CONDITION

Diabetic neuropathy

Diabetic neuropathy is nerve damage caused by the long-term effects of diabetes.

WHAT IT IS
Diabetes-related damage to peripheral and autonomic nerves

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
Numbness, tingling, burning pain, weakness

WHAT CAUSES IT
Long-term metabolic and blood vessel effects of diabetes

HOW IT IS DIAGNOSED
Neurological examination, with tests excluding other causes

MAIN TREATMENT
Diabetes management, symptom control, and foot protection

CAN IT BE CURED?
No - established nerve damage may persist

IS IT AN EMERGENCY?
Sometimes - with blackened tissue or rapidly spreading foot infection

LONG-TERM OUTLOOK
Often manageable, but numbness and nerve damage may progress

Overview

Diabetic neuropathy is nerve damage linked to diabetes. It can affect nerves that carry sensation, control muscles, or manage automatic body functions such as heart rate, digestion, bladder control, and sweating.

The most common form affects nerves in the feet and legs. It usually starts in the toes and may gradually spread upward. The hands can become affected later. This pattern is called distal symmetric polyneuropathy.

Other forms can affect the nerves supplying internal organs, a single nerve, or the muscles around the hips and thighs. A person may have more than one type.

Diabetic neuropathy matters because reduced feeling can allow a cut, blister, or pressure injury to go unnoticed. Nerve damage may also cause ongoing pain, affect balance, or interfere with

digestion, blood pressure, sexual function, and bladder control.

Established nerve damage is not usually curable. However, managing diabetes and related health risks may slow further damage. Pain and other symptoms can often be treated, and careful foot protection can reduce complications.

Symptoms

Symptoms depend on which nerves are affected. Some people have no obvious symptoms, especially early on.

Nerve damage in the feet and legs may cause:

Symptoms often affect both feet and may be worse at night. As numbness spreads, pain does not always become more severe. A foot can feel less painful even while loss of protective sensation is increasing.

Autonomic neuropathy affects nerves that manage automatic body functions. Symptoms can include dizziness or faintness after standing, a resting heartbeat that stays unusually fast, or reduced awareness of low blood glucose. Digestive effects may include nausea, bloating, constipation, diarrhoea, or food moving slowly out of the stomach.

Bladder problems can include difficulty emptying the bladder or leaking urine. Sexual effects may include erection problems, vaginal dryness, or changes in sexual response. Sweating may increase or decrease in certain areas.

Less common forms may cause sudden pain or weakness in one thigh, hip, chest, abdomen, face, or hand. These symptoms need assessment because other conditions can cause similar problems.

- Numbness or reduced ability to feel pain, heat, or cold
- Tingling, burning, stabbing, or electric-shock-like pain
- Extreme sensitivity, including pain from light touch or bedsheets
- Muscle weakness, unsteadiness, or loss of ankle reflexes

Causes and risk factors

Diabetic neuropathy develops through a combination of metabolic changes and damage to the small blood vessels that supply nerves. Blood glucose that remains above a person's target over time is an important factor, but it is not the only one.

Risk generally increases with a longer duration of diabetes. Neuropathy can occur in both type 1 and type 2 diabetes, and it may already be present when type 2 diabetes is diagnosed.

Other factors linked with a higher risk include high blood pressure, unhealthy cholesterol levels, kidney disease, smoking, and excess body weight. Heavy alcohol use can also damage nerves independently of diabetes.

Not every nerve symptom in someone with diabetes is diabetic neuropathy. Vitamin B12 deficiency, thyroid problems, alcohol-related nerve damage, trapped nerves, some medicines, infections, and other neurological conditions can produce similar symptoms.

Diagnosis

There is no single test that proves every case of diabetic neuropathy. Diagnosis usually combines your symptoms, diabetes history, a neurological examination, and tests used to rule out other causes.

During an examination, a healthcare professional may check:

Blood tests may check for other possible causes, such as vitamin B12 deficiency, thyroid disease, or kidney problems. Your current level of glucose management may also be reviewed.

Nerve conduction studies measure how quickly electrical signals travel through nerves. Electromyography measures electrical activity in muscles. These tests are not always needed for the usual symmetrical pattern in both feet. They may be considered when symptoms start suddenly, affect one side, mainly involve weakness, or do not follow the expected pattern.

Tests of heart rate, blood pressure, sweating, digestion, or bladder function may be used when autonomic neuropathy is suspected.

- Feeling from light touch, pinprick, temperature, or vibration
- Protective sensation using a thin nylon filament
- Muscle strength, reflexes, walking, and balance
- Foot shape, skin condition, circulation, and any wounds

Treatment and management

Treatment aims to slow further nerve damage, ease symptoms, maintain function, and protect areas with reduced sensation.

Managing blood glucose is central. Your personal target should account for factors such as

your age, other health conditions, medicines, and risk of low blood glucose. Blood pressure, cholesterol, kidney health, smoking, physical activity, and nutrition may also form part of your care plan.

Improving glucose levels does not reliably reverse established nerve damage. Rapid, large changes in glucose levels can occasionally be followed by a painful form of neuropathy, so changes should be planned with your diabetes team.

Several types of medicine can reduce neuropathic pain. Options include certain antidepressants like sertraline or fluoxetine , anti-seizure medicines that calm nerve signals, and topical treatments applied to the skin. These medicines are being used for their effects on pain pathways; being offered an antidepressant does not mean the pain is considered psychological.

No pain medicine works for everyone. Choice is influenced by other conditions, side effects, interactions, sleep, and how the pain affects daily life. Long-term opioid treatment is generally avoided because its risks often outweigh its benefit for diabetic nerve pain.

Autonomic symptoms need treatment tailored to the affected body function. This may include measures for blood pressure drops, digestive symptoms, bladder problems, or sexual difficulties. If the stomach empties slowly, diabetes medicines and meal planning may need review because food and glucose-lowering treatment can take effect at different times.

Foot protection is especially important when sensation is reduced. Check your feet regularly, including between the toes and under the soles. Look for blisters, cracks, redness, swelling, drainage, or changes in skin colour. Wear well-fitting shoes and avoid walking barefoot.

A podiatrist can help with calluses, nail care, footwear, and pressure relief. Do not cut corns or calluses yourself or use chemical corn removers on numb skin.

Complications

Reduced sensation can allow repeated pressure or a small injury to develop into a foot ulcer. Poor circulation and infection can make healing more difficult. Severe tissue damage may sometimes require surgery or amputation, but early foot care and prompt treatment of wounds can reduce this risk.

Loss of balance and muscle strength may increase the chance of falls. Changes in foot joints and bones can occasionally lead to Charcot foot, in which the foot becomes warm, swollen, and unstable, sometimes with little pain.

Autonomic neuropathy may contribute to fainting, unpredictable digestion, bladder infections, sexual difficulties, and reduced warning symptoms during low blood glucose. Nerve damage

affecting the heart and blood vessels is also associated with a higher risk of cardiovascular problems.

Prevention

Diabetic neuropathy cannot always be prevented. Some people develop it despite careful diabetes management.

Keeping blood glucose within an agreed target can reduce the risk or slow progression, particularly when good management begins early. Managing blood pressure and cholesterol, not smoking, limiting alcohol, and staying physically active can also support nerve and blood vessel health.

Foot checks do not prevent the nerve damage itself. They help prevent numbness from leading to ulcers, infection, and other complications.

Regular diabetes reviews should include assessment for nerve damage and foot risk. The timing and type of assessment may differ according to your type of diabetes, symptoms, and previous foot problems.

Living with it and what to expect

Diabetic neuropathy often develops gradually over months or years. Numbness may remain stable for a time or slowly spread. Pain can fluctuate and may improve with treatment, even when loss of sensation remains.

Some focal nerve problems improve over weeks or months. More widespread neuropathy is more likely to be long term. How it progresses is influenced by glucose management, other health conditions, circulation, and the type of nerves involved.

Many people remain active and independent. Supportive footwear, balance or strength exercises, physical therapy, and changes at home may help if sensation or stability is affected. Exercise is usually possible, but activities may need adapting if you have an ulcer, major loss of sensation, or a foot deformity.

Keep attending routine diabetes and foot reviews even if pain settles. Less pain does not necessarily mean that protective sensation has returned.

When to get medical help

Arrange a routine appointment if you develop ongoing tingling, burning, numbness, unexplained weakness, balance problems, digestive changes, or dizziness when standing. New bladder or sexual symptoms also deserve assessment. These symptoms may have causes other than diabetic neuropathy.

Seek prompt, same-day medical advice for:

Seek emergency care for blackened or blue tissue, a cold and pale foot, rapidly spreading infection, severe illness with confusion or difficulty staying awake, or sudden weakness of the face, arm, or leg. Sudden speech difficulty, chest pain, or fainting also requires emergency assessment rather than being assumed to be neuropathy.

- A new blister, cut, ulcer, or drainage from a foot
- A foot that becomes red, warm, swollen, or changes shape
- Spreading redness, increasing swelling, or signs of infection
- A wound that is not beginning to heal
- New weakness or rapidly worsening sensation

Common questions

Can diabetic neuropathy be reversed?

Established nerve damage is not usually fully reversible. Better diabetes management may slow further damage, and pain or autonomic symptoms may improve with treatment. A treatable problem such as vitamin B12 deficiency may also be contributing, which is why assessment matters.

Does tingling in my feet always mean diabetic neuropathy?

No. Trapped nerves, vitamin deficiencies, thyroid disease, alcohol, some medicines, circulation problems, and other neurological conditions can cause similar symptoms. New or changing symptoms should be assessed rather than assumed to come from diabetes.

Why is diabetic nerve pain worse at night?

Pain may feel more noticeable when you are resting and there are fewer distractions. Light pressure from bedding can also trigger oversensitive nerves. Night-time pain is common, but it does not confirm the diagnosis by itself.

Can I exercise with diabetic neuropathy?

Many people can exercise safely and benefit from activity. Well-fitting footwear and foot checks are important. If you have an ulcer, severe numbness, poor balance, or Charcot foot,

seek advice about low-pressure activities and any temporary restrictions.

Will diabetic neuropathy lead to amputation?

Most people with neuropathy do not have an amputation. Risk rises when numbness, pressure, poor circulation, ulcers, and infection occur together. Regular foot care and early treatment of any wound are important ways to lower that risk.

Can neuropathy affect blood glucose warnings?

Yes. Autonomic nerve damage can reduce early warning symptoms of low blood glucose, such as shaking or a fast heartbeat. If your warnings have changed, discuss glucose monitoring and treatment safety with your diabetes team.

Sources

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