

Diabetic Retinopathy

And Other Eye Complications of Diabetes

If you have diabetes, it is vital that you have your eyes checked regularly. Retinopathy (damage to the retina at the back of the eye) is a common complication of diabetes. If left untreated, it can get worse and cause some loss of vision, or blindness in severe cases.

Good control of blood glucose and blood pressure slows down the progression of retinopathy. Treatment with a laser, before the retinopathy gets severe, can often prevent loss of vision. Glaucoma and cataracts are more common in people with diabetes.

What is diabetic retinopathy?

What is diabetes?

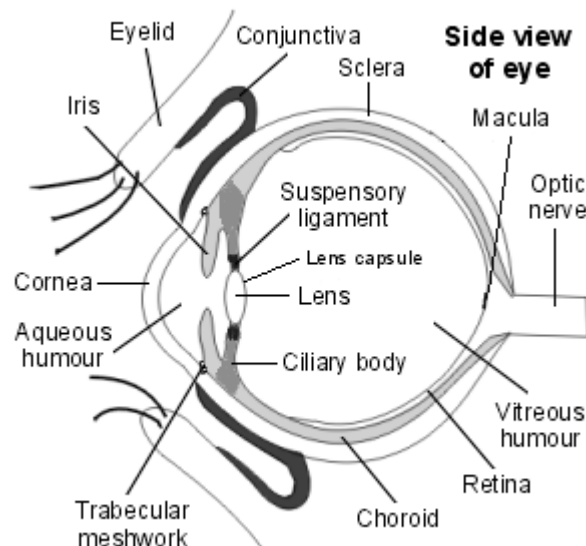
Diabetes mellitus (just called diabetes from now on) occurs when the level of glucose (sugar) in the blood becomes higher than normal. There are two main types of diabetes - Type 1 and Type 2. See separate leaflets called '*Type 1 Diabetes*' and '*Type 2 Diabetes*' for more general information about diabetes.

What is the retina?

The retina is made up from special cells called rods and cones which line the back of your eyes. Light enters your eye and passes through the lens which focuses the light onto the retina. Messages about what you see are then passed from the cells in the retina to the optic nerve, and on to the brain. There are many tiny blood vessels next to the retina which take oxygen and nutrients to the cells of the retina.

What is retinopathy?

The term 'retinopathy' covers various disorders of the retina which can affect vision. Retinopathy is usually due to damage to the tiny blood vessels next to the retina. Retinopathy is commonly caused by diabetes, but is sometimes caused by other diseases such as very high blood pressure.



How does diabetic retinopathy occur?

Over several years, a high blood glucose (sugar) level can weaken and damage the tiny blood vessels next to the retina. This can result in various problems which include:

- Small 'blow-out' swellings of blood vessels (microaneurysms).
- Small leaks of fluid from damaged blood vessels (exudates).
- Small bleeds from damaged blood vessels (haemorrhages).
- Blood vessels may just become blocked. This can cut off the blood and oxygen supply to small sections of the retina.
- New abnormal blood vessels may grow from damaged blood vessels. This is called proliferative retinopathy. These new vessels are delicate and can bleed easily.

The leaks of fluid, bleeds and blocked blood vessels may damage the cells of the retina. In some severe cases, damaged blood vessels bleed into the vitreous humour (the jelly-like centre of the eye). This can also affect vision by blocking light rays going to the retina.

Different types of diabetic retinopathy

Different parts of the retina can be affected

The macula is a small part of the retina which is roughly in the centre at the back of the eye. The macula is where you focus your vision. So, when you read or look at an object, the light focuses on the macula. The central and most important part of the macula is called the fovea. The outer part of the retina is used for peripheral vision.

Retinopathy can affect the macula (when it is called maculopathy), the peripheral (outer part) of the retina, or both. It is much more serious if the macula is affected.

The severity of the retinopathy can vary

Retinopathy usually develops gradually and tends to become worse over a number of years.

- *Background retinopathy* is not too serious. With this you have some tiny microaneurysms, and tiny leaks of fluid and tiny bleeds in various parts of the retina. A doctor or optometrist can see these as tiny 'dots' and 'blots' on the retina when they examine the back of the eye. Your vision is not usually affected if you have background retinopathy.
- *Pre-proliferative retinopathy* is more extensive than background retinopathy, but not yet showing new blood vessels growing (see below).
- *Proliferative retinopathy* means you have new blood vessels growing in some part or parts of the retina. These are thought to develop because damaged blood vessels in the retina make chemicals called growth factors. These can cause new tiny blood vessels to grow (proliferate) from the damaged blood vessels. This may occur as the retinal blood vessels try to fix or compensate for the damage by making new blood vessels. However, these new blood vessels are not normal. They are delicate, and can easily bleed which can damage the cells of the retina. In this type of retinopathy, without laser treatment, vision is likely to become badly affected.

If proliferative retinopathy becomes severe then many abnormal new blood vessels grow. You may then have a lot of damage and scarring on the retina from bleeds and leaks. Parts of the retina may also detach from the back of the eye.

The effects of retinopathy may be different in each eye. Also, if you have high blood pressure in addition to diabetes, it can make retinopathy worse, or progress more quickly.

Who gets diabetic retinopathy?

Retinopathy is the most common complication of diabetes. The longer you have diabetes, the more likely retinopathy will develop. Twenty years after the onset of diabetes, some degree of retinopathy will have developed in almost all people with Type 1 diabetes, and in about 6 in 10 people with Type 2 diabetes. Even when Type 2 diabetes is first diagnosed, some degree of background retinopathy is seen in about 1 in 4 cases.

Can diabetic retinopathy be prevented?

You are less likely to develop retinopathy, or if you have mild (background) retinopathy it is less likely to progress to more serious retinopathy, if:

- your blood glucose level is well controlled. Treatment to control blood glucose is discussed in another leaflet. Briefly it involves: a healthy diet, losing weight if you are overweight, regular exercise, and medication if required.
- your blood pressure is well controlled.

Some studies also suggest that smoking may make retinopathy worse. Therefore, you are also advised to stop smoking if you smoke.

Eye checks for diabetic retinopathy

Treatment can prevent loss of vision and blindness in most cases. Therefore, if you have diabetes it is vital that you have regular eye checks to detect retinopathy before your vision becomes badly affected. You should have at least an annual eye check.

In the UK, the NHS offers a free detailed eye check each year to all people with diabetes over the age of 11. Make sure that you get your appointment each year and tell your doctor if you do not.

The test includes:

- Testing your vision.
- Looking at the back of the eye with a light to examine the retina.
- Taking photographs of your retina (to compare with previous examinations).

To examine your eyes properly you will have drops put into your eyes to make the pupil as wide as possible. The drops can make your vision blurry for up to six hours. This can affect your ability to drive so you should not drive to or from the place where the test is carried out.

If you are found to have mild (background) retinopathy, and your vision is not affected, then you are likely just to be monitored and re-checked every few months. The retinopathy may not progress to more serious forms, particularly if your diabetes and blood pressure are well controlled. If more severe changes are detected you may be referred to an eye specialist for a detailed eye examination, and treatment if necessary.

Note: if you notice any change in your vision before you are due a routine check, tell your doctor or optometrist who should arrange an eye-check earlier.

What is the treatment for diabetic retinopathy?

Laser treatment

Laser treatment is used mainly if you have new vessels growing (proliferative retinopathy), or if any type of retinopathy is affecting the macula. A laser is a very bright light that is very focused so it makes tiny burns on whatever it is focussed on. A 'burn' can seal leaks from blood vessels, and stops new vessels from growing further. The burns are so tiny and accurate that they can treat a tiny abnormal blood vessel. Several hundred 'burns' may be needed to treat retinopathy.

Treatment usually works well to prevent retinopathy from getting worse, and so often prevents loss of vision or blindness. However, laser treatment cannot restore vision that is already lost.

Other treatments

Various eye operations may be needed if you have a bleed into the vitreous humour, or develop a detached retina (which are possible consequences of severe retinopathy).

Other eye complications of diabetes

- **Cataracts** are more common in people with diabetes. A cataract is when the lens of an eye becomes cloudy. This affects vision as it blocks light getting to the back of the eye. Cataracts can usually be treated with a routine 'day case' operation where the cloudy lens is removed and is replaced with an artificial plastic lens.
- **Glaucoma** may be more common in people with diabetes (although this is not certain as glaucoma is common anyway). Glaucoma can cause a painless rise in pressure in the eye. If left untreated, glaucoma can damage the eye and cause loss of vision. Regular eye checks can detect glaucoma in the early stages.

See separate leaflets called '*Cataracts*' and '*Glaucoma*' for details.

Further help and information

Diabetes UK 10 Parkway, London, NW1 7AA
Tel (careline): 0845 120 2960 (lo-call rate) Web: www.diabetes.org.uk

National Screening Programme for Sight-Threatening Diabetic Retinopathy
www.nsc视网膜opathy.org.uk

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