

# DIABETIC RETINOPATHY



## Diabetes can affect sight

If you have diabetes mellitus, high blood-sugar levels can damage blood vessels in the retina, the nerve layer at the back of the eye that senses light. The damage to retinal vessels is referred to as diabetic retinopathy.

## Types of diabetic retinopathy

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

### NPDR

Commonly known as background retinopathy, it's an early stage of diabetic retinopathy. In this stage, tiny blood vessels within the retina leak blood or fluid. The leaking fluid causes the retina to swell or to form deposits called exudates.

Many people with diabetes have mild NPDR, which usually does not affect their vision. When vision is affected it is usually the result of macular edema.

Macular edema is swelling, or thickening, of the macula, a small area in the center of the retina that allows us to see fine details clearly. The swelling is caused by fluid leaking from retinal blood vessels. It is the most common cause of visual loss in diabetes. Vision loss may be mild to severe, but even in the worst cases, peripheral vision continues to function.

Macular ischemia occurs when small blood vessels (capillaries) close. Vision blurs because the macula no longer receives sufficient blood supply to work properly.

### PDR

PDR is present when abnormal new vessels begin growing on the surface of the retina or optic nerve. The main cause of PDR is widespread closure of retinal blood vessels, preventing adequate blood flow. The retina responds by growing new blood vessels in an attempt to supply blood to the area where the original vessels closed.

Unfortunately, the new, abnormal blood vessels do not re-supply the retina with normal blood flow. The new vessels are often accompanied by scar tissue that may cause wrinkling or detachment of the retina. PDR may cause more severe vision loss than NPDR because it can affect both central and peripheral vision.

## Causes for visual loss

Proliferative diabetic retinopathy causes visual loss in the following ways:

### Vitreous hemorrhage

The fragile new vessels may bleed into the vitreous, a clear, jelly-like substance that fills the center of the eye. If the vitreous hemorrhage is small, a person might see only a few new dark floaters. A very large hemorrhage might block out all vision.



Our doctors (from left): Matt Oliva, MD • Paul Imperia, MD • Paul Jorizzo, MD  
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It may take days, months or even years to resorb the blood, depending on the amount of blood present. If the eye does not clear the vitreous blood adequately within a reasonable time, vitrectomy surgery may be recommended.

Vitreous hemorrhage alone does not cause permanent vision loss. When the blood clears, visual acuity may return to its former level unless the macula is damaged.

### **Traction retinal detachment**

When PDR is present, scar tissue associated with neovascularization can shrink, wrinkling and pulling the retina from its normal position. Macular wrinkling can cause visual distortion. More severe vision loss can occur if the macula or large areas of the retina are detached.

### **Neovascular glaucoma**

Occasionally, extensive retinal vessel closures will cause new, abnormal blood vessels to grow on the iris (colored part of the eye) and block the normal flow of fluid out of the eye. Pressure in the eye builds up, resulting in neovascular glaucoma, a severe eye disease that causes damage to the optic nerve.

## **How is diabetic retinopathy diagnosed?**

A medical eye examination is the only way to find changes inside your eye. An eye care specialist can often diagnose and treat serious retinopathy before you are aware of any vision problems. Your doctor dilates your pupil and looks at the inside of your eye.

If your eye doctor finds diabetic retinopathy, he or she may order color photographs of the retina for a special test called fluorescein angiography to find out if you need treatment. In this test a dye is injected in your arm and photos of your eye are taken to detect where the fluid is leaking.

## **How is diabetic retinopathy treated?**

The best treatment is to prevent the development of retinopathy as much as possible. Strict control of your blood sugar will significantly reduce the long-term risk of vision loss from diabetic retinopathy. If high blood pressure and kidney problems are present, they need to be treated.

Laser surgery is often recommended for people with macular edema, PDR and neovascular glaucoma.

For macular edema, the laser is focused on the damaged retina near the macula to decrease the fluid leakage. The main goal of treatment is to prevent further loss of vision. It is uncommon for people who have blurred vision from macular edema to recover normal vision, although some may experience partial improvement. A few people may see the laser spots near the center of their vision following treatment. The spots usually fade with time, but may not disappear.

For PDR, the laser is focused on all parts of the retina except the macula. This panretinal photocoagulation treatment causes abnormal new vessels to shrink and often prevents them from growing in the future. It also decreases the chance that vitreous bleeding or retinal distortion will occur.

Steroid injections can also be helpful in the management of diabetic retinopathy.

Multiple laser treatments over time are sometimes necessary. Laser surgery does not cure diabetic retinopathy and does not always prevent further loss of vision. Sometimes in severe cases a patient may need to see a retinal specialist for more involved surgery.

## **Vision loss is largely preventable**

If you have diabetes, it is important to know that today, with improved methods of diagnosis and treatment, only a small percentage of people who develop retinopathy have serious vision problems. Early detection of diabetic retinopathy is the best protection against loss of vision.

You can significantly lower your risk of vision loss by maintaining strict control of your blood sugar and visiting your eye care specialist regularly.

## **When to schedule an examination**

People with diabetes should schedule examinations at least once a year. More frequent medical eye examinations may be necessary after the diagnosis of diabetic retinopathy.

Pregnant women with diabetes should schedule an appointment in the first trimester because retinopathy can progress quickly during pregnancy.

If you need to be examined for glasses, it is important that your blood sugar be in consistent control for several days when you see your doctor. Glasses that work well when the blood sugar is out of control will not work well when sugar is stable.

Rapid changes in blood sugar can cause fluctuating vision in both eyes even if retinopathy is not present.

You should have your eyes checked promptly if you have visual changes that:

- Affect only one eye.
- Last more than a few days.
- Are not associated with a change in blood sugar.