Non-Proliferative Diabetic Retinopathy (NPDR)

What is non-proliferative diabetic retinopathy?
Diabetes is a systemic condition that is characterized by the in-ability 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.

Non-proliferative diabetic retinopathy occurs in a large majority of diabetic patients (both type I and type II). Recent studies have shown that 85% of patients who have had diabetes for over 15 years show non-proliferative diabetic retinopathy changes on exam. Non-proliferative diabetic retinopathy is characterized by microaneurisms within the retina and small areas of hemorrhaging (bleeding) within the retina. Since the blood vessels have been damaged from high blood sugar levels, fluid can leak into the retina, causing edema and swelling of the retina.
What are the risk factors?
Diabetic retinopathy typically affects people who have had diabetes for a long period of time (15+ years). However, 35% of people who have had type II diabetes for 5 years show signs of non-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?
In the early stages of non-proliferative diabetic retinopathy, patients may not experience any symptoms. As the disease progresses, patients usually experience one or more of the following symptoms:
1. Decreased vision
2. Blurry vision
3. Distorted vision
4. Floaters
5. Colors don’t look as bright or vivid

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 illuminates 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 determine the extent of retinal swelling, whether active leakage is occurring and where the leakage is originating from. The doctor will explain the pictures to you in more detail.

What treatments are available for non-proliferative diabetic retinopathy?
The American Diabetes Association suggests that diabetic patients should receive regular eye exams. 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. If no edema and swelling are present, only observation is required. If edema and swelling are present, treatment is necessary. There are two types of treatments available for retinal edema associated with non-proliferative diabetic retinopathy.

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.

Focal laser therapy is used when intravitreal injections are not effective or if leaking occurs close to the fovea (area responsible for central vision). The laser places small burns in the area of the retina that is leaking to help seal the vessels. If the leakage persists, several treatments may be necessary.