



Macular
Disease
Foundation
AUSTRALIA

**LIVING WITH
DIABETIC EYE DISEASE**

Diabetes and your eyes

Diabetes is a complex, chronic condition characterised by high blood glucose (sugar) levels. Over time, diabetes can affect many parts of the body including your eyes due to changes to blood vessels and blood supply.

Diabetes can affect your eyes in several ways. Diabetic retinopathy (DR) is the most common type of eye disease experienced by people with diabetes. Others include cataract, glaucoma and transient blurring of vision. Everyone with diabetes is at risk of diabetic eye disease.

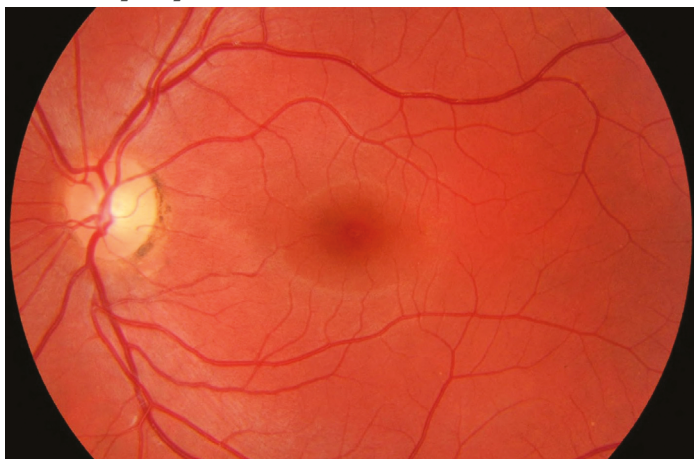
Most vision loss from DR can be prevented, provided it's detected early and steps are taken to keep it under control. Careful control of diabetes can delay the onset or even reverse the progression of DR.

Good diabetes management together with early diagnosis and treatment of eye disease dramatically improves the likelihood of saving sight.

Diabetic retinopathy (DR)

DR is a complication of diabetes caused by damage to the small blood vessels in the retina at the back of the eye. It is the leading cause of avoidable vision loss and blindness in working-age Australians.¹ Up to a third of Australians living with diabetes have some evidence of DR.

Healthy eye



Non-proliferative diabetic retinopathy (NPDR)

NPDR occurs gradually when there is damage to the small blood vessels in the retina due to increased blood glucose levels. In the early stages, vision may not be affected. As NPDR worsens, vision may be affected. NPDR may progress to proliferative diabetic retinopathy.

Proliferative diabetic retinopathy (PDR)

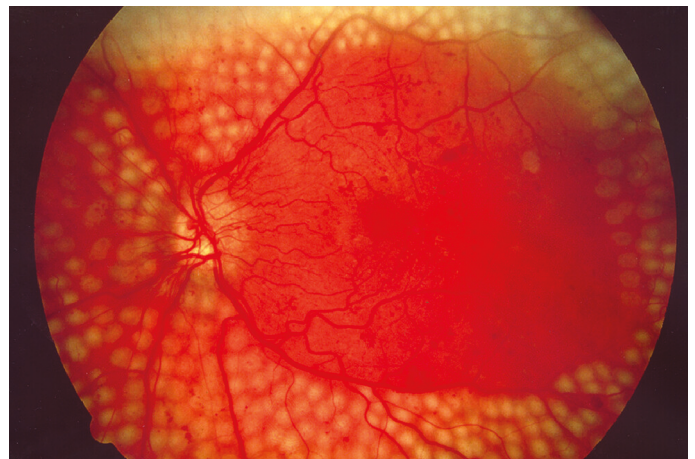
PDR occurs when the reduced oxygen supply to the retina triggers the release of vascular endothelial growth factor (VEGF), which stimulates the growth of new blood vessels (neovascularisation). These new fragile blood vessels tend to leak and bleed, affecting vision. Scarring can also occur and, as the scar contracts, the retina can detach.

Diabetic macular oedema (DMO)

DME can occur at any stage of the disease. It occurs when leaking fluid from retinal blood vessels accumulates in the macula, the area of the retina that is specialised for detailed vision. This can cause the loss of detailed, central vision and even legal blindness.

Most people with diabetes will develop DR over time. However, the severity of disease is greatly influenced by how well your diabetes is controlled.

Eye with diabetic retinopathy treated with laser



Signs of diabetic retinopathy

Signs of DR are only visible during an eye examination by your eye health professional. Some signs of DR include:

- microaneurysms (MA) and haemorrhages, or bleeding from the small retinal vessels. These are typically small spots of blood within the retina. Bleeding into the vitreous, the fluid filled space in front of the retina, can result in blurred vision and the appearance of 'floaters'.
- oedema, or swelling of the retina that occurs as a result of fluid leakage from the blood vessels.
- exudates, or deposits of proteins and lipids (fats) from fluid that has leaked from the blood vessels.
- cotton wool spots, or areas of the nerve fiber layer of the retina that become swollen due to a lack of blood supply.
- neovascularisation, or the growth of new blood vessels on the surface of the retina.



Symptoms

DR can progress to advanced stages before you notice any changes to your vision. Sometimes disease progression can be rapid, leading to sudden vision loss.

The following symptoms could be due to DR, and should always be checked:

- blurred, distorted, or dim vision
- frequent changes in glasses prescription
- sudden onset of haze, shadows or 'floaters' moving across the vision (floaters are dots, circles, lines or cobwebs that move across the field of vision, most noticeable when looking at a white wall or clear sky)
- flashes of light seen repeatedly, often in the peripheral vision.

If you notice any new or worrying symptoms, visit your eye health professional as soon as possible, as early treatment can help to save sight.

Regular eye exams

Along with controlling your diabetes, regular eye exams with your eye health professional are vital to reducing your risk of vision loss.

When you see your eye health professional, it's important to tell them that you have diabetes. Other important information to share includes how long you've lived with diabetes, your most recent HbA1c result (this provides a summary of the average blood sugar level over the past three months), and any medications you're taking.

Once you're diagnosed with DR, you'll need to be checked at least every 12 months, or more frequently as advised by your eye health professional.

Even if you don't notice any symptoms, it's important you attend all your scheduled appointments to detect any problems early. You should also avoid cancelling or delaying eye exam appointments.

Managing risk factors

To slow, halt or in some cases, reverse the progression of DR, it's important to manage your controllable risk factors.

- **Weight and exercise:** Regular exercise helps insulin to work better, lowers blood pressure, and helps reduce weight, which are all important in reducing the risk of DR.
- **High blood pressure:** People with diabetes and high blood pressure are more likely to experience rapid progression of diabetic retinopathy.
- **Blood lipids:** Elevated blood lipids, including cholesterol, may increase your risk of developing DR.
- **Smoking:** Can increase the risk of developing the complications of diabetes, including DR.

Help is available.

Diabetes is a chronic, complex condition, requiring multidisciplinary care. A diabetes care team may include your general practitioner or endocrinologist, diabetes educator, podiatrist, eye health professional (optometrist and/or ophthalmologist), and dietitian.



Diagnosis

An eye health professional will use several tests when diagnosing DED.

Vision or visual acuity testing

Vision or visual acuity testing provides a measure of how well you see. This allows comparison of your vision with previous visits and is important for monitoring changes in vision over time.

Slit lamp retinal examination

Using a microscope-like instrument, your eye health professional will check the health of your eyes, including the retina to check for signs of DR.

You may have your pupils dilated (enlarged) with eye drops, which allows a better view of the retina. The drops normally cause blurry vision and glare for a few hours. It's unwise to drive while your vision is blurry, so arrange how to get home before your appointment.

Supplementary testing

Additional testing may be undertaken, if appropriate, including:

Retinal photography: One or more photographs of the retina are often taken of each eye to provide a detailed record of the level of diabetic retinopathy. This can allow your eye health professional to make comparisons with your previous photographs. The rate of change in retinopathy over time can provide an indication of the risk of the sight-threatening stages. Retinal photography is recommended.

Optical coherence tomography (OCT):

This is a non-invasive imaging technique that uses light to produce very high-resolution cross-sectional images of the layers of your retina. It's particularly helpful to detect diabetic macular oedema, which appears as a collection of fluid within and under the retina.

Angiography: If you have leaking blood vessels or macular oedema, your ophthalmologist may perform a fluorescein angiogram. Fluorescein is an orange dye that is injected into the blood via a vein in your arm. This dye rapidly reaches the eye via the bloodstream and circulates through the retina. A specialised camera, often with a blue-coloured flash, is used to take a series of images of the fluorescent dye as it passes through the blood vessels of the retina. This dye highlights areas of blood vessel leakage, abnormal blood vessels and areas of the retina that are not well supplied with blood. This procedure only takes a few minutes. Some OCT machines can perform a type of angiography (OCT-angiography) that does not require dye injection.



Treatment for diabetic retinopathy

Fenofibrate

The drug Fenofibrate, which is often used to treat high blood lipid levels, has been shown to reduce the risk of DR progression by about 30 per cent for some people with existing NPDR. It appears to provide benefit even for people who have normal lipid levels.² If you're not already taking this drug, and have DR, ask your general practitioner, endocrinologist or ophthalmologist whether this treatment may be suitable for you.

Laser treatment

Laser treatment, known as panretinal photocoagulation (PRP) is the most effective treatment for most people with PDR. The treatment has been shown to halve the risk of severe vision loss in people with PDR. Typically, between 1,000 and 2,000 laser spots are applied to the retina, away from the macula, over several appointments. This reduces oxygen demand of the peripheral parts of the retina. It can also reduce the production of VEGF, which causes blood vessel leakage and abnormal growth. Laser treatment is typically performed in the outpatient clinic by an ophthalmologist. Most people tolerate laser treatment very well, but some may experience discomfort. Drops are needed to dilate the pupils for laser treatment. This can cause some blurring of vision for several hours, so you'll need someone to take you home, as you won't be able to drive.

Intravitreal injections

An intravitreal injection involves the injection of a medication into the eye, usually an anti-inflammatory steroid, or a medication that blocks VEGF (often referred to as an anti-VEGF). These medications are often used to treat diabetic macular oedema and, in many cases, these injections can stabilise or improve vision.

It's important to know that injections usually need to be repeated often, up to each month, for many months, to ensure the best outcomes. Intravitreal anti-VEGFs may be used to treat PDR in some circumstances.

The choice of medication and treatment interval will be determined by your ophthalmologist. Regardless of which medication is used, the following applies:

- An anaesthetic drop and cleaning solution are applied to the eye before the injection. You should experience very little pain, if any, during the procedure.
- It's a quick procedure and usually occurs in your ophthalmologist's rooms, although some patients may be treated in a day-stay unit.
- Treatment usually begins with injections at monthly intervals but may be given less frequently once the swelling is controlled.
- Even if your vision stabilises or improves, you may still need to continue treatment.
- Treatment depends on each person's individual medical circumstances. You are encouraged to discuss your treatment plan with your ophthalmologist.
- You should always follow your treatment schedule, and only stop treatment when advised by your eye health professional.
- Any sudden changes in vision or difficulties experienced after your injection, such as increasing eye redness or persistent pain should be reported to your ophthalmologist immediately. Although rare, infection within the eye can occur and this is an emergency. Urgent review by an ophthalmologist can save sight if an infection occurs.
- You should arrange for someone to take you home, as you won't be able to drive after the procedure.
- If you have any concerns or are having difficulties coping with the treatment, discuss these with your ophthalmologist.

Vitrectomy

A vitrectomy involves the surgical removal of the vitreous (central gel cavity) of the eye. It is performed in an operating theatre by an ophthalmologist either using local or general anaesthesia. It may be required for bleeding into the vitreous (vitreous haemorrhage), for progressive proliferative diabetic retinopathy (PDR) despite laser and injection treatment, or for tractional retinal detachments complicating PDR. Surgery aims to remove the blood and scar tissue from the surface of the retina. Laser is often applied during the treatment. The vitreous is often replaced with fluid or a temporary bubble of gas at the end of the procedure. The gas bubble may take days to weeks to be absorbed and the vision may take some time to clear.

Managing vision loss

Many people who experience vision loss from DR recover well with treatment. Sometimes people with DED can experience regular fluctuations in vision, especially if blood glucose levels aren't well-controlled. This is a result of the lens swelling, resulting in more frequent changes in their spectacle prescription.

Unfortunately, in some instances vision loss may persist despite treatment. If this happens to you, it can take time to adjust. It's not unusual to experience a range of different feelings ranging from acceptance, to disbelief, or even anger or sadness. However, there's a lot of support and advice available to help you overcome this challenge and maintain quality of life and independence.



Low vision plan

Managing vision loss begins with taking control of your situation. It's important to have a plan in order to maintain your quality of life and independence. A good plan will include:

Assessment: A low vision assessment will find the best strategies and support options for individual needs.

Guidance, advice and support:

Low vision services can provide solutions for managing everyday tasks, including aids and technologies, to help you maintain quality of life and independence.



Need more information?



Diabetes Australia

Diabetes Australia is the national body for people affected by all types of diabetes and those at risk. You can find information about living with diabetes, managing your condition, and preventing complications on their website at www.diabetesaustralia.com.au.

KeepSight

KeepSight is a national diabetes eye screening program encouraging people with diabetes to get their eyes checked. By registering with KeepSight, you'll receive important information and alerts. You can sign up for KeepSight at www.keepersight.org.au.

Macular Disease Foundation Australia

Learn more about macular disease at www.mdfoundation.com.au.

How's your macula? Take the quiz at www.CheckMyMacula.com.au.

You can also access our free, personalised support services and order information kits and Amsler grids by calling our National Helpline on **1800 111 709**.

M DFA has a free newsletter and you can sign up to receive invitations to education sessions and events in your area.

Macular Disease Foundation Australia is committed to reducing the incidence and impact of macular disease, by providing up-to-date information, advice and support.

References: 1. Out of sight, 2013, Baker IDI & CERA, 2. Keech A et al, Lancet 2007;370;1687

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