



**PADEN EYE CARE CENTER**  
Setting the standard for innovative eye care since 1986

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(877) 485-3329

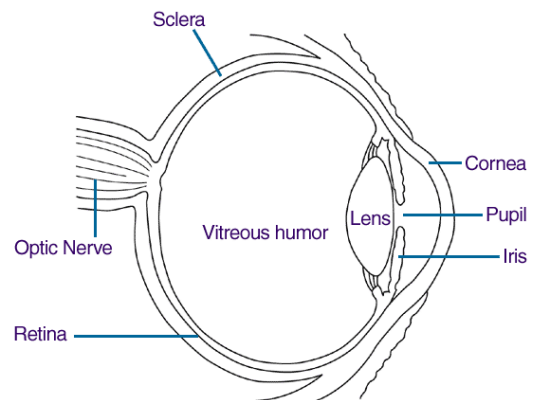
221 Stewart Avenue, Suite 110 • Medford, OR 97501  
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## How can Diabetes affect sight?

If you have diabetes mellitus, your body does not use and store sugar properly. High blood-sugar levels can damage blood vessels in the retina, the nerve layer at the back of the eye that senses light and helps to send images to the brain. The damage to retinal vessels is referred to as diabetic retinopathy.

### What are the 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, is 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 the result of macular edema and/or macular ischemia.

- *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 edema is very treatable if caught early.
- *Macular ischemia* occurs when small blood vessels (capillaries) close. Vision blurs because the macula no longer receives sufficient blood supply to work properly. Prevention is the key to macular ischemia because there is no way to re-open closed capillaries.

PDR is present when abnormal new vessels (neovascularization) 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

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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. 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.

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 losses can occur if the macula or large areas of the retina are detached.

*Neovascular glaucoma*: Occasionally, extensive retinal vessel closure 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 provider can often diagnose and treat serious retinopathy before you are aware of any vision problems. The eye care provider dilates your pupil and looks inside of the eye with an ophthalmoscope.

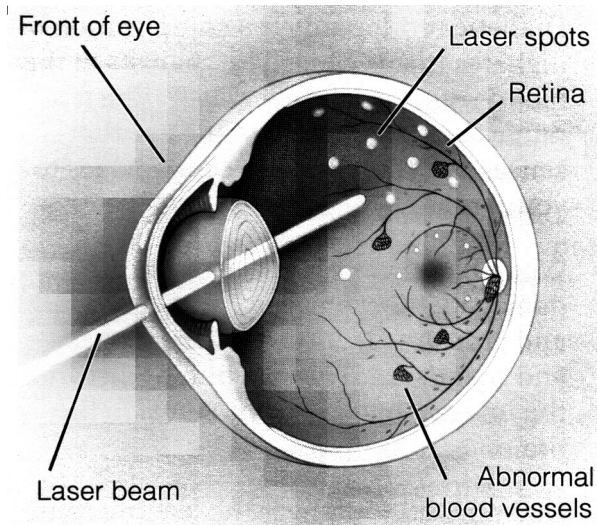
If your eye care provider finds diabetic retinopathy, he or she may order photographs, OCT scans, and/or fluorescein angiography to diagnose and follow the severity of the vascular changes. In fluorescein angiography a dye is injected in your arm and photos of your eye are taken to detect where fluid is leaking.

### **How is Diabetic Retinopathy Treated?**

The best treatment is to prevent the development retinopathy as much as possible. Strict control of your blood sugar and blood pressure 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

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*Laser surgery:* Laser surgery is often recommended for people with macular edema and diabetic retinopathy. For macular edema, the laser is focused on the leaking blood vessels near the macula to decrease the fluid leakage. The main goal of treatment is to prevent further loss of vision. If macular edema is treated early it is common to regain most or all of the lost vision. 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 (PRP) 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. Multiple laser treatments over time are sometimes necessary. Although laser surgery does not cure diabetic retinopathy and does not always prevent further loss of vision, properly done laser can render the retinopathy “quiet” and vision can be stable for decades.

*Vitrectomy:* In advanced PDR, the ophthalmologist may recommend a vitrectomy. During this microsurgical procedure, which is performed in the operating room, the blood-filled vitreous is removed and replaced with a clear solution. The ophthalmologist may wait for several months or up to a year to see if the blood clears on its own before performing a vitrectomy. Vitrectomy often prevents further bleeding by removing the abnormal vessels that caused the bleeding. If the retina is detached, it can be repaired during the vitrectomy surgery. Surgery should usually be done early because macular distortion or traction retinal detachment can lead to permanent visual loss. The longer the macula is distorted or out of place, the more serious the vision loss will be.

### **How can I prevent Vision Loss from Diabetic Retinopathy?**

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, blood pressure and visiting your eye care provider regularly.

### **When should I schedule my eye examinations?**

People with diabetes should schedule an eye examination soon after their diagnosis. The follow up exam will be scheduled based on the findings of the first exam. You will be scheduled back annually, or sooner if your exam shows worrisome changes.

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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 eye care provider. Glasses that work well when the blood sugar is stable may not work well when sugar is out of control.

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.

When you are first diagnosed with diabetes, you should have your eyes checked soon to establish a baseline and then as recommended by your eye care provider.