

Understanding Peripheral Neuropathy and Cancer

A guide for people affected by cancer

This fact sheet has been prepared to help you understand more about the nerve condition known as peripheral neuropathy, which sometimes happens because of cancer or cancer treatment. We hope this fact sheet will help you, your family and friends understand what peripheral neuropathy is and how it can be managed.

What is peripheral neuropathy?

Peripheral neuropathy is damage to the peripheral nerves. These are the nerves located away from the centre of the body, such as in the hands and feet (see diagram at right). Unlike other cells in the body, nerve cells are not easily repaired or replaced once they are badly damaged.

People affected by peripheral neuropathy may experience different symptoms, depending on which peripheral nerves are damaged. No two cases are exactly the same.

Most often, the nerve damage causes numbness, tingling (“pins and needles”) or pain in the hands and feet. If the condition worsens, these symptoms may start to spread further up the arms and legs.

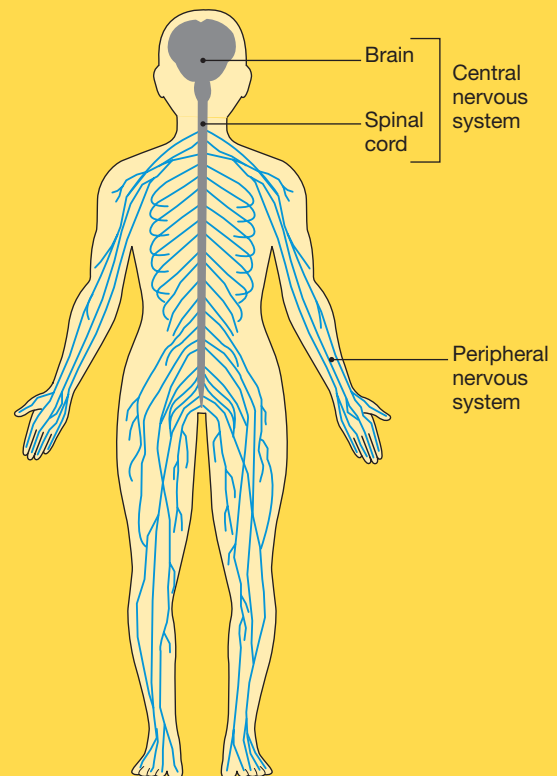
Other symptoms may include muscle weakness, dizziness, balance problems, trouble sensing where your body is in space, ringing in the ears, hearing loss and constipation (see page 3 for a more detailed list).

Peripheral neuropathy symptoms range from mild to severe, they can appear during or after treatment, and they may be temporary or permanent. In more severe cases, the symptoms of peripheral neuropathy can greatly affect a person’s quality of life, but there are usually ways to manage any changes (see pages 5–6 for tips).

About the nervous system

The nervous system controls everything your body does. It has two main parts:

- **central nervous system** – the brain and spinal cord
- **peripheral nervous system** – a network of nerves that carry messages between the brain and spinal cord, and the body.



How nerves work

- Nerves are made up of nerve cells called neurons.
- When a nerve ending is stimulated, a tiny electrical signal is sent from neuron to neuron, eventually reaching the spinal cord and brain.
- When a peripheral nerve is damaged (e.g. by chemotherapy), the electrical signals may be blocked or mixed up. This can lead to a wide range of symptoms.

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What causes this nerve damage?

Some types of chemotherapy that are used to treat cancer can damage peripheral nerves. If this side effect occurs, you may hear it called chemotherapy-induced peripheral neuropathy (CIPN). Sometimes, other cancer treatments and the cancer itself can cause peripheral neuropathy.

Possible cancer-related causes of peripheral neuropathy include:

- certain chemotherapy drugs, particularly taxanes (e.g. docetaxel, paclitaxel), platinum drugs (e.g. carboplatin, cisplatin, oxaliplatin) and vinca alkaloids (e.g. vincristine)
- some other cancer drugs, such as thalidomide, bortezomib and brentuximab vedotin
- some types of cancer, especially lung cancer, myeloma and lymphoma
- tumours pressing on nerves
- bones breaking down and causing swelling that presses on nerves
- surgery or radiation therapy damaging nerves.

It's not just cancer that causes peripheral neuropathy. Other factors that may damage nerves include diabetes, shingles, heavy use of alcohol and other drugs, and a lack of certain vitamins and minerals (especially vitamin B). These factors may also increase your risk of having peripheral neuropathy after a cancer diagnosis. Smoking is another factor that can increase the risk.

How common is peripheral neuropathy after chemotherapy?

The main cause of peripheral neuropathy in people affected by cancer is treatment with certain chemotherapy drugs (see above). For these types of chemotherapy, about 7 out of 10 people will experience some symptoms one month after treatment, and 3 out of 10 people will still have symptoms six months after treatment. The risk differs between different chemotherapy drugs.

Will it get better?

Some types of chemotherapy cause short (acute) episodes of peripheral neuropathy during or shortly after the cancer treatment session. These episodes tend to last a few days.

For other types of chemotherapy, peripheral neuropathy may be longer-lasting (chronic). It can start during treatment and is more likely to occur the more treatment cycles you have had. In some cases, peripheral neuropathy can develop or get worse over time, even after treatment has finished.

After the end of cancer treatment, peripheral neuropathy symptoms may begin to improve over 6–12 months.


In some people, symptoms are permanent and may be severe. This is more likely if you have had intensive treatment, such as high-dose chemotherapy, or if you have diabetes or other risk factors for peripheral neuropathy.

Can it be prevented?

So far, no treatment has been proven to prevent peripheral neuropathy. However, if you start having symptoms during chemotherapy treatment, your doctor may reduce the doses of chemotherapy drugs or give them to you further apart. This adjustment sometimes allows the nerves to recover and prevents permanent damage.

In some cases, you may need to stop having a particular chemotherapy drug. You can talk to your doctor about how they will balance the risk of changing the chemotherapy plan against the risk of the nerve damage becoming permanent.

Researchers are studying whether wearing ice mitts and ice booties during chemotherapy treatment could help prevent the cell damage that causes peripheral neuropathy. However, there is not yet enough evidence that this works. Talk to your treatment team for more information.



Although there is no way to prevent peripheral neuropathy developing, you may be able to reduce your risk. If you have diabetes, it will be important to make sure the diabetes is well managed throughout your cancer treatment. Limiting how much alcohol you drink and not smoking may also lower the risk.

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Symptoms of peripheral neuropathy

Peripheral neuropathy is a complex condition that can cause many different symptoms. This is because the damage can be to any part of the peripheral nervous system, which includes sensory nerves, motor nerves and the autonomic nervous system. Often more than one type of nerve is affected. Symptoms are usually mild in the beginning, but get worse over time for some people.

	What these nerves do	Symptoms of damage
sensory nerves	These send messages from the body to the brain, carrying information about pain, temperature, touch, vibration, and where the body is in space (important for balance and coordination).	<ul style="list-style-type: none"> • not being able to feel hands or feet (numbness) • tingling (“pins and needles”) in hands or feet • pain in hands or feet – these may be burning or shooting pains, “like walking on hot sand” • feeling light touch as pain, especially at night • confusion about temperature, e.g. feeling heat as cold, or not being able to tell if something is hot or cold • loss of awareness of where your body is in space, making you feel clumsy, especially when walking on uneven surfaces • trouble keeping your balance when walking • loss of hearing, or ringing in the ears (tinnitus)
motor nerves	These carry messages from the brain to the muscles to control movement.	<ul style="list-style-type: none"> • finding it hard to do up buttons or pick up small objects • trouble walking up stairs or getting up out of a chair • muscle loss • weakness, e.g. not being able to open a jar • cramps • muscles twitching under skin • poor handwriting • unsteady way of walking (gait)
autonomic nervous system	This carries messages between the internal organs and the brain. It controls processes that happen automatically, including blood pressure, heart rate, temperature control, digestion, and bowel and bladder functioning.	<ul style="list-style-type: none"> • constipation • feeling bloated • diarrhoea • dizziness when changing position from lying down to sitting up, or from sitting to standing • blurred vision • trouble getting or keeping an erect penis

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How peripheral neuropathy can affect you

Peripheral neuropathy can affect a person's quality of life in many ways. The impact varies from one person to another, but it can include:

- discomfort and pain from physical symptoms
- trouble completing everyday tasks (such as doing up buttons) because of finger numbness and loss of fine motor control
- high risk of scalds and cuts because of numbness – in addition, chemotherapy often lowers your resistance to infection, so minor burns and cuts can quickly become serious
- risk of not noticing injuries, which may become more serious because they aren't treated promptly
- difficulty walking because you have numbness or pain in your feet, you find it hard to keep your balance and/or you can't sense where your feet are in relation to the ground
- high risk of falls because of numb feet, dizziness, balance problems and difficulty sensing where your body is in space
- poor sleep because of shooting pains
- not being able to drive because of numb feet and difficulty sensing where your body is in space
- not being able to return to work or other activities
- feeling isolated if it is hard to move around
- money issues because of health care costs
- feeling that you have lost your independence.



It is important to tell your treatment team if you start having any symptoms of peripheral neuropathy or notice a change in your symptoms. Adjusting your cancer treatment may allow the nerves to recover and avoid permanent damage. Your team can also check whether anything else is causing the symptoms.

Diagnosing peripheral neuropathy

If you are having chemotherapy that has a high risk of causing nerve damage, your treatment team will monitor you closely for early signs of peripheral neuropathy. In other cases, peripheral neuropathy may be diagnosed after you report symptoms to your cancer specialist or general practitioner (GP).

If your doctor suspects that you have peripheral neuropathy, they will check how the symptoms affect your daily life and may ask you to complete a symptom checklist. The doctor may also check your:

- **awareness of where your body is** – you close your eyes and answer questions about the position of parts of your body
- **reflexes** – your ankles, knees and wrists are tapped with a small hammer to check their automatic movement
- **balance and coordination** – you may be asked to walk in a straight line or balance on one leg
- **blood pressure** – your blood pressure is measured when you are lying down and standing up to see if there is a difference.

In some cases, your cancer specialist or GP may refer you to a neurologist, a specialist doctor who diagnoses and treats diseases of the nervous system. They may arrange special tests known as nerve conduction studies, which check how many cells are working and how quickly they send electrical signals along to the next cells.

Based on your symptoms and test results, your doctors may give the peripheral neuropathy a grade. Different grading systems are used in Australia, but a common one has grades 1 to 3, with grade 3 being the most severe and needing urgent attention.

Treating peripheral neuropathy

If symptoms appear, the only known way to stop chemotherapy-induced peripheral neuropathy from getting worse is to change how much or how often you have chemotherapy. In severe cases, chemotherapy may need to be stopped altogether. If peripheral neuropathy is caused by the cancer itself, symptoms may ease once the cancer is treated, but sometimes the damage is permanent.

You may be worried about telling your treatment team that you have symptoms of peripheral neuropathy because you want to complete the cancer treatment. But not speaking up about your symptoms could mean that more of the nerve is damaged and symptoms that could be reversed end up becoming permanent. If your doctor recommends pausing or stopping the chemotherapy, they will talk to you about other ways to treat the cancer.

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Managing symptoms

A range of health professionals can help you manage peripheral neuropathy (see table below).

Medicines to manage symptoms

Doctors use various medicines to help relieve the symptoms. These may include:

- **pain medicines** – you can try over-the-counter painkillers (e.g. paracetamol, ibuprofen) but these often don't help much; your doctor may prescribe stronger pain medicines (e.g. tramadol), but the side effects may mean that these are not a good long-term solution
- **duloxetine** – sometimes this antidepressant is recommended for managing peripheral neuropathy; while some studies have shown that it helps relieve numbness, tingling and pain, other studies have found no benefit
- **other drugs** – because treatment options are limited, some other types of antidepressants, the anticonvulsant gabapentin, and the topical creams capsaicin or lignocaine are sometimes recommended by doctors to relieve symptoms such as pain, but the evidence is not clear
- **laxatives or stool softeners** – these can help manage constipation.

Other ways to manage symptoms

Although there are few medicines that can help with peripheral neuropathy, there are other ways to relieve symptoms and reduce the risks.



Self-care – There are a number of simple things you can do to help manage peripheral neuropathy. See *Tips for looking after yourself* on the next page.



Exercise – Exercise is recommended to strengthen muscles, improve circulation, reduce pain and cramps, and improve balance. A physiotherapist or exercise physiologist can help develop an exercise program for you that can improve your strength, balance and mobility, and possibly reduce your peripheral neuropathy symptoms as well.



Equipment – To help manage daily tasks and reduce the risk of falls, an occupational therapist can recommend appropriate aids and equipment (e.g. special shoes) and strategies (e.g. using visual cues when walking over uneven ground). They may also try a desensitisation program, gradually introducing different textures to encourage normal use of your hands.



Foot care – Peripheral neuropathy can make it difficult to look after your feet. A podiatrist is a trained health professional who can trim your toenails; treat any skin problems, such as blisters and corns; and check your feet for injuries you may not have noticed.



Pain relief without medicine – Nerve pain can sometimes be relieved with massage, while learning relaxation techniques can help people manage pain and discomfort. Acupuncture, TENS (transcutaneous electrical nerve stimulation, a device that sends small electrical currents to parts of the body) and certain dietary supplements are being tested in clinical trials to see whether they help with peripheral neuropathy related to cancer. Some people find magnesium cream and tablets can help ease muscle cramps in the feet and lower legs.



Psychology and counselling – A psychologist can teach relaxation, meditation and other techniques to help with managing pain. A counsellor or psychologist can also help people adjust to any lifestyle changes caused by peripheral neuropathy.

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Tips for looking after yourself

Many people find ways to adapt to life with peripheral neuropathy. These suggestions may help reduce the impact of the symptoms on your quality of life:

Protect hands and feet

- Wear gloves when washing the dishes or gardening.
- Use heatproof potholders when cooking.
- Test water temperature with your elbow.
- Keep hands and feet warm.
- Moisturise hands and feet and keep nails trimmed.
- Make sure your shoes fit well.

Manage constipation

- Do some physical activity (such as walking) daily.
- Eat plenty of fruit, vegetables and other foods rich in fibre.
- Drink plenty of fluids.
- Take laxatives as prescribed.

Prevent dizziness

- Take your time standing up.
- Drink plenty of fluids.
- Wear support stockings during the day to improve your circulation.
- Sit down when brushing teeth or putting on shoes.

Avoid falls

- Keep rooms well lit.
- Reduce clutter and remove loose rugs.
- Use non-slip mat in shower and bath.
- Place rails on stairs and in bathrooms.
- Talk to your doctor about falls prevention programs.

Improve sleep

- Try silk or bamboo sheets if your feet are sensitive.
- Use a special frame to keep sheets off your feet.

Check about driving

- Ask your doctor whether it is safe for you to drive.

Questions for your doctor

This checklist may be helpful when thinking about the questions you want to ask your doctor.

- Am I likely to develop peripheral neuropathy?
- What symptoms should I watch out for?
- Who should I contact if I start having symptoms?
- Could these symptoms be a sign that I'm starting to develop peripheral neuropathy?
- Should my chemotherapy be adjusted or stopped? If so, how else can the cancer be treated?
- How long are these symptoms likely to last?
- What treatments do you recommend for the pain?
- How can I manage the constipation?
- How can I reduce my risk of falls or other injuries?
- What aids and equipment might help me? Can you refer me to an occupational therapist?
- What type of exercise should I do? Can you refer me to a physiotherapist or exercise physiologist?
- Could a psychologist help me cope with this?
- Are there any clinical trials I could join?

Where to get help and information

Call Cancer Council **13 11 20** for more information and free copies of our booklets, or visit your local Cancer Council website:

ACT..... actcancer.org
 NSW cancercouncil.com.au
 NT nt.cancer.org.au
 QLD cancerqld.org.au
 SA..... cancersa.org.au
 TAS cancertas.org.au
 VIC..... cancervic.org.au
 WA..... cancerwa.asn.au
 Australia..... cancer.org.au

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Note to reader: Always consult your doctor about matters that affect your health. This fact sheet is intended as a general introduction and is not a substitute for professional medical, legal or financial advice. Information about cancer is constantly being updated and revised by the medical and research communities. While all care is taken to ensure accuracy at the time of publication, Cancer Council Australia and its members exclude all liability for any injury, loss or damage incurred by use of or reliance on the information provided in this fact sheet.



For information and support on cancer-related issues, call Cancer Council **13 11 20**. This is a confidential service.