

Patient Information Brochure

Diabetes and Diabetic Retinopathy

Q: What is vitreous?

A: The eye is a ball of about 2.5cm diameter. The cornea and lens at the front of the eye focus light onto the retina (Figure 1). The eye is similar to a camera, with the focusing lenses in front, and the light sensitive film (retina) lining the back. The vitreous is the clear gel (jelly) which fills up the space inside the eyeball, behind the iris (the blue or brown part) and the lens.

Q: What is retina?

A: Retina lines the inside of the wall of the eye. The retina transforms light into electrical impulses, which travel up the optic nerve to the brain.

Q: What is macula?

A: The macula is the central part of the retina. It is a small, specialized area in the middle of the retina and is responsible for our ability to see fine detail. This central vision is the vision we use for reading, driving, recognising faces, threading needles and other fine detailed work. The remaining part of the retina is responsible for our side vision, also known as peripheral vision. This is our mobility vision, allowing us to get about and to maintain our independence.

Q: How do we see?

A: Our eyes are like a camera with a lens system at the front of the eye, and the retina, like a photographic film, lining the inside wall of the back of the eye. Light passes through the cornea, pupil and lens and is focused on the light sensitive retina to form an image. Messages are sent via the optic nerve to the brain for processing.

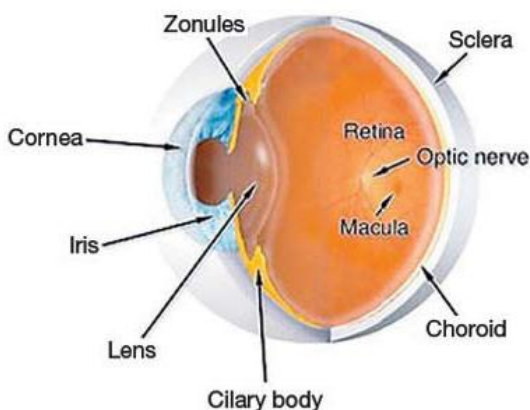


Fig 1. Normal Eye

Q: How does diabetes affect the eye?

A: Diabetes can affect the eye in several ways. It can damage your sight by causing cataract, but also more importantly, by causing diabetic retinopathy.

Q: What is diabetic retinopathy?

A: Diabetic retinopathy is a potentially blinding complication of diabetes that affects up to a half of diabetics to some degree. At first you may notice no changes in your vision, but diabetic retinopathy can worsen over the years and damage your sight. *With timely treatment*, over 80% of people with advanced diabetic retinopathy can be prevented from going blind. We recommend every diabetic have an eye exam through dilated pupils at least every two years.

Both type 1 and type 2 diabetics are at risk of diabetic retinopathy. Pregnancy is a relatively high risk period for worsening of diabetic retinopathy and close follow up during pregnancy is recommended.

Q: How does diabetic retinopathy affect vision?

A: Diabetic retinopathy occurs when the small blood vessels in the retina become damaged by high blood sugar levels. It affects the eyes in two forms.

Macular oedema describes the condition where retinal blood vessels develop tiny leaks in the very centre of the retina. When this occurs, blood, fluid and lipids leak out causing swelling of the macula.



Fig 2. Small bleeds and areas of blood vessel leakage in an eye with macular oedema. Yellow deposits are lipid.

Proliferative diabetic retinopathy describes the changes that occur when abnormal blood vessels begin growing on the surface of the retina. These new blood vessels have a tendency to bleed or cause adjacent scar tissue growth. Leaking blood from these blood vessels can cloud the vitreous jelly that fills the centre of the eye and cause severe blurring. Scar tissue formation can lead to retinal detachment, which if left untreated often leads to blindness. If these abnormal blood vessels start growing around the pupil you can also develop a diabetic type of glaucoma, which can be very difficult to treat.

Q: What are the symptoms of diabetic retinopathy?

A: Many people with severe sight threatening diabetic retinopathy have no eye symptoms at all and therefore regular checks are required to allow treatment to be applied before it is too late. The common symptoms are:

- 1) Blurred vision and difficulty reading
- 2) Sudden loss of vision in one eye
- 3) Dark spots floating around inside the eye

If you have these symptoms, it doesn't mean you definitely have diabetic retinopathy, but you should have your eyes checked.

As part of your eye examination, you may occasionally be asked to have special imaging tests performed called OCT scans and fluorescein angiograms.

Q: How can I prevent diabetic retinopathy?

A: Unfortunately, one cannot prevent diabetic retinopathy. It is a progressive disease. Having regular eye checks every 1 to 2 years is the most important thing you can do. Good blood sugar control and blood pressure control also reduce the risk of developing advanced diabetic retinopathy. Regular physical exercise is important to control diabetes and diabetic retinopathy.

Q: What is the treatment of diabetic retinopathy?

A: In most early cases of diabetic retinopathy, treatment is not required, but ongoing observation is still needed. When required, it can be any of the 3 means, depending on the type and stage of retinopathy.

Laser surgery is the mainstay of diabetic retinopathy treatment. It is done for both macular oedema and Proliferative diabetic retinopathy. Proliferative diabetic retinopathy requires upto 3 sittings of laser on 3 different (could be consecutive) days. This is usually a clinic procedure that means you don't need to go to the operating theatre. The laser is applied through a contact lens system. During the procedure you will see bright lights in your vision. For the rest of the day your vision may be blurred and the eye may feel a little bruised.

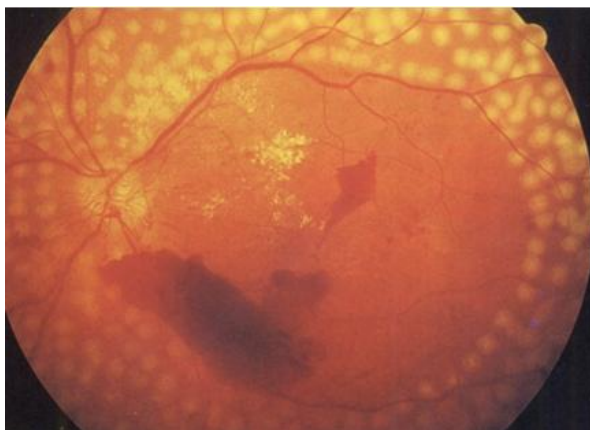


Fig 3. Multiple laser spots applied to the retina to treat proliferative diabetic retinopathy

Laser treatment has its limitations. The main aim of laser is to maintain existing vision and prevent further vision loss. Occasionally bleeding can happen following the procedure, in proliferative diabetic retinopathy due to the disease itself and not due to laser.

Injections into the eye of various drugs are required to stabilize diabetic retinopathy mainly macular oedema. This sometimes has to be repeated and may be required in conjunction with laser treatment or vitrectomy surgery. **Presently, injections with laser are the preferred treatment option for macular oedema, with results better than laser alone.**

Vitrectomy surgery is occasionally performed on eyes with advanced diabetic eye disease. If you have a lot of blood in the vitreous jelly, removal of the jelly with a vitrectomy will clear away the cloudiness in your vision. Sometimes this surgery is also performed if you have a retinal detachment associated with your diabetic retinopathy. A vitrectomy is usually a local anaesthetic procedure, which means you will be awake at the time, with the eye fully numbed.

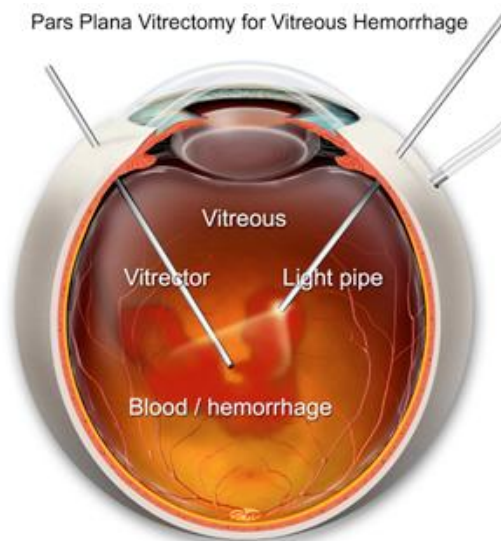


Fig 4. Vitrectomy Surgery

Q: What are the injections to be given in the eye? Are they painful? What are the risks?

A: Currently we have three options in injections.

1. Treatment with Lucentis or (Accentrix in India)(Ranibizumab)

There is a new treatment that is effective in improving vision and clearing macular edema in diabetic retinopathy. It is injection of Lucentis into the eye once a month for at least six months. Lucentis is an antibody against the molecule that causes macular

edema and the growth of abnormal vessels (Vascular Endothelial Growth Factor or VEGF)

Vision improvement is rapid and seen on average, by seven days. Patients are treated with three to six monthly injections. After six months it may be possible to stop the treatment, but this varies from patient to patient. If the vision is down, we usually restart treatment immediately. If vision is good and there is no macular edema, observation may be continued.

2. Treatment with Avastin (Bevacizumab)

This is another Anti –VEGF drug, which is FDA approved for treatment of cancers and has also been shown to work for macular edema. Research has proven it to be equally effective and safe as Lucentis.

We prefer to use Lucentis when possible and patient permitting, because it is the drug that has been shown to work in large clinical trials and is prepared under strict and specific FDA guidelines for use inside the eye.

3. Treatment with Steroids

They are used only in diabetic macular edema.

Intraocular steroid injections like triamcinolone (IVTA) and Ozurdex are another treatment option. The duration of action is much longer and so the need for less frequent injections. In some cases like persistent macular edema, they are more effective than anti-VEGF injections.

However there is a significantly higher risk of glaucoma and cataracts in patients given steroid injections, especially if they are repeated.

Ozurdex is a long acting steroid implant, which contains a different steroid, dexamethasone. The duration of action is for about 4 months. The risk of cataract and glaucoma is marginally less than triamcinolone (IVTA).

While Lucentis is a better, safer option for most cases, sometimes steroid treatment by itself or in combination with Lucentis may be warranted.

Both Avastin and Lucentis are used in diabetic macular edema as well as in proliferative diabetic retinopathy, especially prior to surgery.

All the above injections are given under topical anaesthesia. So they don't cause any pain. All the injections have a risk of eye infection and retinal detachment. Thankfully these are very rare. The additional risks with steroid injections are mentioned above.

Q: What is end result of diabetic retinopathy?

A: Patients who have milder disease and have got treatment at appropriate time end up having moderate to good vision. Patients with advanced disease, inspite of treatment have moderate to poor vision *depending on the blood supply to the retina and macula and health of the retina.*