Treating Diabetic Retinopathy (DR)

MEDICAL TREATMENT

Studies have shown that **diabetic macular edema (**DME) and **proliferative diabetic retinopathy** (PDR) are controlled by a signal called **vascular endothelial growth factor** (VEGF) sent in response to a damaged retina with poor blood supply. However, an overproduction of VEGF can create abnormal blood vessel growth, as seen in DR. VEGF-blocking drugs (such as Lucentis, Avastin and Eylea) as well as other medications (steroids and steroid implants) can be injected into the eye to treat these conditions. Most offer temporary relief, so they are typically given repeatedly over time.

LASER TREATMENT

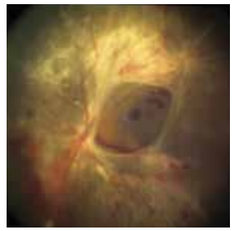
The main goal of laser treatment is to prevent further vision loss. The laser is applied to the damaged retina to reduce fluid and blood leakage by shrinking abnormal blood vessels and preventing them from growing. For patients with DME, the laser is focused in the macula. For patients with more severe PDR, the laser is focused on parts of the retina outside the macula. Multiple laser treatments may be necessary.

SURGICAL TREATMENT

DR can cause a **vitreous hemorrhage** (profuse bleeding in the vitreous). Although most hemorrhages clear on their own over time, **vitrectomy surgery** may sometimes be necessary. In severe cases, an extensive growth of abnormal blood vessels and scar tissue sometimes causes a **tractional retinal detachment,** which also may require surgery.

What can I expect before and during my vitrectomy?
Before surgery, we may recommend a physical exam with your primary care doctor to identify and treat any underlying medical conditions. Most vitrectomy surgeries are performed on an outpatient basis with local anesthesia. However, your surgeon and anesthesiology team will decide whether local or general anesthesia is appropriate for you.

The operation can last between 20 minutes and a couple of hours.. The surgeon will perform the procedure using a microscope and fine instruments that are placed into your eye through small incisions in the **sclera** (white part of the eye). If necessary, other procedures, such as membrane peel or laser application, may be combined with the vitrectomy.



Severe tractional retinal detachment (TRD)

Retina following successful vitrectomy surgery

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DIABETIC RETINOPATHY

What is diabetic retinopathy (DR)?

People with **diabetes** have abnormal blood sugar levels, which affects the eye in many ways. One is **diabetic retinopathy** (DR), which causes progressive damage to the retina—the light-sensitive lining at the back of the eye. It can affect people with Type 1 (insulin dependent) and Type 2 (non-insulin dependent) diabetes.

How diabetic retinopathy affects vision

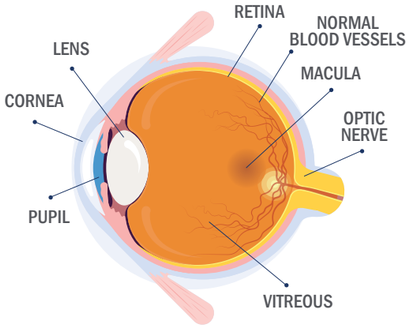
Light enters your eye and is detected by the **retina**, light-sensing nerve tissue at the back of your eye. The information it receives is transmitted through the **optic nerve** to the brain, where it is interpreted as the images you see.

Over time, diabetes damages and weakens the blood vessels in the retina. This causes these tiny blood vessels to swell (**aneurysms**) leak fluid, bleed, and deteriorate, causing poor blood flow. In advanced stages, new abnormal blood vessels grow. All of this can cause vision loss.

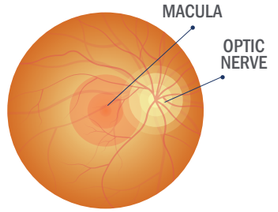
The macula is the part of the retina responsible for central vision. Your central vision allows you to see fine details, as well as read and recognize faces. Your peripheral (side) vision provides less detail but increases your visual field. Diabetic retinopathy can cause both central and peripheral vision loss.

Scan here to watch a video featuring our own Dr. David Brown sharing helpful video about diabetic retinopathy!

HEALTHY EYE

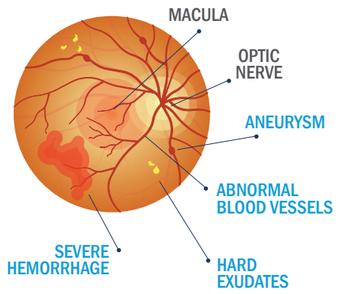


ANGLED VIEW



AFFECTED EYE

ANGLED VIEW



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Stages of Diabetic Retinopathy (DR)

MILD
Early stages of **non-proliferative diabetic retinopathy (NPDR)**

In this stage, excess sugar levels start affecting the tiny blood vessels in the back of your eye, characterized by tiny areas of swelling (micro **aneurysms**) in the blood vessels of the **retina**. At first there might be no changes to your vision.

As the disease advances, increased swelling starts to interfere with blood flow to the retina, leaving it without enough oxygen or nutrients, and causing swelling of the **macula**—the area near the center of the retina that is responsible for sharp, central vision. This is known as diabetic macular edema (DME). DME is the most common reason people with diabetes lose their vision.

MODERATE
More advanced **non-proliferative diabetic retinopathy (NPDR)**

A larger section of blood vessels become blocked, causing a significant decrease in blood flow (**ischemia**). Tiny particles (**exudates**) can form and build up in the retina. Both can cause loss of vision, particularly the central vision needed to see fine detail and perform activities such as reading, recognizing faces and threading a needle.

SEVERE
Proliferative diabetic retinopathy (PDR)

As blood vessels become blocked, the body responds by forming new blood vessels (**neovascularization**) in the retina. Because they are often fragile, there is a higher risk of blood leaking into the gel-filled space in the center of your eye (**vitreous**), causing both central and peripheral vision loss. If the bleeding is minor, you might see a few dark floaters. If it is severe, in can cloud your vision. In some cases, scar tissue develops, which can lead to a retinal detachment. PDR is serious and requires treatment.

Preventing Diabetic Retinopathy

If you have Type 1 or Type 2 diabetes, controlling your blood sugar, blood pressure, cholesterol and weight can reduce your overall risk, including the long-term risk of vision loss from diabetic retinopathy.

Your success in managing your disease relies heavily on cooperation with your primary care physician. This includes checking your blood sugar regularly and sharing these numbers.

Detecting diabetic retinopathy early offers the best chance for maintaining good vision, so patients with diabetes should have a dilated exam with an eye doctor at least once a year. Once DR is diagnosed, more frequent exams may be necessary.

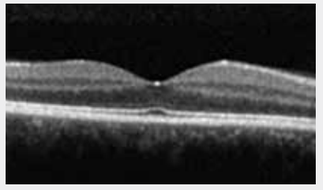
IF YOU HAVE QUESTIONS OR CONCERNS ABOUT ANY DIAGNOSIS OR TREATMENT, IT IS IMPORTANT TO DISCUSS THEM WITH YOUR RETINA SPECIALIST.

Examination and diagnostic testing

Your doctor will test for DR with an eye exam. During the exam, your eyes will be dilated and your doctor may use different diagnostic imaging tools such as **Optical Coherence Tomography (OCT)**, which uses light waves to take cross-section pictures of your retina, and **Fluorescein Angiography (FA)**, which uses dye injected into the peripheral veins to highlight and photograph the blood vessels in the back of the eye.

NORMAL EYE

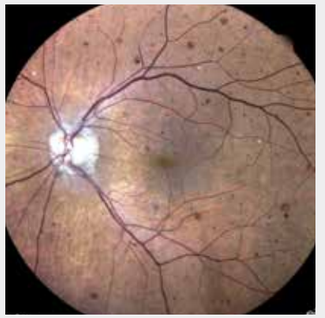
Normal macula



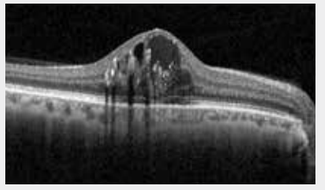
Normal macula, as seen on OCT

Normal macula, as seen on FA

MILD - MODERATE (NPDR)



Non-Proliferative Diabetic Retinopathy (NPDR)

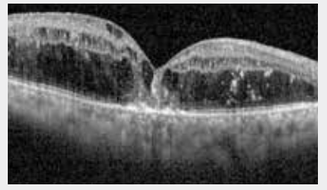


DME with retinal thickening, cysts and subretinal fluid, as seen on OCT

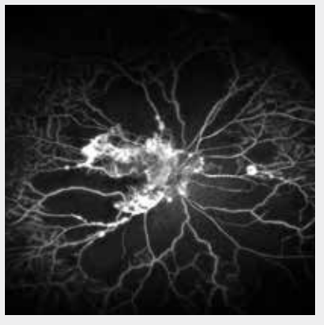
Moderate NPDR with small hemorrhages—but no neovascularization or leakage—as seen on FA

SEVERE (PDR)

Proliferative Diabetic Retinopathy (PDR)



Severe DME with retinal thickening, cysts and subretinal fluid, as see on OCT



Severe PDR with abnormal blood vessels leaking blood in front of retina, as seen on FA