

Diabetic Retinopathy

Diabetes mellitus is one of the leading causes of irreversible blindness worldwide. In the United States, it is the most common cause of blindness in people younger than 65 years. Severe diabetic eye disease most commonly develops in people who have had diabetes mellitus for many years.

High blood sugar and other abnormalities in metabolism found in people with diabetes mellitus can damage the blood vessels in the body. This damage to the blood vessels leads to poor circulation of blood to various parts of the body. Some of the most sensitive tissues to decreased blood flow and oxygen delivery include the feet, heart kidneys, and eyes. The primary part of the eye affected by diabetes mellitus is the retina. Damage to the retinal blood vessels can lead to bleeding, retinal swelling, poor blood flow to the retina, and scarring of the retina.

Diabetics that have better control of their blood sugar have fewer problems in the long run. The most important method of preventing eye disease related to diabetes is to maintain strict control of blood sugar. High blood pressure and high lipid or cholesterol levels must also be treated as these conditions exacerbate the retinal disease caused by diabetes. In mild cases of diabetic eye disease, vision may be stable for many years. Retinal laser, intraocular injection, and eye surgery can also improve vision in many cases.

There are two major stages of diabetic retinopathy. The earlier stage of diabetic retinopathy is called **non-proliferative diabetic retinopathy**. The later, more advanced stage of diabetic retinopathy is called **proliferative diabetic retinopathy**.

Houston Retina Associates, P.A.

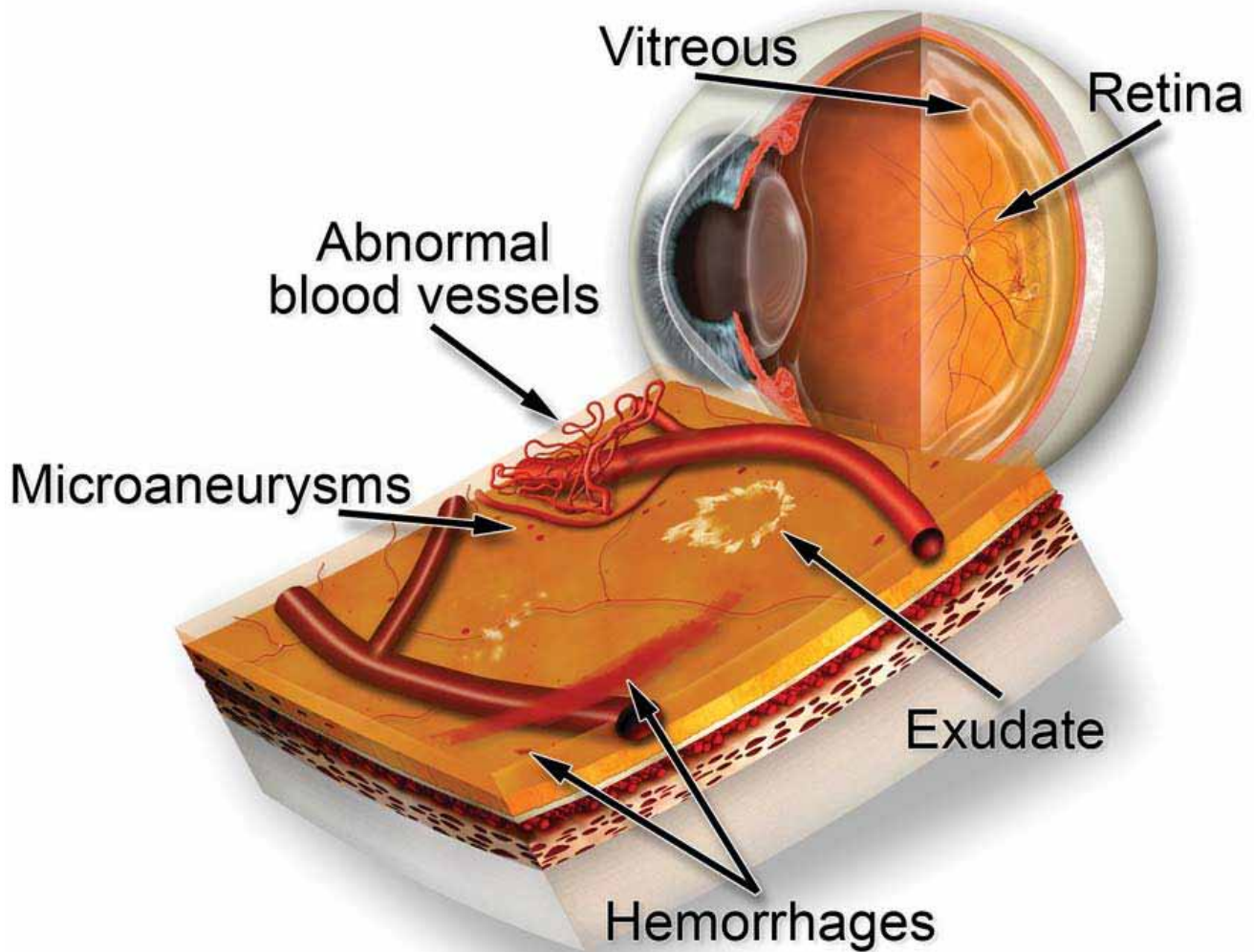
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Non-proliferative Diabetic Retinopathy

Elevated blood sugar levels damage the walls of small blood vessels in the retina. These small blood vessels may begin to “break down” as damage accumulates with time. This leads to the accumulation of fluid (edema), protein deposits (hard exudates) and blood (hemorrhages) inside the retina. Diseased blood vessels will also develop thin walled pouches called microaneurysms, which are one of the earliest signs of diabetic eye disease.

This process of blood vessel damage and leakage in the retina is called background diabetic retinopathy or non-proliferative diabetic retinopathy. If fluid accumulates in the central part of the retina (called the macula), this leads to a condition called diabetic macular edema. In severe cases of blood vessel damage, the small capillaries that supply the center of the vision (macula) may close permanently. This condition is called macular ischemia.

Macular edema and macular ischemia are common causes of visual loss in diabetics. Central visual blur, visual distortion, and/or a blind spot are common symptoms in patients who have moderate to severe macular disease from non-proliferative diabetic retinopathy.

Many patients with non-proliferative diabetic retinopathy have the early stages of the disease and do not require treatment. However, scheduled retinal examinations by an eye doctor are always necessary for patients with diabetic retinopathy.

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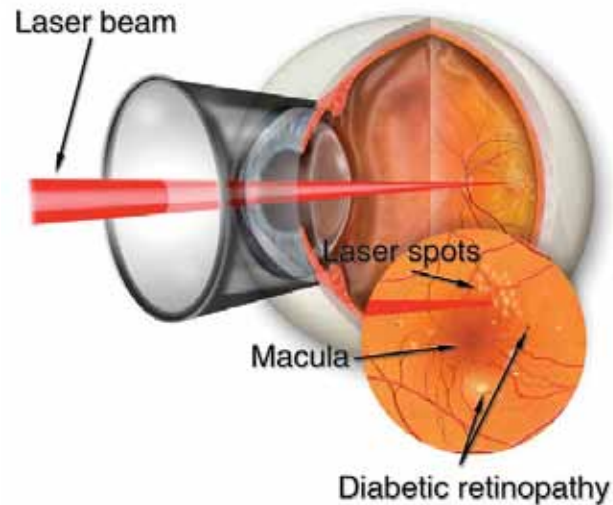
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Treatment: Non-proliferative Diabetic Retinopathy

1. Laser Treatment:

Non-proliferative diabetic retinopathy is treated with laser when there is swelling of the macula. This swelling is called macular edema. Laser treatment is performed in the office and involves focusing a beam of laser light to treat leaking blood vessels and areas of retinal swelling. Macular photocoagulation has been proven to reduce the risk of vision loss from macular edema.



2. Intraocular Injections:

Diabetic macular edema that is resistant to treatment with laser alone, may also be treated with other therapies. Intraocular injections of medicines (e.g. anti-inflammatory steroid injections, Avastin®, and Lucentis®) may be helpful for reducing the macular swelling in some cases.

3. Vitrectomy Surgery:

In certain cases, the vitreous gel and membranes on the surface of the retina can contribute to macular edema. Vitrectomy surgery may be useful in these cases to reduce the macular swelling.

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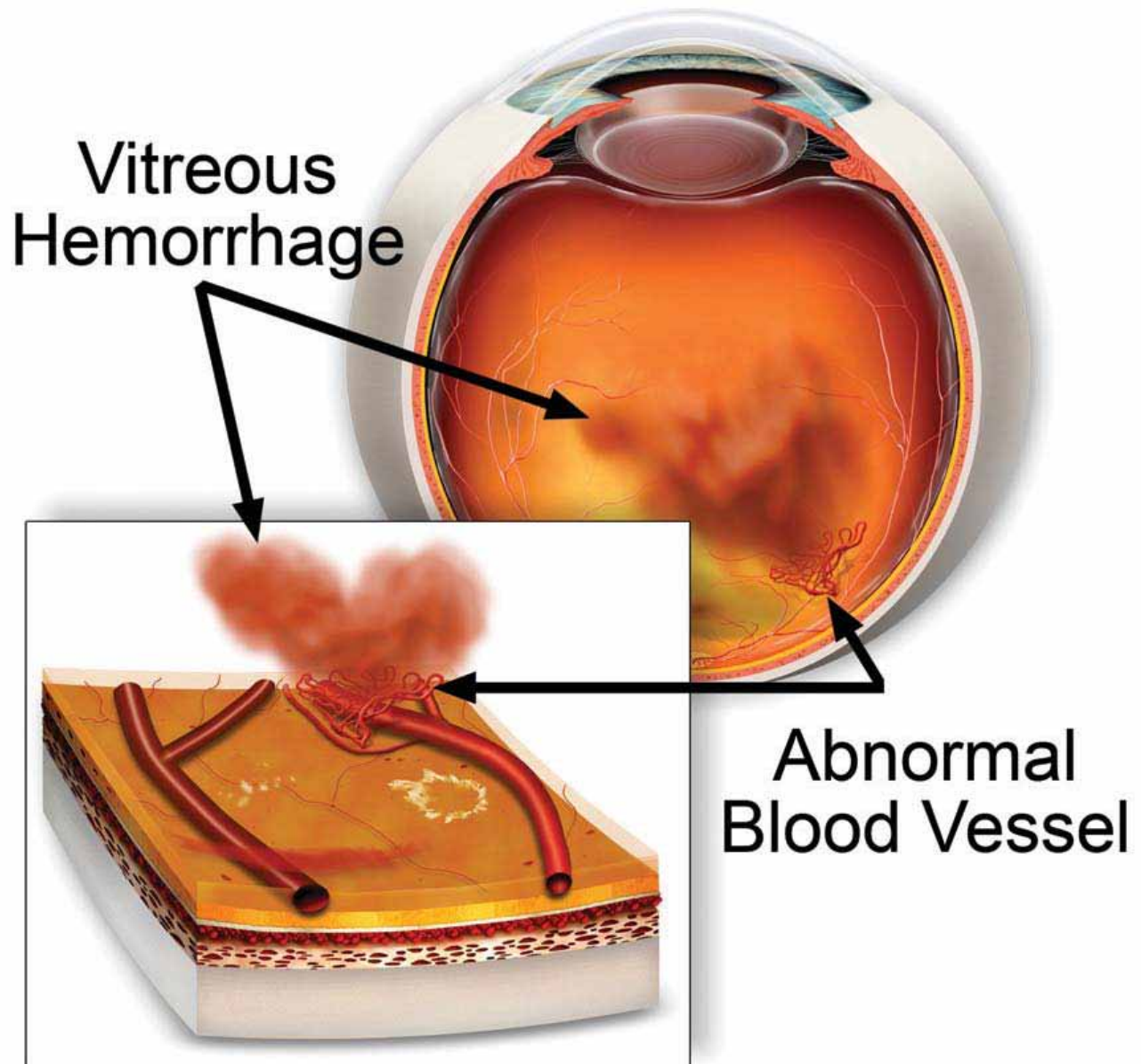
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Proliferative Diabetic Retinopathy



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Proliferative Diabetic Retinopathy

Damage to the blood vessels caused by high blood sugar eventually leads to decreased blood flow and lower amounts of oxygen delivered to the retina. As a response to poor oxygen delivery to the retina, the body may create new blood vessels that grow on the retinal surface. The process of new blood vessel formation is called retinal neovascularization.

Retinal neovascularization is the hallmark of proliferative diabetic retinopathy. While new blood vessels may sound like a good thing, they are actually more harmful than beneficial. The new blood vessels are extremely fragile and unstable. If left untreated, neovascularization can lead to bleeding and scar tissue formation inside the eye. The scar tissue can contract and pull on the retina causing a tractional retinal detachment. This often results in severe vision loss. In advanced stages of the disease, this vision loss may be permanent. Early detection and treatment is important to prevent vision loss from proliferative diabetic retinopathy.

In severe cases, neovascularization can develop in the front of the eye on the iris (the colored part of the eye). If abnormal vessels develop on the iris, they can block the filter that drains fluid from the eye, causing the pressure inside the eye to increase dramatically. This condition is called neovascular glaucoma and can lead to eye pain and further vision loss.

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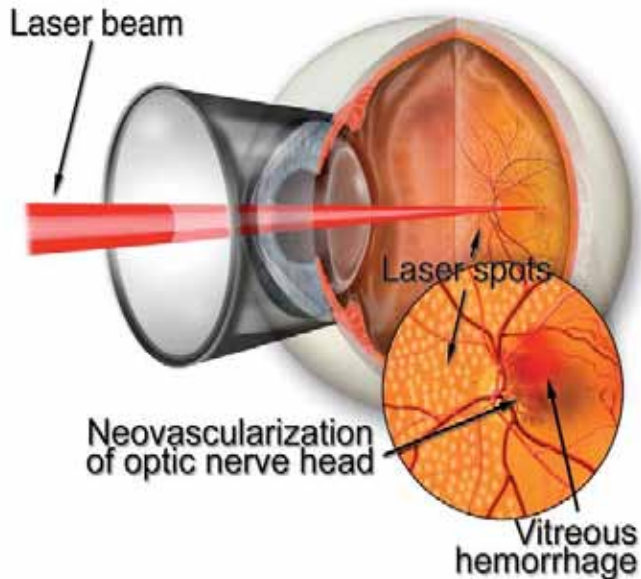
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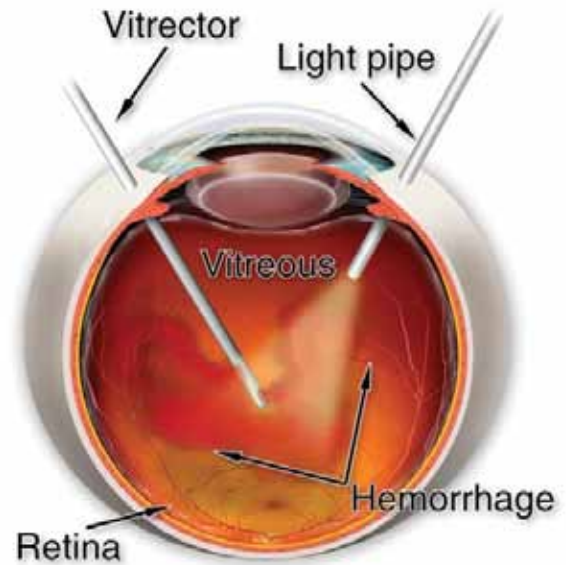
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Treatment: Proliferative Diabetic Retinopathy

Laser treatment for proliferative diabetic retinopathy



Vitrectomy surgery to remove blood inside the eye



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Treatment: Proliferative Diabetic Retinopathy

Proliferative diabetic retinopathy is treated with both laser and operating room surgery. The hallmark of proliferative diabetic retinopathy is retinal neovascularization, or abnormal “new” blood vessels growing on the retina. These blood vessels may bleed spontaneously and can cause serious scarring of the retina.

Laser Treatment: Pan-retinal photocoagulation (PRP) is a laser technique that stimulates shrinkage of these abnormal vessels. This procedure is performed in the office under topical or local anesthesia. Pan-retinal photocoagulation has been proven to reduce the risk of vision loss due to proliferative diabetic retinopathy.

Vitrectomy Surgery: If extensive new blood vessel growth, scar tissue formation, or bleeding inside the eye occurs, a surgical procedure known as a vitrectomy may be recommended. This surgery is performed in an operating room at a hospital or ambulatory surgery center. During a vitrectomy for proliferative diabetic retinopathy, blood inside the eye is removed and replaced with a clear fluid. Scar tissue is also removed from the retinal surface with delicate instruments. A vitrectomy surgery is often combined with laser treatment and/or retinal detachment surgery.

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