Diabetes is a systemic condition that is characterized by the inability of the body to utilize sugar; either because the body does not produce enough insulin (a necessary hormone for the metabolism of sugar) or cells can no longer use insulin. If blood sugar levels are elevated for a prolonged period of time, corrosion of the blood vessels can occur. Since blood vessels within the eye are very tiny, they are highly susceptible, and can be easily damaged by high blood sugar levels.

The earliest stages of diabetic retinopathy (when the blood vessels start to get damaged from high blood sugar levels) are not visible on examination. As the disease progresses, signs of diabetic retinopathy become more apparent. There are two main types of diabetic retinopathy; non-proliferative diabetic retinopathy and proliferative diabetic retinopathy.

Proliferative diabetic retinopathy occurs in only a small percentage of patients with diabetes (both type I and type II). Recent studies have shown that only around 16% of patients who have had diabetes for over 15 years show proliferative diabetic retinopathy changes on exam. Though proliferative diabetic retinopathy only accounts for a small percentage of cases, it is responsible for a majority of blindness caused by diabetes. Proliferative diabetic retinopathy is characterized by a growth of abnormal blood vessels within the retina as a result of ischemia (lack of oxygen). These abnormal blood vessels can leak profusely, causing serious damage to the retina and hemorrhaging into the vitreous.
What are the risk factors?
Diabetic retinopathy typically affects people who have had diabetes for a long period of time (15+ years). However, around 2% of people who have had Type II diabetes for only 5 years show signs of proliferative diabetic retinopathy. Factors shown in studies to be correlated with the formation of diabetic retinopathy include:

1. Long-standing diabetes
2. Consistently high blood sugar levels
3. High blood pressure
4. High lipids
5. Smoking

What are the symptoms?
Common symptoms of diabetic retinopathy include:

1. Decreased vision
2. Blurry vision
3. Distorted vision
4. Large finger-shaped or cobweb-like floaters
5. Colors don’t look as bright or vivid

What other problems can arise from proliferative diabetic retinopathy?
Proliferative diabetic retinopathy is an aggressive disease and can cause serious problems. The most common complication in proliferative diabetic retinopathy is a vitreous hemorrhage. Other complications include tractional retinal detachment, epiretinal membranes and the growth of abnormal blood vessels on the iris. Studies have shown that patients with proliferative diabetic retinopathy are at an increased risk for strokes.

How can the doctor determine the extent of diabetic retinopathy?
The doctor will perform a dilated exam with a slit lamp to determine the extent of the diabetic retinopathy and how much of the macula has been affected. To check for retinopathy of the outer retina, the doctor will use an indirect ophthalmoscope. Since retinal edema and swelling occurs in many cases of non-proliferative diabetic retinopathy, the doctor may order several tests to be performed.

What tests are performed?
Testing is important because it helps the doctor to precisely document the extent of retinopathy, check swelling within the retina, and measure changes that occur. The three types of tests described below are performed in our clinic.

Optical Coherence Tomography (OCT) is a high definition image of the retina taken by a scanning ophthalmoscope with a resolution of 5 microns. These images can determine the presence of swelling by measuring the thickness of the retina. The doctor will use OCT images to objectively document the progress of the disease throughout the course of your treatment.

Fundus Photography is an image taken by a digital fundus camera to document the vein occlusion in the retina.

Fluorescein Angiography is a test that documents blood circulation in the retina using fluorescein dye which luminesces under blue light. Fluorescein is injected into a vein in your arm and digital fundus pictures are taken afterwards for 10 minutes. The pictures are used to detect the presence of abnormal blood vessels and whether active leakage is occurring. The doctor will explain the pictures to you in more detail.

What treatments are available for proliferative diabetic retinopathy?
Studies have shown that over 50% of proliferative diabetic retinopathy cases left untreated lead to blindness, where as only 5% of treated cases lead to blindness. Return visits with us are recommended to monitor your disease progress. It is important to detect changes in your condition and formulate treatment plans as needed. The type of treatment necessary depends on the extent of the proliferation of abnormal blood vessels.

Intravitreal injection of Avastin, Lucentis and corticosteroids are used to prevent blood vessels from leaking and to decrease the amount of swelling within the retina.

Pan Retinal Photocoagulation (PRP) therapy is used when large amounts of leakage is occurring or if there is a large proliferation of abnormal vessels. The laser is used to destroy areas of the peripheral retina in-order to decrease the amount of oxygen needed by the retina, there-by decreasing ischemia. By destroying parts of the outer retina, more oxygen is able to be used by the macula.

Vitrectomy surgery is necessary if a vitreous hemorrhage or tractional retinal detachment forms.