

Complications of diabetes

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- What is diabetic retinopathy?
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What is diabetic neuropathy?

Diabetic neuropathy is a type of nerve damage caused by diabetes.¹ High blood sugar levels injure small blood vessels supplying the nerve fibres, leading to nerve damage.² Nerve fibres throughout the body can be damaged, but this condition commonly affects nerves in the legs and feet.¹



Although diabetic neuropathy is a serious complication, it can be prevented, or its progression can be slowed with good blood sugar control and a healthy lifestyle.¹

What are the symptoms of diabetic neuropathy?

Symptoms depend on:

- The type of neuropathy
- The affected nerves

Main types of neuropathy:

1. Sensory

- Damage to the nerves which detect touch, temperature and pain. Commonly affects the feet and legs, but can also affect the arms and hands²
- Symptoms^{2,3}:
 - Tingling and prickling sensation (pins and needles)
 - Numbness, reduced ability to feel pain (or) temperature changes
 - Loss of coordination
 - Burning or shooting pains
 - Pain from stimuli that do not usually cause pain at all, eg, light touch
- Loss of feeling in the feet—not realizing this is dangerous, because minor injuries may go unnoticed. Untreated minor injuries can progress to infections, ulcers or gangrene. Infections that spread and cause tissue death can become untreatable and may require toe, foot or lower leg amputation^{1,2}



2. Autonomic

- Affects the nerves to your organs and glands which control involuntary actions such as digestion, heart rate, sexual function²
- Can lead to^{1,2}:
 - Slow stomach emptying. Symptoms include bloating, nausea, vomiting, loss of appetite, constipation or diarrhoea
 - Inability to control the bladder
 - Irregular heart rate
 - Excessive or reduced sweating
 - Erectile dysfunction
 - Problems with body temperature regulation
 - Lack of awareness of low blood sugar levels
 - Low blood pressure, making you feel faint or dizzy after sitting or standing



3. Motor

- Damage to nerves controlling muscle movement²
- Can lead to^{2,3}:
 - Muscle weakness, resulting in falls or problems with tasks
 - Muscle thinning, whereby the lack of activity causes loss of muscle tissue
 - Muscle twitching and cramps
 - Foot drop, ie, difficulty lifting the front part of the foot

How do I watch out for diabetic neuropathy?

If diabetic neuropathy is diagnosed and treated early, the chances of controlling symptoms and limiting the damage are better. Stay alert for signs and symptoms of diabetic neuropathy.^{1,3} For example, a small sore that does not get better can become an ulcer—unattended foot ulcers can become gangrenous (where the tissue dies) and require surgery or foot amputation. This can be prevented through early detection and treatment.¹

See a doctor if you have^{1,3}:

- A cut or sore on your foot that is not getting better, infected or worsening
- Burning, tingling, weakness, loss of sensation or pain in your hands or feet
- Loss of balance
- Dizziness
- Changes in digestion (eg, persistent diarrhoea or constipation), urination or sexual function



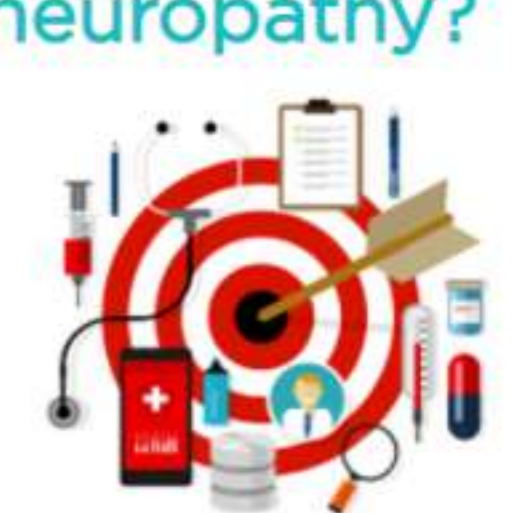
If you have type 2 diabetes, you should also have an assessment for neuropathy when you are first diagnosed with diabetes and annually thereafter.⁴

What can be done to manage diabetic neuropathy?

There is no known cure for diabetic neuropathy. Treatments are available for the management of diabetic neuropathy to^{1,2}:

1. Slow nerve damage^{1,2}

- Keeping blood sugar levels within your **target range** can prevent or delay the progression of the condition. This can also improve some existing symptoms
- Control your blood pressure
- Eat healthily
- Exercise and stay active
- Keep a healthy weight
- Stop smoking
- Avoid alcohol or drink in moderation if you are allowed to drink
- Good foot care is very important

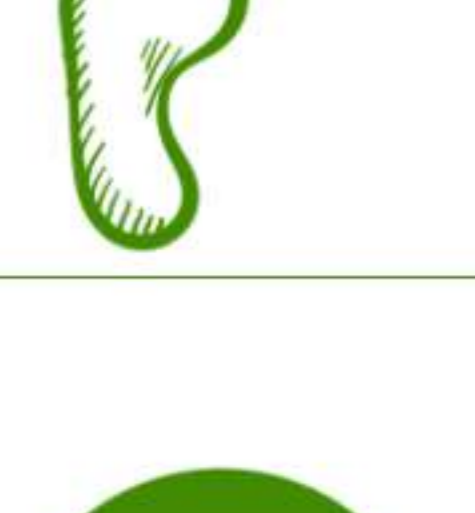


- If you have lost sensation in your feet, protect them from injury and check for cuts, swelling and sores daily**
- Keep your feet clean and dry, and avoid soaking them**
- Wear cushioned, well-fitted shoes**
- Trim your toenails straight and file them to avoid sharp edges**
- Get a comprehensive foot examination performed by your doctor at least once each year**



2. Relieve pain^{1,3}

- Neuropathic pain does not normally respond to common painkillers, eg, paracetamol and ibuprofen
- If necessary, your doctor will prescribe alternative medications to treat nerve pain. These are normally initiated at a low dose, and the dose is increased slowly until you feel better. If you feel side effects such as tiredness and dizziness, your doctor may reduce your dose, or change your medication if they persist. Many of these medications are also used for other conditions such as depression and epilepsy. Hence, your doctor may prescribe an antidepressant for your nerve pain, even if you are not depressed
- Alternative therapies include capsaicin cream, lidocaine plaster, transcutaneous electrical nerve stimulation (TENS) and acupuncture



3. Manage complications and restore function^{1,3}

- These include medications and treatments for nausea, vomiting, erectile dysfunction, bladder control
- Eating smaller, more frequent meals and reducing fat in the diet can help with digestive problems
- If you have low blood pressure on standing, avoid alcohol, drink enough water, and sit or stand slowly

What is diabetic retinopathy?

Diabetic retinopathy causes progressive damage to the retina, and is the most common type of diabetic eye disease.^{5,6} The retina is the light-sensitive layer of tissue at the back of the eye—it needs a continuous supply of blood. If blood sugar levels are constantly high, tiny blood vessels supplying the retina can be damaged.⁷ Diabetic retinopathy normally affects both eyes and if ignored, can lead to blindness.^{6,7}

Am I at risk?

If you have type 1 or type 2 diabetes, you have a risk of developing diabetic retinopathy. The factors below will increase this risk^{5,7}:



- Prolonged diabetes—the longer you have diabetes, the higher the risk
- Poor glucose control
- High blood pressure
- High cholesterol or fats in the blood
- Increased age
- Being pregnant

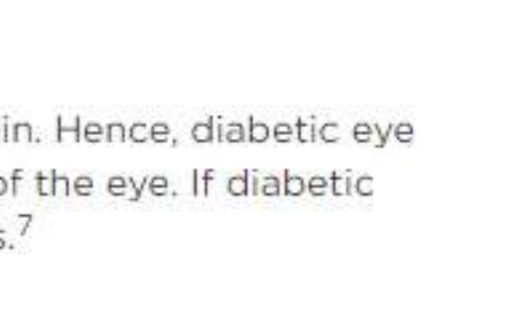
What are the symptoms and complications of diabetic retinopathy?

In the early stages, diabetic retinopathy does not normally have any symptoms or pain. Hence, diabetic eye screening is important, because early signs can be detected by taking photographs of the eye. If diabetic retinopathy is not diagnosed and treated quickly, it can lead to permanent vision loss.⁷

Symptoms usually appear when it is more advanced.⁵

Seek urgent medical attention if you have⁵⁻⁷:

If you have type 1 or type 2 diabetes, you have a risk of developing diabetic retinopathy. The factors below will increase this risk^{5,7}:



- Sudden vision loss
- Slowly worsening/blurred vision
- Eye floaters and spots
- A dark or empty spot in the centre of your vision
- Double vision
- Eye pain or redness
- Difficulty seeing well at night

Assessing retinopathy and reducing the risks

How often do I need to check my eyes?

If you have diabetes, assessment/screening for retinopathy should be conducted at least once a year,^{4,7} and more often if there is damage already present. If you have type 2 diabetes, an assessment should also be performed when you are first diagnosed with diabetes.⁴ If diabetic retinopathy is discovered early, lifestyle changes and/or treatment can prevent it from worsening.⁷

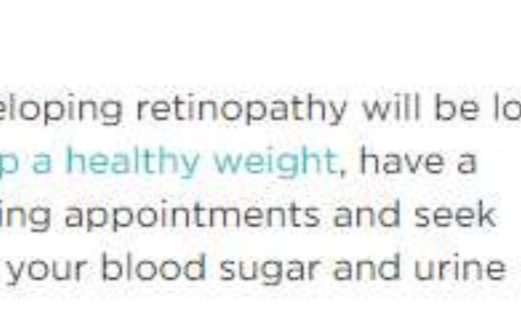


How do I reduce my risk of diabetic retinopathy?

If you control your **sugar levels**, **blood pressure** and **cholesterol**, your chances of developing retinopathy will be lower. **Adhere** to your diabetes medications, and remember about lifestyle factors too—**keep a healthy weight**, have a **healthy diet**, be **physically active** and avoid alcohol and **smoking**. Attend your screening appointments and seek medical attention promptly if there is anything amiss with your vision or eyes.^{6,7} Test your blood sugar and urine ketone levels regularly.⁵

Are there any treatments for diabetic retinopathy?

Treatment depends on the stage of diabetic retinopathy. Early stages may only require regular monitoring. Controlling your blood sugar levels and a healthy lifestyle will slow the onset and progression of the condition. Laser surgery is normally used to treat more advanced disease.⁶ Other treatments include injecting medications into the eyes, or surgically removing blood or scar tissue from the eyes.⁷



What is diabetic nephropathy (kidney disease)?

Anyone can have kidney disease, but it is much more common among those with **diabetes** and **high blood pressure**.⁸ High sugar levels cause the kidneys to filter too much blood and work extra hard. Over time, the kidneys become leaky and proteins are lost in the urine. The overworked kidneys become less and less efficient as a filter, and waste products build up in the blood.^{8,9}



30% type 1
10-40% type 2

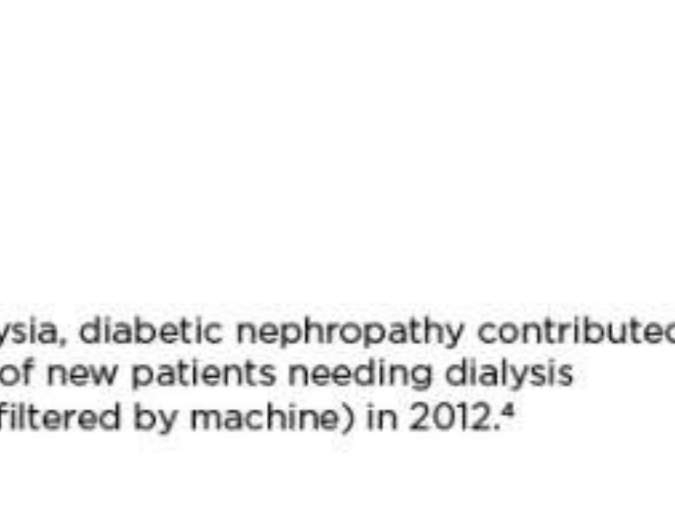
Almost one-third of patients with type 1 diabetes and 10-40% of patients with type 2 diabetes will ultimately suffer from kidney failure.¹⁰



In Malaysia, diabetic nephropathy contributed to 58% of new patients needing dialysis (blood filtered by machine) in 2012.⁴

What are the signs of diabetic kidney disease?

The earliest sign of diabetic kidney disease is increased protein in the urine.¹⁰ You should be screened for the presence of protein in the urine annually.⁹ If you have type 2 diabetes, you should also be screened when you are first diagnosed with diabetes.⁴ Having this test performed is crucial, because tiny protein particles appear in the urine during the initial stages of kidney disease, and the disease can normally be treated at this point.⁸



An annual creatinine blood test will show how well your kidneys are working.⁴

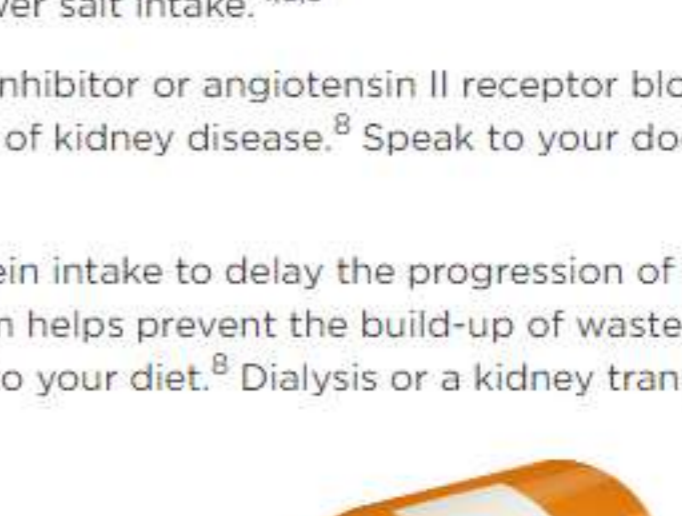
Because your body retains more unnecessary water and salt, kidney disease can also lead to weight gain and ankle swelling. Other early signs include having to go to the toilet more at night, and having an increased blood pressure.¹⁰

What can be done in diabetic kidney disease?

Good **blood sugar** and **blood pressure control** lowers the risk and slows the progression of kidney disease. **Stop smoking**, **stay physically active**, **lose weight**, **eat healthily** and lower salt intake.^{4,6,9}

You may be prescribed with an angiotensin-converting enzyme inhibitor or angiotensin II receptor blocker to blood pressure-lowering medications which also delay the progression of kidney disease.⁸ Speak to your doctor—find out more.

If kidney disease worsens, you may be advised to decrease protein intake to delay the progression of kidney damage.⁴ Limiting foods high in potassium, phosphate or sodium helps prevent the build-up of waste products in the body. However, speak to a dietitian before making changes to your diet.⁸ Dialysis or a kidney transplant is needed if the kidneys fail.⁹



References

- Mayo Clinic. Diabetic neuropathy. Available at <http://www.mayoclinic.org/diseases-conditions/diabetic-neuropathy/basics/definition/con-20033336>. Accessed 19 September, 2019.
- Diabetes UK. Nerves (Neuropathy). Available at https://www.diabetes.org.uk/guide-to-diabetes/complications/nerves_neuropathy/. Accessed 19 September, 2019.
- NHS choices. Peripheral neuropathy. Available at <http://www.nhs.uk/conditions/peripheral-neuropathy/pages/introduction.aspx>. Accessed 19 September, 2019.
- Ministry of Health Malaysia. Clinical practice guidelines: Management of type 2 diabetes mellitus (5th Edition); 2015.
- Diabetes.co.uk. Diabetic retinopathy. Available at <http://www.diabetes.co.uk/diabetes-complications/diabetic-retinopathy.html>. Accessed 19 September, 2019.
- American Optometric Association. Diabetic retinopathy. Available at <http://www.aoa.org/patients-and-public/eye-and-vision-problems/glossary-of-eye-and-vision-conditions/diabetic-retinopathy?ss=0y>. Accessed 19 September, 2019.
- NHS Choices. Diabetic retinopathy. Available at <http://www.nhs.uk/conditions/diabetic-retinopathy/pages/introduction.aspx>. Accessed 19 September, 2019.
- Diabetes UK. Kidneys (Nephropathy). Available at <https://www.diabetes.org.uk/kidneys>. Accessed 19 September, 2019.
- American Diabetes Association. Kidney disease (Nephropathy). Available at <http://www.diabetes.com/living-with-diabetes/complications/kidney-disease-nephropathy.html?loc=1wd-slabmax>. Accessed 19 September, 2019.
- National Kidney Foundation. Diabetes—a major risk factor for kidney disease. Available at <https://www.kidney.org/atoz/content/diabetes>. Accessed 19 September, 2019.