

Peripheral neuropathy

Peripheral neuropathy means damage to one or more of your peripheral nerves. The damage means that the messages that travel between your central and peripheral nervous system are disrupted. There are many different conditions that can lead to peripheral neuropathy.

Diabetes is the most common cause of persistent (chronic) peripheral neuropathy. The symptoms of peripheral neuropathy depend on which type of peripheral nerves are damaged (sensory, motor or autonomic nerves). Neuropathy can affect any one type, or a combination of all three types, of nerves. The aims of treatment for peripheral neuropathy are to treat any underlying cause, to control your symptoms and to help you to achieve maximum independence.

What is peripheral neuropathy?

Peripheral neuropathy describes damage to one or more of your peripheral nerves. The damage means that the messages that travel between your central and peripheral nervous system are disrupted.

Types of peripheral neuropathy

Peripheral neuropathy can be divided into:

- **Acute peripheral neuropathy** – this is a neuropathy of sudden, or rapid, onset.
- **Chronic peripheral neuropathy** – this develops more gradually and becomes persistent. Most peripheral neuropathy is chronic. It develops slowly over several months or years.

It can also be classified according to how many nerves are affected:

- **Mononeuropathy** – only one nerve is damaged.

- **Polyneuropathy** – multiple nerves are damaged.

Peripheral neuropathy symptoms

The symptoms of peripheral neuropathy depend on which type of peripheral nerves are damaged. Neuropathy can affect any one, or a combination of all three, types of nerves.

If sensory nerves are damaged, this is known as sensory neuropathy. It can cause symptoms in affected parts of your body including:

- Tingling and numbness.
- Loss of sensation:
 - Loss of ability to feel pain.
 - Loss of ability to detect changes in temperature.
- Loss of co-ordination – this is because you lose your joint position sense (the ability to determine the position of your joints).
- Burning or shooting pains – these may be worse at night and might be worse when something touches the skin, even if it is something very light such as a sheet lying on the legs at night.

Your feet and hands are often affected first in sensory neuropathy. This means that walking or picking up objects may become difficult. If not treated, the symptoms then gradually start to move towards the centre of your body as the neuropathy worsens.

If motor nerves are damaged, this is known as motor neuropathy. The stimulation of your muscles by your nerves is affected. It can cause symptoms in affected parts of your body, including:

- Muscle weakness – this can lead to problems such as falling and difficulty performing small movements such as buttoning your shirt. Sometimes you can develop weakness of your muscles around your chest and throat, causing breathing and swallowing problems.
- Muscle wasting (loss of muscle tissue due to lack of activity).
- Muscle twitching and cramps.

- Muscle paralysis (the muscle is unable to move at all and you don't have any control over it; you are unable to move a part of your body).

If autonomic nerves are affected, this is known as autonomic neuropathy. It can cause symptoms including:

- Dizziness and fainting (because of lack of blood pressure control, leading to low blood pressure).
- Problems with sweating - you have a reduced ability to sweat.
- Inability to tolerate heat.
- Loss of control over your bladder function, leading to incontinence of urine.
- Bloating, constipation or diarrhoea.
- Inability to get an erection (impotence).

Peripheral neuropathy causes

Many different conditions can lead to peripheral neuropathy. These include:

Diabetes

This is the most common cause of chronic peripheral neuropathy in Europe. The high blood sugar (glucose) levels in people with poorly controlled [diabetes](#) can lead to the nerve damage.

Entrapment neuropathy

Entrapment neuropathy occurs when a nerve becomes compressed between two other structures in the body. Entrapment neuropathy may:

- Start suddenly (acute) following injury, such as a sprain or fracture, that causes compression of a nerve.
- Start more gradually (chronic), usually caused by repetitive movement that affects an area where a nerve travels through a narrow space.

[Carpal tunnel syndrome](#) is the most common type of entrapment neuropathy.

Dietary deficiencies

[B12](#) or [folate vitamin](#) deficiencies can cause nerve damage and peripheral neuropathy.

Medicines

Certain medicines such as some [chemotherapy medication](#) and [medicines used to treat HIV](#) can cause damage to peripheral nerves.

Poisons (toxins)

Some toxins, such as insecticides or solvents (a problem for people who sniff glue), can cause peripheral nerve damage. In recent years this has become a particular issue for people who use amyl nitrate (poppers), which can cause serious and irreversible peripheral neuropathy.

Cancers

If you have certain cancers, you can develop peripheral neuropathy.

Alcohol excess

[Alcoholic neuropathy](#) is the name given to peripheral neuropathy that affects some people who drink large amounts of alcohol. The high alcohol levels in the body cause the nerve damage.

Chronic kidney disease

[Chronic kidney disease](#) can lead to an imbalance of salts and chemicals in the bloodstream and can cause peripheral neuropathy.

Injuries

These can put pressure directly on the nerves. Injuries can include broken bones and nerve compression injuries (for example, pressure placed on nerves by plaster casts, splints, braces).

Infections

Damage can be caused to peripheral nerves by some infections, including [shingles](#), [HIV infection](#) and [Lyme disease](#) (an infection caused after you are bitten by a tick infected with a specific germ (bacterium)). [Guillain-Barré syndrome](#) is the name given to a specific type of peripheral neuropathy that is usually triggered by an infection.

Connective tissue diseases

Conditions including [rheumatoid arthritis](#), [Sjögren's syndrome](#) and [systemic lupus erythematosus](#) can all lead to peripheral neuropathy in some people.

Inflammatory conditions

Conditions including [sarcoidosis](#) and [coeliac disease](#) can also cause peripheral neuropathy.

Hereditary diseases

Certain diseases that you can inherit from your parents can cause peripheral neuropathy. Two of the most common of these are Charcot-Marie-Tooth syndrome and Friedreich's ataxia.

Idiopathic peripheral neuropathy

In a few people, no specific cause is found for their peripheral neuropathy. This is known as idiopathic peripheral neuropathy.

How common is peripheral neuropathy?

About 2 in 100 people have some form of peripheral neuropathy. However, it becomes more common in people who have recognised risk factors (people who have an underlying condition or problem that is known to lead to peripheral neuropathy).

About half of people who have had diabetes for 25 years have peripheral neuropathy and in the UK it is estimated that around 10% of those who are aged 55 or over are affected by peripheral neuropathy. The higher numbers in older people are likely to be related to increases in the prevalence of diabetes.

When might peripheral neuropathy be diagnosed?

Peripheral neuropathy may be diagnosed because you may notice some of the symptoms described above and see your doctor because of this. Sometimes it may be discovered if your doctor examines you for another reason; for example, if you have a cut on your foot.

At other times peripheral neuropathy is diagnosed at a routine check-up for your diabetes. (If you have diabetes, you should undergo regular check-ups. These should also include an assessment to look for any signs of peripheral neuropathy.)

How is peripheral neuropathy diagnosed?

If your doctor suspects that you have peripheral neuropathy, he or she will usually ask you some questions. These will include questions about:

- Your symptoms.
- Your general health.
- Any history of neuropathy in your family.
- Any medicines that you may be taking.
- Any poisons (toxins) to which you may have been exposed.
- How much alcohol you drink.

They will then usually perform a physical examination of your nervous system to look for signs of peripheral neuropathy - for example, muscle weakness, numbness, etc.

Your doctor may suggest some [blood tests](#) to look for possible causes of peripheral neuropathy. For example, a [blood sugar \(glucose\) test](#) to look for diabetes, tests to check the levels of [vitamin B12 and folate](#) in your blood, a test of your [kidney function](#), etc.

He or she may suggest that you be referred to a nervous system specialist (a neurologist) for further assessment. The neurologist may suggest some other tests. These will depend on the suspected cause of the problem, as is suggested by your history and symptoms. They may include various blood tests, X-rays, scans, or other tests. Some common tests that are carried out include:

Nerve conduction testing

The nerve conduction test looks at the speed at which electrical signals pass through your nerves. Special electrodes are placed on your skin over the nerve being tested. They are a bit like the sticky electrodes used when you have a heart tracing (electrocardiogram, or ECG).

These electrodes give off very small electrical impulses that feel a bit like a small electric shock which stimulate your nerve. Other electrodes record the electrical activity of the nerve. The distance that the impulses travel to the other electrodes and the time that this takes allows the speed of the nerve impulse to be calculated. In peripheral neuropathy, this speed is reduced.

Electromyography

This test looks at the electrical activity of your muscles. A very thin needle with an electrode attached is inserted through your skin into a muscle. This is connected up to a recording machine called an oscilloscope.

You will then be asked to contract the muscle – for example, to bend your arm or your leg. The way that your muscle responds when it is stimulated by nerves can then be monitored using the oscilloscope and recorded. In peripheral neuropathy, the electrical activity will be abnormal.

A nerve biopsy

This is the removal of a small part of a nerve so that it can be examined under a microscope. A nerve around your ankle or your wrist is most commonly biopsied. A local anaesthetic is given. A small cut is made in your skin and a small portion of your nerve is removed.

A skin biopsy

This is a technique to examine the peripheral nerves. It can be used to look for early peripheral neuropathy and also to monitor progression of neuropathy and response to treatment. It can be performed anywhere on the body.

A local anaesthetic is used and an instrument takes a 'punch' biopsy from the skin (around 3 mm in diameter). No stitching is needed afterwards. The piece of skin is then examined under a microscope. Amongst other things, the density of nerve fibres in the area of skin is measured. In peripheral neuropathy, the density of the peripheral nerves is reduced.

Peripheral neuropathy treatment

The aims of treatment for peripheral neuropathy are:

- To treat any underlying condition or cause for your peripheral neuropathy.
- To control any symptoms that you may have.
- To help you to achieve maximum independence.

Treatment of any underlying cause

Any underlying condition causing peripheral neuropathy, such as diabetes or vitamin B12 deficiency, should be treated. If you have diabetes, it is very important to try to get your blood sugar (glucose) levels under very good control so as to avoid any further nerve damage.

If you have an injury causing peripheral neuropathy, this may need physiotherapy, surgery or other treatment so that the pressure on the nerve caused by the injury is relieved. If you have alcoholic neuropathy, reducing and stopping your alcohol intake will usually help to prevent any further nerve damage.

Control of any symptoms

Pain can be a problem for some people with peripheral neuropathy and can be difficult to treat. Various medicines are available that may help. These include [medicines that are commonly used to treat epilepsy \(anticonvulsant medicines\)](#) such as [pregabalin](#), [gabapentin](#) and [carbamazepine](#).

A group of antidepressant medicines called [tricyclic antidepressants](#) may also be helpful. Amitriptyline is commonly used. In addition to having antidepressant effects, these medicines have also been found to be helpful in pain control. [See the separate leaflet called Neuropathic Pain.](#)

Symptoms due to problems with your autonomic nerves may be more difficult to treat. Sometimes elastic stockings or a medicine called [fludrocortisone](#) (or other similar medicines) may be helpful if you have problems with low blood pressure.

Various medicines may help your digestion if you have problems with this. Eating small frequent meals, sleeping with the head of your bed raised, or other measures may also help.

If you have problems with your bladder function, manual expression of urine – pressing over your bladder with your hands – may be necessary.

Intermittent self-catheterisation is another method to help with bladder function. It means that you insert a thin plastic tube (a catheter) into your bladder, to enable your urine to flow out. There are also various medicines which may be needed to help with bladder function.

Medication and other treatments are also available to treat inability to get an erection ([impotence](#)).

Treatment to help you achieve maximum independence

If you have severe peripheral neuropathy, you may need some aids to help with your day-to-day activities. For example, if you have leg or arm weakness you may need:

- A walking stick.
- Crutches.
- A walking frame.
- A wheelchair.
- Foot braces.
- A wrist splint.

A physiotherapist may be the best person to help you with such aids. They may also be able to advise you about exercises to help to improve your muscle strength.

An occupational therapist may be able to advise you about special utensils and home adaptations to help with muscle weaknesses.

Other things that may help

If you know that you have a peripheral neuropathy affecting your sensation, you are more prone to injuries. This is because pain usually helps to protect you against certain injuries.

If you have numbness or loss of ability to detect hot or cold, you may not experience the pain when you step on a sharp object or when you pick up something too hot. Therefore, you should:

- Always make sure that you wear sensible and supportive shoes or boots.
- Don't walk with bare feet.
- Examine your feet regularly to look for injuries. Untreated injuries can become infected.
- Visiting a podiatrist (previously called a chiropodist) regularly may also be helpful.
- Avoid using hot water bottles.
- Take care that the water in your bath is not too hot – test it before you get in.

Lack of muscle control in motor neuropathy can also make you more prone to falling and other injuries. Remove loose objects or obstacles such as rugs in your home to reduce your chance of tripping.

Preventing peripheral neuropathy

Everyone can reduce their risk of peripheral neuropathy by having a [sensible alcohol intake](#) within medical guidelines. A healthy balanced diet is also important to prevent dietary deficiencies.

[Type 2 diabetes is the most common cause of persistent \(chronic\) peripheral neuropathy](#). Diabetes is more common in people who are overweight or obese. Therefore, weight control may help to reduce your risk of developing diabetes.

If you do develop diabetes or another medical problem that can cause peripheral neuropathy, good control of the condition may help to prevent neuropathy from developing.

What is the outlook for peripheral neuropathy?

The outlook (prognosis) for peripheral neuropathy depends on the underlying cause. In general, if a problem can be identified early and treated successfully, the prognosis is very good. However, in severe neuropathy, even if the underlying cause is found and treated, nerve damage can be permanent.

Some anatomy of the nervous system

Your nervous system is divided into your central nervous system and your peripheral nervous system.

Your **central nervous system** includes your brain and spinal cord.

Your **peripheral nervous system** is the network of nerves, called peripheral nerves, that transmit information from your brain and spinal cord to all the other parts of your body, including your arms, legs and organs.

Your peripheral nerves also act as 'messengers' to transmit information back to your spinal cord and brain. For example, say you pick up something too hot, or your feet or fingers are too cold. If your peripheral nerves are damaged in some way, the information that passes along them becomes mixed up or doesn't get through at all to your central nervous system.

Your peripheral nerves can be divided into 'sensory' nerves, 'motor' nerves and 'autonomic' nerves.

- **Sensory nerves.** Electrical impulses transmitted along your sensory nerves allow you to touch and feel sensations such as heat, cold and pain.
- **Motor nerves** link up with your muscles. Electrical impulses that pass along these nerves stimulate your muscles to move.
- **Autonomic nerves** are nerves that carry information to your organs and glands. They help to control some of your bodily functions that are not consciously directed. For example, the regular beating of your heart, your breathing, your bowel movements, sweating and your blood pressure control.

Further reading

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Originally Published: 24/02/2024	Next review date: 15/01/2024	Document ID: doc_12406

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