

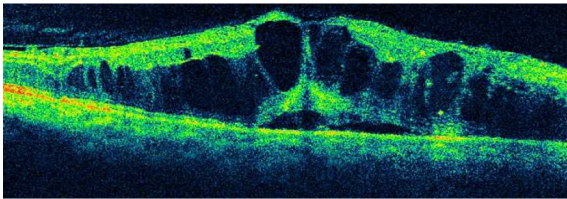
How is diabetic retinopathy diagnosed?

Getting an eye exam is the best way to detect any changes inside your eye. If diabetic retinopathy is found, your doctor will order a fluorescein angiography tests where a dye is injected into your arm to detect where fluid is leaking in your eye, or where abnormal blood vessels are.

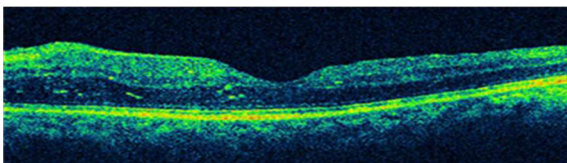
How is diabetic retinopathy treated?

Intravitreal Injections

- A common treatment for diabetic retinopathy are injections in the eye with a drug called Avastin. This drug is a **VEGF** blocker which targets specific chemicals in your body that cause swelling and growth of abnormal blood vessels in the retina.



(OCT scan before intravitreal injection showing diffused cystic macular edema)



(OCT scan before intravitreal (OCT scan after intravitreal injection showing resolution of macular edema)

Laser Surgery:

- Once diabetic retinopathy has progressed laser surgery is recommended for people with macular edema, PDR, and neovascular glaucoma.
- In laser surgery for macular edema, which is performed in the office, the laser is focused on the retina near the macula to decrease the amount of fluid leaking. The purpose of the treatment is to stop and prevent further leakage and loss of vision.
- For patients with PDR, the laser is focused on all other areas of the retina except the macula.
- This treatment prevents abnormal blood vessels from growing and causes the new abnormal blood vessels to shrink. Vitreous bleeding can also decrease by **panretinal photocoagulation**.

Vitrectomy:

- In advanced PDR, a vitrectomy may be recommended by your retina surgeon. During the surgery, which is performed in an operating room, the blood-filled vitreous is replaced by a clear solution.
- Vitrectomy prevents further bleeding by removing the abnormal vessels that were causing the fluid leakage and bleeding.
- If the patient's retina is detached, it can be repaired during a vitrectomy surgery. Surgery should be done early as macular distortion or tractional retinal detachment will cause permanent visual loss.

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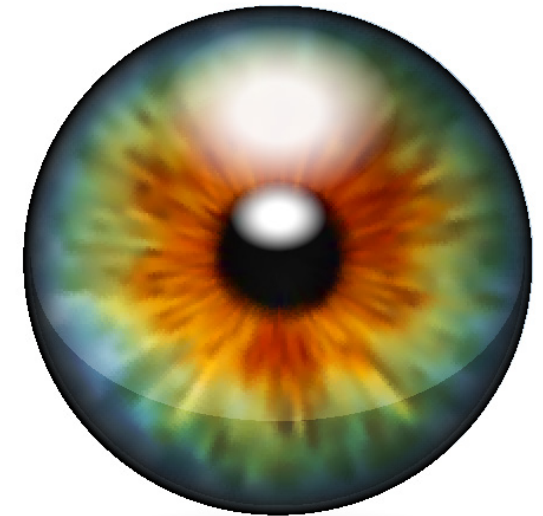
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A Closer Look at Diabetic Retinopathy



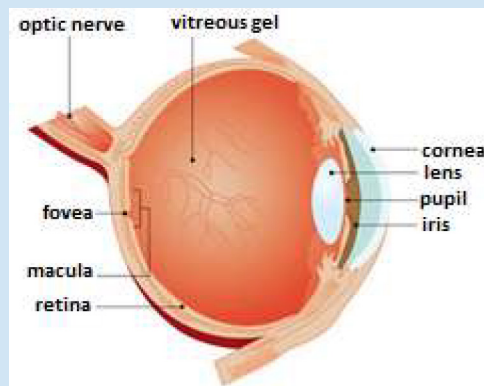
Patient Education

How diabetes can affect sight

If you are a person living with diabetes mellitus, your body is not able to use and store sugar properly. Due to high blood sugar levels, blood vessels in the retina become damaged. Damage to the retinal vessels is referred to as diabetic retinopathy.

At first, diabetic retinopathy may cause no symptoms or only mild vision problems. Eventually, however, diabetic retinopathy can result in blindness.

Diabetic retinopathy can develop in anyone who has type 1 diabetes or type 2 diabetes. The longer you have diabetes, and the less controlled your blood sugar is, the more likely you are to develop diabetic retinopathy.



It is important to take prevention seriously – Start by taking control of your blood sugar level, blood pressure, cholesterol & scheduling annual eye exams.

Symptoms

It is possible to have diabetic retinopathy and not know it. In fact, it is uncommon to have symptoms in the early stages of diabetic retinopathy.

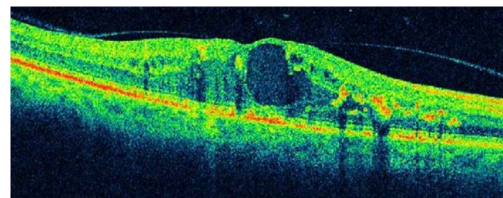
As the condition progresses, symptoms may include: spots or “floaters”; fluctuating vision; dark or empty areas in your vision; difficulty seeing at night; impaired color vision; decreased vision.

Types of Diabetic Retinopathy

There are two types of diabetic retinopathy: **nonproliferative (NPDR)** and **proliferative (PDR)**.

NPDR

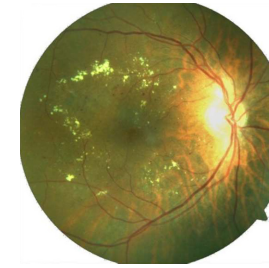
- Commonly known as **background retinopathy**, is the early stage of diabetic retinopathy.
- Tiny blood vessels inside the retina leak blood or fluid. The leaking fluid causes the retina to swell or form *exudates*.
- Vision becomes affected due to **macular edema** caused by the leaking blood vessels.



(Above is a OCT scan of a patient with macular edema showing fluid and cystic swelling within the retina)

Macular Edema is swelling of a small area in the center of the retina called the macula which allows us to see finer details. The swelling is a result of fluid leaking from retinal blood vessels. Vision loss may

be mild to severe, although peripheral vision is still functional. This type of vision loss is most common in diabetes.



PDR

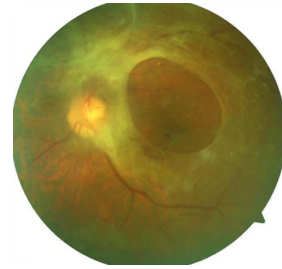
- The most severe type of diabetic retinopathy.
- Abnormal blood vessels grow in the retina in response to the widespread closure of current retinal blood vessels. Sometimes the new blood vessels grow or leak into the clear, jelly-like substance that fills the center of your eye (vitreous).
- Scar tissue may form due to the growth of new blood vessels which cause the retina to detach from the back of the eye. If the new blood vessels interfere with the normal flow of fluid out of the eye, pressure may build up in the eyeball, causing glaucoma.



Vitreous hemorrhage: The new blood vessels that form are fragile and may bleed into the vitreous. Depending on the size of the hemorrhage, a person might see only a few dark spots or it may block the vision completely. It may take days, months or years for the blood to be reabsorbed; if the eye does not clear, a vitrectomy surgery may be recommended.

Tractional retinal detachment:

When PDR is present, the scar tissue associated with neovascularization can shrink which causes wrinkling and pulling on the retina, moving it from its original place.



Neovascular glaucoma: When there is a large amount of retinal vessel closure, new abnormal blood vessels will grow on the iris and block normal fluid flow. This increases the pressure in the eye resulting in neovascular glaucoma which damages the optic nerve.

Schedule an Eye Examination

People with diabetes should schedule an examination at least once a year. Fluctuation in blood sugar can cause changes in both eyes. Remember that vision loss is preventable when detected early. If you have diabetes you can lower your risk of vision loss by maintaining strict control of your blood sugar and visiting your diabetes and eye doctors regularly.

Vision loss is preventable

Early detection of diabetic retinopathy is the best protection against vision loss. By maintaining control of your blood sugar level and visiting your doctor regularly, you can lower your risk of vision loss due to diabetic retinopathy.