

Diabetic neuropathy

Neuropathy means nerve damage. Diabetic neuropathy is nerve damage caused by high blood glucose levels. It most commonly affects the nerves to the feet, but any nerves can be involved including those that control internal organs.

Estimates suggest that up to 60 per cent of people with diabetes have some degree of neuropathy, but many (about 40 per cent) do not have symptoms. There is no cure. Treatment aims to ease symptoms and reduce the risk of further complications.

Symptoms of diabetic neuropathy

Most people with diabetic neuropathy have no symptoms and are unaware that they have the condition, so annual check-ups are essential. When symptoms do occur, they may include:

- Reduced ability to feel pain in the feet
- Unpleasant sensations in the feet such as numbness, tingling, shooting or burning pains
- Injuries to the feet that go unnoticed and therefore untreated
- Altered walking style
- Digestion problems
- Heart problems
- Erection problems in men
- Loss of muscular strength (rarely, only in severe cases).

Peripheral nerves explained

The nerve tissue outside of the brain and spinal cord is called the peripheral nervous system. Diabetic neuropathy affects peripheral nerves, which include:

- **Sensory nerves** – these send information to the brain about the outside world, including temperature, texture or pain. Damaged sensory nerves can cause unpleasant tingling, ‘pins and needles’ and numbness. The toes and feet tend to be affected first. This type of neuropathy is called peripheral neuropathy or distal symmetric neuropathy.
- **Motor nerves** – these send messages from the brain and spinal cord to muscles, enabling voluntary movement such as walking or grasping objects with the hands. Damaged motor nerves can cause a loss of strength. However, diabetes does not usually cause significant problems with motor nerves.
- **Autonomic nerves** – these regulate the functioning of organs and glands without our conscious effort. For example, autonomic nerves control heart rate, blood pressure and digestion. Damaged autonomic nerves can cause a range of problems depending on which nerves are affected. This type of neuropathy is called autonomic neuropathy.

Neuropathic ulcer

A neuropathic ulcer is a common complication of peripheral neuropathy. About 15 per cent of people with diabetes will develop a neuropathic ulcer at least once. The feet are most commonly affected. Nerve damage means the person can no longer feel pain in their feet. Untreated, a small injury can rapidly worsen into an open sore, which is typically surrounded by a ring of callused skin. Diabetes is the most common reason for surgical amputation of the foot.

The cause of diabetic neuropathy is unclear

It is unclear why diabetes should damage peripheral nerves. Studies have found that strict control of blood glucose levels reduces the risk of neuropathy but doesn't eliminate it altogether. This suggests that other factors may contribute to the nerve damage. It is known that disorders other than diabetes can cause neuropathy (such as some autoimmune diseases or infectious diseases), so scientists believe that genetic and environmental factors work together to cause diabetic neuropathy.

Risk factors for diabetic neuropathy

Generally speaking, the longer a person has diabetes and the worse their control of their diabetes, the higher their risk of developing diabetic neuropathy.

Diagnosis of diabetic neuropathy

Diagnosis of diabetic neuropathy may include:

- Medical history
- Physical examination
- Blood tests to check glucose levels
- Neurological tests to check responses to stimuli such as temperature, touch and vibration
- Tests to exclude other possible causes of neuropathy.

Treatment for diabetic neuropathy

Damaged nerves cannot be repaired. Treatment can only ease the symptoms and reduce the risk of further complications. Options may include:

- Education about how to look after your feet and what shoes to wear, in order to prevent ulcers
- Medication, diet and careful exercise to help control blood glucose levels
- Drugs to manage pain, including analgesics or antidepressants
- If needed, care by a podiatrist to treat a neuropathic ulcer – treatment may include special dressings and antibiotics.

Prevention of diabetic neuropathy

Be guided by your doctor, but general suggestions to reduce the risk of diabetic neuropathy include:

- Maintain your blood glucose levels within the recommended ranges.
- Exercise regularly.
- Maintain a healthy weight for your height.
- Don't smoke.
- Limit your alcohol consumption (if you drink alcohol) to no more than two standard drinks per day.. Address other health concerns such as high blood cholesterol or high blood pressure, as these conditions are thought to increase the risk of diabetic neuropathy.
- See your doctor promptly if you have symptoms including pain, numbness or tingling in your hands or feet.
- Have your feet checked yearly by your doctor, podiatrist or diabetes educator.

Where to get help

- Your doctor
- Podiatrist
- Diabetes educator
- An Accredited Practising Dietitian, contact the Dietitians Association of Australia
- Quitline Tel. 13 7848 (13 QUIT)
- Diabetes Australia Victoria Tel. 13 RISK (13 7475)
- Baker IDI Heart and Diabetes Institute Tel. (03) 9258 5000

Things to remember

Diabetic neuropathy is nerve damage caused by high blood glucose levels. The nerves of the feet are most commonly affected by diabetic neuropathy. Many people with diabetic neuropathy do not have any symptoms, so annual examinations are essential. See your doctor promptly if you have symptoms including pain, numbness or tingling in your hands or feet.

This page has been produced in consultation with, and approved by:

Baker IDI Heart and Diabetes Institute

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