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Diabetes and Your Eyes

A consumer guide for the management of diabetic retinopathy

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NHMRC
National Health and Medical Research Council

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The strategic intent of the NHMRC is to work with others for the health of all Australians, by promoting informed debate on ethics and policy, providing knowledge based advice, fostering a high quality and internationally recognised research base, and applying research rigour to health issues.

The production and distribution of these guidelines were funded under the National Diabetes Strategy.

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National Health and Medical Research Council documents are prepared by panels of experts drawn from appropriate Australian academic, professional, community and government organisations. NHMRC is grateful to these people for the excellent work they do on its behalf. This work is usually performed on an honorary basis and in addition to their usual work commitments.

About this guide

This book provides information to people with diabetes and their family members about the need for screening and the risk of diabetic retinopathy for people with diabetes. It explains what is currently known about the causes, risk factors, and benefits from eye screening. The book also outlines current recommendations for laser and other treatments, their benefits and side effects, and the need for follow-up after treatment.

Diabetes and Your Eyes: A consumer guide for the management of diabetic retinopathy was written by the National Health and Medical Research Council (NHMRC) through its Standing Committee on Quality of Care and Health Outcomes (QCHOC).

The NHMRC is an independent body which advises the Australian public and Federal and State Governments on standards of individual and public health, and which supports research to improve those standards.

Diabetes and Your Eyes is part of the NHMRC national program to improve the quality of health care and outcomes, through the development of guidelines for doctors and other health professionals, which are based on evidence.

The NHMRC chose diabetic retinopathy as a topic for this national program because of its importance as a cause of blindness in young and middle aged Australians. Many people with diabetes suffer visual loss because they are seen too late for effective treatment. This vision loss is preventable with treatment.

QCHOC established a working party comprising representatives from ophthalmology, optometry, endocrinology, epidemiology, general practice, nursing, as well as a representative of Aboriginal

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and Torres Strait Islander peoples, and consumer representatives. Appendix A provides the names of these members and the terms of reference of the working party.

The NHMRC has written a larger book, *Clinical Practice Guidelines for the Management of Diabetic Retinopathy*, which has been distributed to people involved in the management of diabetic retinopathy. *Diabetes and Your Eyes* is a smaller version of that larger book, written for consumers.

It has also produced a *Quick Reference Guide for Optometrists, Nurses and Other Health Practitioners* and a *Guide for General Practitioners.* Each of these NHMRC books are based on all the current available evidence for the best management of diabetic retinopathy, at the time of publication. Where the evidence is particularly strong, this has been highlighted.

Should you wish to obtain further copies of *Diabetes and your eyes: a consumer guide for the management of diabetic retinopathy*, they can be obtained by contacting:

The Secretariat
National Diabetes Strategy
Diabetes Australia
AVA House
5/7 Phipps Place
DEAKIN ACT 2600

Phone: (02) 6285 3277
Fax: (02) 6285 2881

Additional copies of this guide are available from the National and State/Territory offices of Diabetes Australia.

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Introduction

Diabetes and Your Eyes: A consumer guide for the management of diabetic retinopathy is for people who have diabetes and their families. Its purpose is to help people to become involved in making decisions about their treatment by giving them information regarding regular eye checks and treatment of diabetes related eye disease.

After 10 or 15 years, most people with diabetes have signs of mild damage to the back of the eye that we call retinopathy. However this has no effect on vision. Retinopathy only affects your sight if it becomes significant or advanced.

Not everyone with early retinopathy will go on to develop advanced retinopathy, but because everyone with diabetes is at risk, it makes good sense to have regular eye checks (at least every two years). In this way, retinopathy can usually be picked up before serious damage to your sight has occurred.

Once advanced retinopathy is detected, there is very strong evidence that laser treatment can prevent any further loss of vision.

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Summary of Key Points

- Everyone with diabetes is at risk of retinopathy.
- The longer you have diabetes, the greater the risk.
- Good control of your diabetes will help prevent retinopathy.
- Once your sight has been affected by retinopathy, treatment mostly cannot improve it, but can usually stop it getting worse.
- Regular eye checks (at least every 2 years) can pick up early signs of retinopathy.
- Once detected, laser treatment can mostly prevent sight loss and blindness from significant or advanced retinopathy.
- In addition to regular eye checks, you should see your doctor without delay if your vision worsens.

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Part One Diabetes and the eye

The eye

Before looking at diabetic retinopathy it is important to understand what the healthy eye looks like and how it works.

The eyes sit inside sockets in the skull, protected by the eyelids. At the front of the eye (the visible part) is the black pupil. The pupil is surrounded by the iris, the coloured part. Directly behind the pupil and not visible to the naked eye, is the lens which is the shape of a small magnifying glass.

Inside the eye there is a transparent jelly-like substance called the vitreous. This is surrounded by a thin layer called the retina, which lines the inner wall of the eye. The retina is attached to the wall of the eye.

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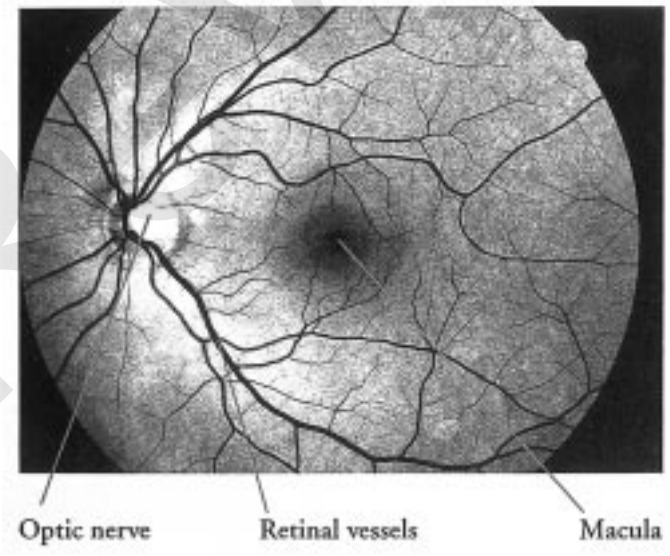
A normal eye.

The eye works a bit like a camera. The light passes through the pupil and is focused on the retina (much like film). The light is picked up by special cells and information received (the picture of the outside world) is passed along the optic nerve which goes from the back of the eye to the brain, where the picture is interpreted.

At the very centre of the retina is the macula. This is the most important part of the eye, the part which ‘sees’ what is at the centre of your vision. The rest of the retina is responsible for the areas you see less clearly, at the edges of your vision, or out of the corner of your eye.

The photograph below shows the appearance of a normal retina, similar to the view that can be seen with a hand-held light called an ophthalmoscope.

In the photo, the macula is clearly visible and is surrounded by blood vessels.



Looking inside the eye — a photograph of a normal retina.

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What is retinopathy?

Diabetic retinopathy simply means disease of the retina. It occurs when diabetes damages the very fine blood vessels in the retina.

There are two different stages:

- early retinopathy (background or non-proliferative retinopathy)
- advanced retinopathy (proliferative retinopathy or macular oedema)

Early retinopathy is very typical of diabetes. Signs of early retinopathy include tiny bleeding or leaking spots in the retina (haemorrhages or microaneurysms) and some fatty deposits (exudates) that have escaped from small blood vessels (capillaries). This stage of retinopathy usually does not need treatment as long as the macula is not involved, but needs to be watched closely.

Advanced retinopathy includes macular oedema and proliferative retinopathy.

- Swelling or thickening of the macula *(macular oedema)* is the commonest reason for retinopathy affecting sight. If this isn't treated, the centre of vision is permanently damaged, which will affect your ability to read. Laser treatment is recommended and can mostly stabilise macular oedema.
- *Proliferative retinopathy* occurs when small blood vessels in the retina become blocked from diabetes and new blood vessels then grow in response. These new vessels are fragile. They bleed easily and without warning into the vitreous so that dark red streaks are noticed. This can cause a sudden loss of vision which can take days, weeks or months to clear, depending on the size of the bleed.

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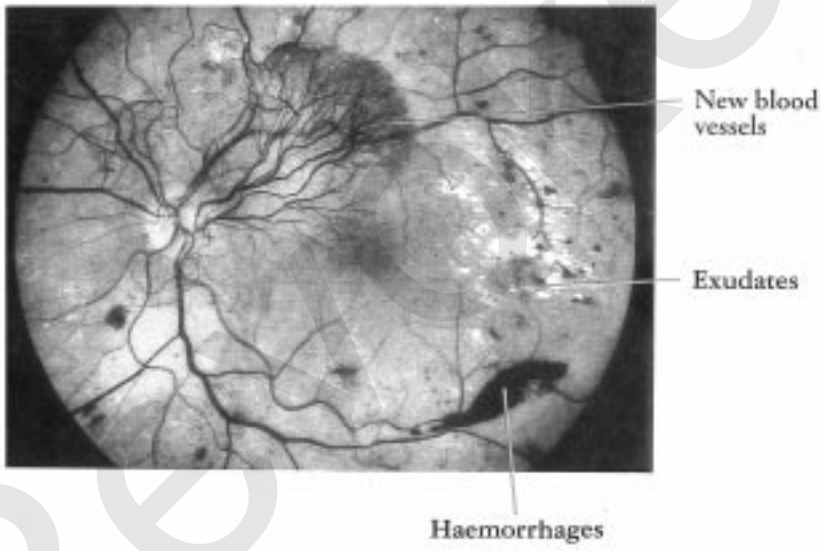
- If you have a number of these bleeds scar tissue may form between the retina and the vitreous. This scar tissue may then contract and pull the retina away from the outer wall of the eye. This is called *detached retina* and needs urgent treatment. When the retina is affected in this way, people may notice a sudden loss of vision or dark shadow.
- Sometimes, the pressure within the eye increases because of diabetes and *glaucoma* occurs. In the older age group there is also a two fold increased risk of glaucoma compared to people without diabetes.



Photograph of a retina showing proliferative retinopathy.

How common is retinopathy?

Everyone with diabetes is at risk.

- After 15 years, about three out of four people with diabetes have some retinopathy. In the majority of people it is early with no immediate risk of sight loss.

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- About one in four get proliferative retinopathy or macular oedema, or both, after 15 years.
- If you have diabetes, there is a one in three chance that the condition has already caused some changes in your eyes, and about one chance in ten that your sight is at risk of serious damage.

People of Aboriginal and Torres Strait Island descent have ten times the risk of developing diabetes and may get retinopathy at an earlier age. It is particularly important that they follow the guidelines.

Who is at risk?

People most at risk are those:

- who have had diabetes for many years;
- whose diabetes is poorly controlled (high blood sugars);
- with insulin dependent diabetes (IDDM) who face a slightly higher risk of developing retinopathy;
- with diabetic kidney damage; and
- with high blood pressure, high blood fats (cholesterol) and pregnancy which can make diabetic retinopathy progress faster than usual.

But everybody who has ever been diagnosed with diabetes are at risk, even a person whose diabetes is controlled with diet alone.

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Risk factors: a summary

- The longer you have diabetes, the greater the risk of diabetic retinopathy.
- Poor blood sugar control markedly increases your risk.
- High blood fats (cholesterol), high blood pressure, diabetic kidney disease and pregnancy may also increase the risk.
- The most important risk factor you can change is blood sugar control. You can also reduce blood pressure and blood fats by diet, exercise or tablets.

Diabetes and cataracts

The lens of your eye is normally quite clear. A cataract means that the lens is gradually becoming cloudy, and this makes your sight gradually less clear. It also scatters light, leading to a sensation of glare. Cataracts are common among older people but in people with diabetes they can develop at a younger age and a bit more quickly.

Cataracts can generally be treated successfully. An eye surgeon removes the cloudy lens and replaces it with a new, artificial lens made of plastic. The operation is usually done under local anaesthetic and has a high success rate. In people with diabetes the result may not be as good, because existing diabetic retinopathy may worsen after surgery.

It is important that you are examined before the cataract is too advanced as laser treatment is often needed before the operation. Sometimes the cataract operation needs to be delayed until the laser can be done and the eye is stabilised. There is evidence that

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after cataract surgery people with diabetes may not see as well as those without diabetes. The final vision may not be as good as in otherwise healthy people. As with any operation, the decision about cataract surgery is taken when the likely benefit outweighs the small risk and when a significant improvement in vision seems likely.

Some people with diabetes will need special laser treatment about a year after the operation to clear a membrane that can thicken.

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Part Two Looking after your eyes

Fortunately you can do something to prevent loss of sight from diabetes.

- By achieving good control of your diabetes, your blood cholesterol and your blood pressure.
- By having your eyes checked regularly, signs of eye disease can be picked up early.
- Laser treatment can then be used to prevent retinopathy damaging your sight.

Have your eyes checked regularly

It is very important to have your eyes examined regularly by someone trained to detect retinopathy. A great deal can be done to limit the eye damage if it is detected early.

Don't wait until you notice problems

Retinopathy can be quite advanced before you notice anything wrong with your sight. The earlier treatment starts, the better the chance of preserving your sight.

Are there any exceptions?

No. Every person with diabetes should have their eyes checked as soon as diabetes is diagnosed and at least every two years after that.

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You need to be examined earlier if your sight worsens between these tests. Once any signs of retinopathy are found you need to be seen more regularly, at least every 12 months and often more frequently.

For children with diabetes the first examination may not be needed until puberty, although earlier examinations may be appropriate for some children.

If you have not already had your eyes checked for retinopathy, including a vision check, ask your doctor to arrange it soon.

What's involved?

The vision (acuity) of each of your eyes will be checked on a chart.

To get a good view of the retina, your pupils will need to be dilated with special eye drops. These are quite safe, and the effect wears off within an hour or so. Most people can drive safely after the test, but wearing sunglasses can help with the glare.

The examination of the back of the eye (retina) is usually conducted with a hand held instrument about the size of a torch. Each eye will be looked at separately.

Sometimes, photos of the retina may be taken using a special camera called the non-mydriatic retinal camera. For these photos, eye drops may not be needed. The photos are then examined by someone trained to diagnose retinopathy. If the photos are not clear enough, you may need to have a second set taken or see an eye specialist.

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Who can test your eyes?

Anyone who has been appropriately trained to detect retinopathy can do the tests. This may be an eye specialist (ophthalmologist), optometrist, nurse, diabetes specialist or your general practitioner.

Should you see an eye specialist?

If retinopathy is picked up, you should be referred to an eye specialist:

- for mild signs of retinopathy, a referral should be arranged soon; and
- if it is more advanced, referral should be arranged as soon as possible, or urgently, depending on the signs.

How often?

Once any retinopathy is found, you need to be examined at least every 12 months, or more frequently if the retinopathy is more advanced.

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Part Three Treatment

Laser therapy

Advanced diabetic retinopathy is treated with laser. A laser is simply a very narrow concentrated beam of light which can be used to treat areas damaged by diabetes.

What's involved?

Laser treatment may be carried out over several sessions and can be done in your doctor's surgery or as an outpatient in a hospital. It usually takes about 15 minutes for each session.

First you will have eye drops in the eye to be treated. This is to enlarge the pupil so that the doctor can obtain a good view of your retina. Then an anaesthetic drop will be put in your eye. This enables the doctor to use a special contact lens over the pupil, which helps focus the laser beam on the retina. The contact lens is removed after treatment.

During your treatment, you will sit at a machine similar to the one the eye doctor normally uses to examine your eyes. Your head will need to be still for the treatment and may be held.

Small treatments are not usually very painful but larger treatments can sometimes cause pain. If you find the treatment painful, you may be given a small injection of local anaesthetic through the eyelid below the eye to stop the pain.

You may or may not need time off work to complete the laser treatment. Driving your car may also be more difficult during the period the laser is being given and afterwards, particularly at night. Your sight may be worse for a few days or weeks after the laser, but it usually recovers fairly well.

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How well does the laser work?

Laser treatment is not a cure-all, but strong and consistent evidence from large trials has shown that it is very effective. In these trials, laser treatment prevented loss of sight in the majority of people but not in everyone.

Best results occurred in people who were seen before their sight was badly affected or before the condition was too advanced. Once your sight is damaged, laser treatment usually cannot bring it back. This is why regular checks are recommended even before you notice any change in vision.

Treating macular oedema

For macular oedema, a fluorescein dye test is usually needed beforehand. This shows the 'leaky' areas needing treatment. Photos of the retina are used to guide the doctor when applying laser treatment.

Macular oedema is usually treated in one session, but sometimes this may need to be repeated if the swelling does not settle properly.

Treating proliferative retinopathy

The problem with proliferative retinopathy is the new blood vessels which grow. These can bleed easily and cause scarring.

Laser is applied over large areas of the outer retina. This causes the new blood vessels to disappear. Treatment is usually spread out over a few months, as each eye takes several sessions to treat properly.

Treatment is only given if you have new blood vessels forming because of the slight risk of damage to your sight, particularly night vision and close vision for reading. For example, you might

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find after laser treatment that on the eye test chart, you can no longer read one or two lines that you could previously read before the laser treatment. Your vision at night and what you can see out of the corner of your eye may be reduced. This can also be caused by the diabetic retinopathy itself.

> However, if you have proliferative retinopathy and you do not have laser treatment, you may lose your sight completely.

Combined treatment

If you have both proliferative retinopathy and macular oedema, your doctor will usually treat the macular oedema first. Once this settles down, the larger laser treatment can be done.

Side effects

With any medical treatment, as well as benefits, there are side effects which your doctor should discuss with you, so you can make an informed decision.

Mostly these side effects should not stop someone with advanced retinopathy having laser treatment. You should discuss the benefits and risks with your doctor so that you are satisfied you have a clear understanding before you proceed. If you are worried, your doctor will be happy for you to get another opinion.

The most frequently experienced side effects are listed below. In most cases these are mild, and you won't necessarily experience all of them.

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Pain

Some people find that large laser sessions can be painful, particularly towards the end of the treatment. However, most people can cope with the discomfort as the session only lasts about 15 minutes.

The pain settles fairly quickly once laser treatment is completed. If the discomfort during laser treatment is too great, then future sessions can be given after a local anaesthetic injection.

Blurring of vision

Often your vision is blurred in the period immediately after laser treatment. This typically lasts for a few hours or days, though in some cases, may last for some weeks. Large laser sessions can sometimes cause a short-sighted change in vision that can last for weeks, but which eventually recovers.

A worsening or loss of sharpness in vision in the months after laser treatment can persist in some people. This may happen because the retinopathy has such momentum it continues to progress for a while even though laser treatment is under way.

Bleeding from diabetic new vessels may be another cause of blurred vision. It is not caused by the laser, but can occur at any time, until the vessels go away in response to the laser treatment. This is another reason to detect retinopathy early, so laser treatment can be started before your vision is affected and retinopathy is too advanced.

Increased glare sensitivity

This may happen because of the retinopathy itself, or be caused by the laser. It tends to improve and be less noticeable a few months after the laser treatment is completed. Wearing sunglasses generally helps.

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Loss of side vision

A form of tunnel vision can result if large areas of the retina need to be treated. Although this can be picked up by testing the visual field, most people are not aware of it. For most people, laser treatment does not cause enough loss of visual field to prevent safe driving.

Is a fluorescein dye test needed?

This test involves an injection of fluorescein, a yellow dye into a vein in the arm or hand. The dye test is mostly indicated for laser treatment of macular oedema and may be needed in follow-up visits.

For proliferative retinopathy, the dye test sometimes helps identify sources of bleeding, but may not be necessary in all cases.

A dye test is never needed to screen people for retinopathy or when retinopathy is detected very early.

The most common side effect of the dye test is nausea. It occurs in about one in three people but usually only lasts for a few seconds. Occasionally a mild allergic reaction or more serious side effects occur, but these can be treated. It is normal for your urine to turn yellow for a day or so after the test.

What follow-up is needed after laser treatment?

Close and regular follow-up after laser treatment is very important, as many people need further treatment if retinopathy fails to respond or if it recurs.

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When is vitrectomy surgery needed?

If proliferative retinopathy causes a large bleed that does not clear, then after some months an operation could be considered. The operation is termed vitrectomy as it removes the vitreous of the eye together with blood and scar tissue.

In a large trial this operation was found to be of benefit. For less severe bleeding and in older people, the benefits are much less. So in this case it would be better to wait and see if the condition resolves itself.

The operation may also be used if new blood vessels cause scarring to pull on the retina (detached retina). Laser treatment is usually needed before the operation to achieve the best results.

What about side effects?

Further bleeding or cataract formation are the commonest side effects of vitrectomy. Eyes can go blind after the operation because of glaucoma or scarring.

Treatment Summary

Really good control of blood sugar makes a big difference to the health of your eyes.

Laser treatment is very effective but only when you treat the condition early.

Your sight mostly can't be restored once it is lost.

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Part Four Living with Diabetes

Diabetes is a condition which affects the body's ability to use and store sugar (glucose). In Australia about 350,000 people are known to have diabetes, and there are probably up to another 300,000 who have not yet been diagnosed.

Diabetes can damage your eyes, and if left unchecked and untreated can eventually lead to blindness. In fact, it is the cause of 10% of blindness in Australia, and is the most common cause of blindness in people under 65.

There are two types of diabetes

Insulin dependent diabetes mellitus (Type 1) affects one in ten people with known diabetes and usually occurs in young people before age 30. It is caused by too little insulin being produced by the pancreas and is treated with insulin injections. These days, it is common to use several injections of short-acting insulin before meals.

Non insulin dependent diabetes mellitus (Type 2) is the most common (nine in ten people with diabetes) and usually occurs in people over the age of 30. The body continues to produce insulin, but the insulin can't be used effectively. 6% of Australians over 50 years of age have had diabetes diagnosed and many more don't know they have it. Many people with non insulin dependent diabetes need tablets to increase the release of insulin. After some time, about one in four will need insulin injections.

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Symptoms of Diabetes

Symptoms from diabetes are caused by the high level of blood sugars and can include:

- increased thirst and urination;
- tiredness and lack of energy;
- weight loss or weight gain;
- skin or vaginal infections; and
- blurred vision.

These symptoms may occur suddenly or develop slowly over months or years. However, many people may not have any symptoms.

Helping yourself

The aim of diabetes treatment is to keep your blood sugar under control. The key is to adopt a healthy lifestyle, including:

- a balanced diet high in fibre and low in fat and sweet foods;
- regular exercise;
- stopping smoking; and
- reducing alcohol intake.

Self monitoring your blood sugar is the best way to know what the body is doing and to balance the effects of food and exercise. It is not complicated and can be fitted into your usual activities as part of a regular routine.

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Why tight sugar control helps

Keeping your blood sugar under control helps you feel well. It also decreases the risk of long-term damage to the eyes, kidneys and nerves.

Other health problems affecting your cardiovascular health such as high blood pressure, high cholesterol, being overweight and smoking, all contribute to this long-term damage. In particular, they increase the risk of blockages occurring in the heart, brain, legs and elsewhere.

This is why people with diabetes have a greater risk of heart attack, stroke and circulation problems in the lower legs, leading to risk of gangrene and amputation.

Why you need to be in control

Because there are so many health problems that can arise with diabetes, the best person to put in charge of your treatment is **you**. You are the only one who has the whole picture, so you are in the best position to keep your diabetes team informed. Remember to advise and seek help from your GP or diabetes nurse, diabetes specialist, dietitian, pharmacist, podiatrist, optometrist or eye specialist as problems arise.

Diabetes Australia can also help. There are Associations in every State and Territory. See Appendix C for other helpful agencies.

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Part 5 Questions

My diabetes is very mild, only needing diet control. Do I still need to have my eyes checked regularly?

Yes, you do. The risk is only slightly reduced in people with diabetes controlled by diet alone. Your diabetes may also have been present for longer than you realise, and this could increase your chances of developing retinopathy.

Can I still develop retinopathy if my diabetic control is very good?

Yes, but by maintaining good blood sugar control you reduce your risk considerably. However, other factors contribute, such as blood pressure and cholesterol, and as well there are likely to be some factors we don't yet know about.

Is there any point putting a big effort into diabetic control if I already have retinopathy?

Yes, there is. There is strong evidence that progression can be slowed by 50%. However, it is not known whether there is any benefit for very advanced retinopathy. It seems likely that good control may also slow progression of other diabetic effects, like kidney damage, which usually do not develop until after retinopathy.

I notice that my vision fluctuates a lot. Does this mean I am developing eye damage?

Yes, it can. These changes can be due to retinopathy. However, they can also result from changes to the sugar content of the lens in the eye, due to fluctuating blood sugar, particularly if there is a sudden change. Such lens changes may not cause any permanent damage.

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I am worried that my eye will move during the treatment.

With care and attention, most people can keep still enough during the laser for it to be given safely.

I am worried about the pain from the laser.

Treatment of macular oedema is not uncomfortable for most people. However, treatment for proliferative retinopathy can be quite painful for a few minutes. Some people are not bothered at all by the laser, while others find it quite unpleasant. Your eye doctor will start slowly to see how you cope.

If pain from the laser is difficult to cope with, treatment can be spread over a few sessions or these can be shortened. If you still feel too much discomfort, your doctor can give a numbing injection through the lower eyelid to areas around your eye. This will stop all pain during the treatment, though some pain may return in two or three hours after the injection wears off.

I have heard that the laser can blind you.

In many people retinopathy is detected too late, after a bleed or with advanced macular oedema. Retinopathy may then continue to progress until vision eventually fails. In some advanced cases, retinal detachment may still develop, despite laser treatment. This illustrates the need to detect retinopathy before it is too advanced. Laser is extremely effective in most patients treated, but benefits may not occur for some months after it is finished. Vision may improve for a long time as the retinopathy stabilises.

Very rarely, the centre of vision can be treated accidentally by the laser and sight can be damaged. For this reason, laser should not be considered until there is a definite risk to vision.

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After laser is finished, will I need it to be repeated each year or so?

It depends whether the laser treatment is for macular oedema or proliferative retinopathy. For macular oedema, laser treatment sometimes needs repeating if the disease stays active. For proliferative retinopathy, the laser treatment may extend over some months or even up to a year before all the necessary areas have been treated, after periods of follow-up. Once the new blood vessels shrivel, and adequate laser treatment has been done, further laser is rarely needed. The benefits of laser treatment appear to be lifelong.

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Appendix A Working party terms of reference and Membership

Terms of Reference

To undertake the development of clinical practice guidelines for the management of diabetic retinopathy with particular emphasis on the:

- identification and modification of risk factors for diabetic retinopathy
- timing and frequency of eye examinations as part of early detection programs
- conduct of eye examinations including the efficiency and effectiveness of various techniques such as non-mydriatic and mydriatic colour fundus photography, and pupil dilatation
- role of fluorescein angiography in management of diabetic retinopathy
- timing, patterns of treatment and follow-up of optimal laser treatment
- relationship between cataract surgery and diabetic retinopathy
- cost-benefit analysis of screening and treatment of diabetic eye disease using models developed in the United States and adapted to Australian conditions

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- following procedures recommended by the Quality of Care and Health Outcomes Committee (QCHOC) using the NHMRC *Guidelines for the Development and Implementation of Clinical Practice Guidelines.*

The development process specifically aimed to:

- Examine and identify questions to be addressed by the guidelines and target groups for the guidelines;
- Assess any existing guidelines;
- Review and evaluate the extent and strength of scientific evidence relating to the effectiveness and appropriateness of relevant interventions;
- Identify cost issues involved in the management of diabetic retinopathy, short and long term health outcomes and measures, recommendations for best practice and areas for future research;
- Write evidence-based guideline documents for the identified target groups;
- As a minimum it was expected that two documents would be written; one aimed at clinicians and one aimed at consumers.
- Undertake wider consultation;
- Report on the guideline development process, including; a strategy for dissemination and implementation and a short and long term plan for evaluating and updating the guideline documents; and
- Provide advice and present clinical practice guidelines to the Quality of Care and Health Outcomes Committee.

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Membership of the Working Party

Dr Justin O'Day (Chairman)	Ophthalmologist; Past President, Royal Australian College of Ophthalmologists
Dr Peter Colman	Endocrinologist
Ms Jill Grasso	Clinical Nurse Consultant (Ophthalmology)
Dr Mark McCombe	Ophthalmologist
Ms Norah McGuire	Consumer representative
Assoc Professor Paul Mitchell	Ophthalmologist; Associate Professor, Dept of Ophthalmology, University of Sydney
Mr Peter Montgomery	Optometrist; President, Australian Optometrical Association (Qld)
Dr Mark Santini	General practitioner
Professor Hugh Taylor	Ophthalmologist; Professor, Dept of Ophthalmology, University of Melbourne, Director WHO Collaborative Centre for Prevention of Blindness
Dr Andrew Wilson	Epidemiologist; Director, Clinical Policy, NSW Health Department
Ms Joan Vickery	Aboriginal and Torres Strait Islander representative
Ms Sharon Tuffin	Office of the NHMRC

Consultant writers

Associate Professor Paul Mitchell

Ms Raelene Allen

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Appendix B Some medical terms explained

Cataract: The lens of the eye becomes opaque, usually as a result of ageing. This can happen earlier in people with diabetes.

Diabetes mellitus: A number of conditions which all have in common a high blood sugar. This includes both insulin dependent (type 1) and non insulin dependent (type 2) diabetes.

Fluorescein angiography: A test conducted after injecting dye into a vein in the arm or hand. It can highlight the tiny blood vessels in the retina so that signs of macular oedema or new blood vessels can be seen.

Glaucoma: A disease of the optic nerve, which can lead to loss of sight. Signs suggesting glaucoma include raised eye pressure and changes in the optic disc, which is seen using an ophthalmoscope. Glaucoma usually has no symptoms, and may not be picked up until vision has been affected.

Insulin: a hormone produced by the pancreas, which lowers blood sugar.

Macular oedema: This term refers to swelling or small fatty deposits which occur near the centre of vision at the back of the eye. Macular oedema is the commonest cause for worsening sight in people with diabetes.

Non-mydriatic camera: a camera used for taking photos of the retina without dilating the pupils.

Non-proliferative diabetic retinopathy: also known as background retinopathy. It simply means early retinopathy.

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Panretinal laser: application of laser over outer retinal areas. It is the main treatment for proliferative retinopathy, and usually takes more than one session.

Proliferative diabetic retinopathy: Advanced stage of retinopathy where abnormal new blood vessels or scarring occur in the retina. Bleeding of these vessels can occur because the vessels are so fragile. Retinal detachment can occur when scar tissue contracts.

Pupil dilation: short acting eye drops are used to open up the pupils. This is essential when checking for retinopathy with an ophthalmoscope.

Vitrectomy: a surgical procedure to remove vitreous haemorrhage or scar tissue which may be pulling on the retina.

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Appendix C Contacts

For more information about diabetes or diabetic retinopathy contact:

Diabetes Australia at its National or State/Territory Offices

National Office	02 6285 3277
State/Territory Office (toll free)	1800 640 862

Other organisations you may like to contact:

Australian Diabetes Society	02 9256 5462
Australian Diabetes Educators Association	02 6282 5854
Australian Optometrical Association	03 9663 6833
Commonwealth Department of Health and Family Services	02 6289 1555
National Health & Medical Research Council	1800 020 103
Royal Australian College of Ophthalmologists	02 9267 7006
Royal Australasian College of General Practitioners	03 9214 1414
National Association of Diabetes Centres	02 9256 5462
National Aboriginal Community Controlled Health Organisations	02 6282 7513

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