



Diabetic Retinopathy

What is diabetic retinopathy?

Diabetic retinopathy is damage to the retina caused by the complications of diabetes, which can eventually lead to blindness.

Diabetic retinopathy may not be noticed straight away but over time diabetic retinopathy can get worse and cause vision loss. Diabetic retinopathy usually affects both eyes.

What are the 3 most common clinical presentations of diabetic retinopathy?

1. **Diabetic Macular Oedema** - It occurs when the damaged blood vessels leak fluid and lipids onto the macula, the part of the retina that lets us see detail. The fluid makes the macula swell, which blurs vision.
2. **Proliferative Diabetic Retinopathy** – is another form of diabetic eye damage, an overgrowth of new blood vessels in the retina. This overgrowth generally happens years after diabetes has been diagnosed. Without timely treatment, these new blood vessels can bleed, cloud vision, and destroy the retina.
3. **Early Diabetic Retinopathy no Treatment** - This is an early form of the disease, where the retinal blood vessels leak fluid or bleed. If these are small in total area, they can have a minimal effect on sight and may not need treatment.

What are the stages of diabetic retinopathy?

Diabetic retinopathy has four stages:

1. **Mild Nonproliferative Retinopathy**- at this early stage, tiny retinal blood vessels begin to swell (microaneurysms).
2. **Moderate Nonproliferative Retinopathy**- In this stage, blood vessels that nourish the retina are blocked and there is often some mild bleeding.
3. **Severe Nonproliferative Retinopathy**- More blood vessels are blocked, stopping the retina from receiving its blood supply. These areas of the retina send signals to grow new blood vessels for nourishment.
4. **Proliferative Retinopathy**- At this advanced stage, the signals sent by the retina begin the growth of new blood vessels. These new blood vessels are abnormal and fragile but by themselves, they do not cause symptoms or vision loss. However If a blood vessel leaks, severe vision loss and even blindness can occur.

Causes of vision loss in diabetic retinopathy?

Vision loss in diabetic retinopathy can occur in two ways:

1. The first as mentioned above is proliferative retinopathy where blood vessels grow into the eye, causing bleeding inside the eye (vitreous haemorrhage), retinal detachment and severe glaucoma (rubeosis).
2. The second is when fluid leaks into the center of the macula, where our fine, detailed vision occurs. This is known as macular oedema. The fluid makes the macula swell, blurring vision.



Normal vision



Same scene viewed by a person with diabetic retinopathy

Who is at risk for diabetic retinopathy?

All people with diabetes are at risk. That's why everyone with diabetes should get a comprehensive dilated eye exam at least once a year. The longer someone has diabetes, the more likely he or she will get diabetic retinopathy.

Does diabetic retinopathy have any symptoms?

Often no symptoms are present in the early stages of the disease. **Don't wait for symptoms.** Be sure to have a comprehensive dilated eye exam at least once a year.

Detecting diabetic retinopathy and macular edema

Diabetic retinopathy and macular edema are detected during a comprehensive eye exam that includes:

1. **Visual acuity test** - measures how well you see at various distances.
2. **Dilated eye exam** - your pupils are dilated which allows the eye doctor to see the inside of your eyes to check for signs of diabetic retinopathy.
3. **Optical Coherence Tomography (OCT)** - this is an optical imaging machine that produces images of the macula that allows for the observation of swelling or leakage.
4. **Fluorescein angiogram** - a special dye (fluorescein) is injected into your arm. Pictures are taken as the dye passes through the blood vessels in your retina. The test allows your eye care professional to identify any leaking blood vessels and recommend treatment.

How is diabetic retinopathy treated?

Treatment is dependent on the stage and progression of the disease.

In the first three stages of diabetic retinopathy, no treatment is needed. In these stages, people with diabetes should control their blood sugar levels, blood pressure, and cholesterol to prevent progression. HbA1c is the best measure of blood sugar levels and ideally should be between 6 and 7. Please bring these results to your appointment.

Proliferative retinopathy is treated with a procedure called pan retinal photocoagulation laser. Laser treatment shrinks the abnormal blood vessels by applying laser burns to the retina away from the macula. Usually four or more sessions are required to complete treatment. Laser treatment may damage some side vision, slightly reduce color vision and night vision but can save the rest of your sight.

Macular oedema is usually treated by a combination of Avastin and Laser. Avastin “seals” up the blood vessels so they leak less. Laser surgery is known as focal laser treatment. This treatment places small laser burns in the areas around the macula where leakage has occurred. The burns increase the pumping of fluid out of the retina and will reduce the amount of fluid in the retina. A patient may need focal laser surgery and Avastin many times to control the leaking fluid.

If the bleeding is severe, you may need a surgical procedure called a vitrectomy. During a vitrectomy, blood is removed from the center of your eye.

What happens during laser treatment?

Both focal and pan retinal laser treatment are performed in your doctor's office. Your pupils will be dilated and anesthetic drops will be used to numb the eye.

During the procedure, you may see flashes of light. These flashes may create a stinging sensation that can be uncomfortable. You will need someone to drive you home after surgery. Because your pupil will remain dilated for a few hours, you should bring a pair of sunglasses.

Avastin and laser surgery can significantly reduce the risk of blindness, however, they often cannot restore vision that is already lost. That is why finding diabetic retinopathy early is the best way to prevent vision loss.