.gov.au/peripheral-nerve-diseases>

<https://medlineplus.gov/peripheralnervedisorders.html>

<https://pn.bmj.com/content/8/6/396>

<https://www.nhsinform.scot/illnesses-and-conditions/brain-nerves-and-spinal-cord/peripheral-neuropathy>

<https://www.nhs.uk/conditions/peripheral-neuropathy/>

<https://www.ninds.nih.gov/health-information/disorders/peripheral-neuropathy>

<https://medlineplus.gov/lab-tests/autonomic-testing/>