Your eyes and diabetes

Protect your vision now and into the future

CENTRE FOR
Eye Research
Australia

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Hope in sight®

This guide contains general information relating to diabetic eye disease and is intended for informational purposes only. This information is not intended to be used as medical advice and does not guarantee any outcomes. Please do not use this information for diagnosing or self-treating any health or medical-related condition as this information is not a substitute for professional medical advice, diagnosis or treatment. If you think you may have a medical condition or emergency, please immediately consult a medical or health care professional for assistance.

How diabetes affects your eyes

Diabetes causes gradual changes to the eye that can lead to vision loss. Early detection of these changes is the key to saving sight.

Around 1.9 million Australians have diabetes.

One in three Australians with diabetes have diabetic eye disease.

Diabetes occurs when your blood glucose (blood sugar) is too high.

If your blood glucose stays high for a long time, it can damage the small blood vessels in the retina at the back of your eye. This can cause diabetic eye disease ('diabetic retinopathy'). When this happens, you are at risk of vision loss and blindness.

Through careful control of blood glucose, blood pressure and cholesterol levels, and regular eye checks, most vision loss caused by diabetes can be prevented.

Eye problems related to diabetes

Having type 1 or type 2 diabetes increases your risk of developing eye conditions that can affect your vision.

Conditions you should know about

Diabetic retinopathy

This is a common, but serious, diabetes complication. It occurs when the tiny blood vessels in the retina get damaged over time from high blood glucose. This can lead to bleeding and the growth of abnormal new blood vessels, and fibrous tissue.

Diabetic macular oedema

The macula is the central part of the retina that helps you read, drive and recognise faces. Diabetes can cause the blood vessels to leak fluid and make the macula swell. This distorts detailed vision.

Cataract

This is where the lens within the eye becomes cloudy over time. People with diabetes often get cataracts at an earlier age, and they typically get worse more rapidly.

These conditions can cause vision loss and blindness. Regular eye checks are the best way to catch diabetic eye disease early. This is when treatment is most effective.

Warning signs and risk factors

It's important to understand if you're more likely to develop diabetic eye disease.

Know your risk

Anyone with type 1 or type 2 diabetes is at risk of developing diabetic eye disease. But your risk is higher:

The longer you have diabetes

If your blood glucose is above the levels recommended by your doctor for a long time

If you have high blood pressure

If your cholesterol is high

If you have other diabetes complications, such as kidney or nerve problems

If you smoke

If you've recently been diagnosed with diabetes, it's a good idea to get your eyes checked. You may have been living with the disease without symptoms for some time and damage may have already occurred.

Centre for Eye Research Australia

Know the symptoms

Most people with diabetic eye disease are unaware they have it until it is very advanced.

While you may not have any symptoms, there are some things to look out for:

- Blurred, distorted or patchy vision that isn't corrected with prescription glasses
- A smudge in your vision that comes on suddenly. It may look dark or reddish brown and be accompanied by reduced vision
- Objects that appear to float across your vision
- Sensitivity to bright light – may be experienced as glare.

If you notice any changes to your vision, visit your eye care provider as soon as possible. Sudden loss of vision is an emergency.

Monitor each eye

Changes in one eye might go unnoticed as our brain prioritises the better seeing eye. Cover one eye and look at an object to check details are clear and lines are straight. Repeat with the other eye.

Diagnosis and treatment

Most vision loss from diabetic eye disease can be avoided if it's caught and treated early.

Diabetes is Australia's fastest growing chronic condition.

Diabetes eye checks

An eye check is the only way to detect diabetic eye disease. It's usually done by an optometrist or ophthalmologist.

It typically takes under 30 minutes and is often bulk billed. If there are signs of diabetic eye disease, it will either be monitored closely or treated.

A referral from your doctor is usually recommended because:

- ➜ Your doctor can provide information about your diabetes that can help assess risk of vision loss
- ➜ The optometrist is more likely to update your doctor about your eye health so they can provide the best care.

Always tell your optometrist that you have diabetes so they know to check for diabetic eye disease.

Treating diabetic eye disease

Diabetic retinopathy is commonly treated with several rounds of laser therapy to the retina. This can stop the disease getting worse or limit further vision loss. If the disease is advanced, you may need an eye operation.

Eye injections may be needed to treat macular oedema. Vision can often improve, and in many cases, it returns to normal. Repeated treatments are usually needed for the best vision, long term.

Cataracts can be treated effectively with day surgery.

Prevention

You can reduce your risk of diabetic eye disease by looking after your eyes and your overall health.

Focus on lifestyle

Keeping your blood glucose, blood pressure and cholesterol under control makes developing diabetic eye disease less likely.

Quitting smoking can also reduce your risk and make it easier to manage your diabetes.

Diabetes is one of the leading causes of avoidable vision loss and blindness. Regular eye checks can catch changes before they threaten sight.

Get regular eye checks

There are often no symptoms of diabetic eye disease at first. Regular eye checks can catch it early, before any vision loss occurs.

You should get checked when you are diagnosed with diabetes and then at least every two years. More frequent checks are recommended for:

- ➜ Indigenous Australians
- ➜ People with diabetes for 10-15 years or longer
- ➜ Women who are pregnant or planning a pregnancy
- ➜ People who have complications from diabetes, like kidney problems.

Sign up for free reminders

There's a lot to stay on top of with diabetes. Through the KeepSight program, run by Diabetes Australia, you can receive a reminder when your next eye check is due.

You can register at **keepsight.org.au** (it only takes a minute) or ask your eye care provider to sign you up.

Research Spotlight 1

Advancing eye screening

CERA researchers have discovered a new way to predict risk of vision loss from diabetic retinopathy.

It's important to know which patients are likely to progress to the advanced stages of diabetic eye disease that cause vision loss. These people can be monitored more closely and treated at the right time.

There are already tools, like eye cameras, to help eye care providers see the small blood vessels in the retina. This can help them work out who may be at higher risk of vision loss. While the existing tests are effective, CERA researchers might have found a better way.

Associate Professor Peter van Wijngaarden and his team have been trialling a new type of retinal photography called hyperspectral imaging. They've found that this technology can detect earlier signs of damage to blood vessels in the retina. This could help them better predict risk of progressing to the sight-threatening stages of diabetic retinopathy.

The new technology could lead to more personalised eye care.

The team is using a new type of camera they developed to measure blood supply in the retina. Their approach is similar to how oxygen levels are measured with a finger-tip probe ('pulse-oximeter'). But instead, they use a non-contact method – a specialised eye photograph.

This development may allow eye care providers to personalise care based on a patient's unique risk profile.

The research team is now validating this promising technology through a larger study. If successful, the new retinal camera could become part of routine screening for diabetic retinopathy within five to seven years.

Research Spotlight 2

Protecting the vision of pregnant women

CERA research sheds new light on diabetic retinopathy in pregnancy.

Pregnant women living with diabetes are at increased risk of diabetic retinopathy because blood pressure and blood glucose levels are harder to control during pregnancy.

Until recently, we didn't have any current data on the number of Australian women living with diabetes who develop diabetic eye disease in pregnancy. There was also no Australian research on expectant mothers with type 2 diabetes – a growing population.

Risk factors for diabetic retinopathy are even harder to control during pregnancy.

Thanks to a 2022 study by Associate Professor Lyndell Lim we now know much more about diabetic retinopathy in pregnancy.

The study found that about one in four pregnant women with diabetes had diabetic retinopathy. Nearly one in nine had a sight-threatening form of the disease, which persisted for a year postpartum.

Women with type 2 diabetes also developed diabetic retinopathy. And the disease progressed in some of them.

More than one in 10 women were unable to come in for an eye check as part of the study due to the competing demands of managing their pregnancy, diabetes and other commitments.

These findings show that there are barriers to screening for diabetic retinopathy during pregnancy. It also underscores the need to promote eye checks for all pregnant women with diabetes, regardless of whether they have type 1 or type 2.

Associate Professor Lim and her team are continuing to advance knowledge in this area with the hope that new mothers will not have to face losing their sight from diabetic retinopathy in the future.

Research Spotlight 3

Better treatment on the horizon

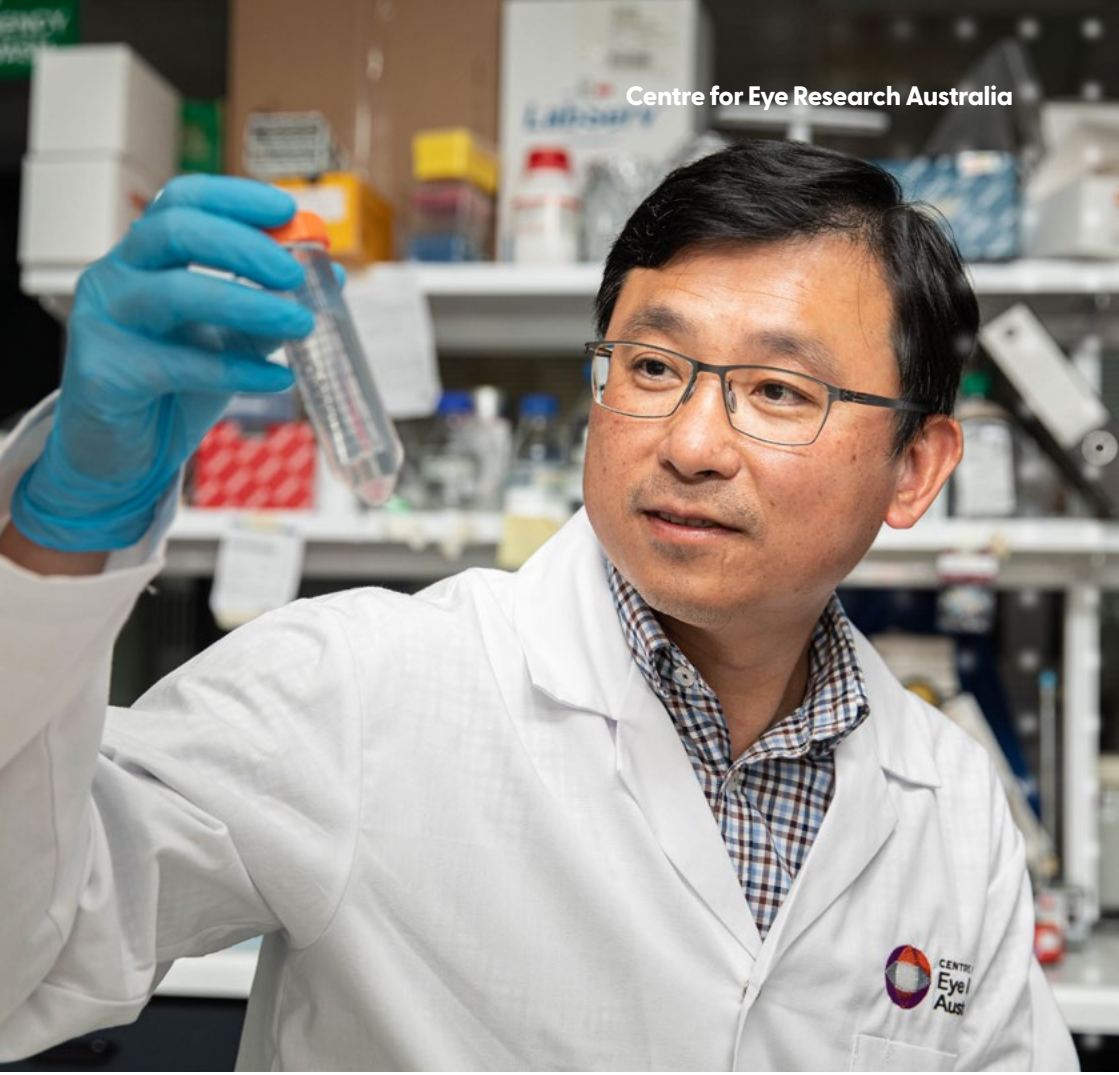
CERA is investigating a new gene therapy that could remove the need for frequent eye injections to treat diabetic retinopathy.

People with diabetic retinopathy have leaky blood vessels in their retina. This leakage can lead to swelling of the retina, known as macular oedema, and vision loss if left untreated.

Research could help tailor therapies to eye conditions.

Macular oedema is commonly treated with regular injections into the eye. However, these injections are invasive, as well as expensive to both patients and the healthcare system.

Associate Professor Guei-Sheung (Rick) Liu is hoping to ease the burden of frequent eye injections. He's investigating new gene therapies that would stop the leaking from blood vessels in the retina and be delivered as a long-lasting injection, or via an eye drop.



Unlike the current eye injections, which wear off within weeks, gene therapy could provide a long-term solution. Importantly, an innovation developed by Associate Professor Liu's team would allow the treatment to be switched on and off in the eye on demand with a simple eye drop. This would enable precise control of the treatment according to an individual patient's needs.

Associate Professor Liu hopes to see this promising technology move to the clinical stage in the next five to 10 years.

Research Spotlight 4

Working together to end avoidable vision loss

CERA is the research partner of the national eye screening program KeepSight.

Only half of Australians with known diabetes get their eyes checked regularly enough. This increases their risk of vision loss from diabetic eye disease.

KeepSight is a national program that is working to change this by sending eye check reminders to people with diabetes. It's run by Diabetes Australia and funded by the Commonwealth Government and private sector partners.

CERA's Associate Professor Peter van Wijngaarden is one of KeepSight's founders and he's been involved since it launched in 2019. The program has a range of partners, including CERA as the program evaluation lead.

In just four years, KeepSight has achieved impressive outcomes:

- ➜ More than 300,000 people have registered with the program
- ➜ Over 135,000 reminder messages have been sent
- ➜ There have been more than half a million KeepSight visits to optometrists Australia-wide.

This is tremendous progress, but more work is needed to get all 1.5 million Australians with diagnosed diabetes part of the program.

The KeepSight team and CERA researchers are now piloting evidence-based, tailored health messages and trialling programs to engage culturally and linguistically diverse communities in diabetes eye care. Aboriginal and Torres Strait Islander people are a particular focus of these initiatives.

By making participation in eye screening easier for people with diabetes, KeepSight is working to reduce avoidable vision loss.

You can register at keepsight.org.au or ask your eye care provider to sign you up.

Be part of the future of eye research

To advance our understanding of diabetic eye disease and find better treatments, clinical research is essential.

CERA conducts clinical studies for a variety of eye conditions, including diabetic eye disease. By taking part in clinical research, you can play an important role in the future of eye health for people with diabetes.

To find out more about clinical trials at CERA and register your interest online, visit cera.org.au

About CERA

Our goal is to prevent vision loss – and, ultimately, find cures to restore sight.

The Centre for Eye Research Australia (CERA) is an international leader in eye research. We use our world-class knowledge and expertise to achieve better treatments and faster diagnosis of eye disease.

We are an independent medical research institute closely affiliated with the University of Melbourne and co-located with the discipline of Ophthalmology in the Department of Surgery, Melbourne Medical School at the Royal Victorian Eye and Ear Hospital.

Our aim is to offer hope to people affected by vision loss and protect the sight of everyone in need.

With CERA, there's hope in sight.

Donate to support life-changing research

CERA researchers sincerely appreciate the generosity of our community of supporters. Your donation, no matter how big or small, will help us continue our sight saving research.

If you wish to make a donation or learn more about our research, please visit cera.org.au or call us on 1300 737 757.

Acknowledgments

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For more information about how you can help find new treatments and cures for eye disease and support research at CERA.

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