

## **Diabetic Eye Disease:**

Diabetic eye disease refers to a group of eye problems that people with diabetes may face as a complication of their disease. All of them can cause severe vision loss or even blindness. These diabetic eye diseases point to the importance of diabetic patients having an annual eye exam as part of their health plan.

## **Diabetic Retinopathy:**

Diabetic retinopathy is the most common eye disease associated with diabetes. This disease is the leading cause of blindness in American adults. It is caused by changes in the blood vessels of the retina. In some people with diabetic retinopathy, retinal blood vessels may swell and leak fluid. In other people, abnormal new blood vessels grow on the surface of the retina. These changes may result in vision loss or blindness.

The longer someone has diabetes, the more likely they will develop diabetic retinopathy. Nearly half of all people with diabetes will develop some degree of diabetic retinopathy during their lifetime.

### *Symptoms:*

Often, in the early stages of the disease, there are no symptoms. Vision may not change until the disease becomes severe. This is no pain.

Blurred vision may occur when the macula (the part of the retina that provides sharp, central vision) swells from leaking fluid. This condition is called macular edema. If new vessels have grown on the surface of the retina, they can bleed into the eye, blocking vision. But, even in more advanced cases, the disease may progress a long way without symptoms. That is why regular (annual) eye examinations for people with diabetes are so important!

### *Treatment:*

Your ophthalmologist may suggest laser surgery in which a strong light beam is aimed onto the retina to shrink the abnormal vessels. Laser surgery has been proven to reduce the risk of severe vision loss from this type of diabetic retinopathy by 60%.

If you have macular edema, laser surgery may also be used. In this case, the laser beam is used to seal the leaking blood vessels. However, laser surgery often cannot restore vision that has already been lost. This is why diagnosing diabetic retinopathy early is the best way to prevent vision loss.

### *Prevention:*

The Diabetes Control and Complications Trial (DCCT) showed that better control of blood sugar level slows the onset and progression of retinopathy and lessens the need for laser surgery for severe retinopathy.

The study found that the group that tried to keep their blood sugar levels as close to normal as possible

had much less eye, kidney, and nerve disease. This level of blood sugar control may not be best for everyone, including some elderly patients, children under 13, or people with heart disease. So ask your doctor if this program is right for you.

*Other Diabetic Eye Disease:*

If you have diabetes, you are also at risk for other diabetic eye diseases. Studies show that you are twice as likely to get a cataract as a person who does not have the disease. Also, cataracts develop at an earlier age in people with diabetes. Cataracts can usually be treated by surgery.

Glaucoma may also become a problem. A person with diabetes is nearly twice as likely to get glaucoma as other adults. And, as with diabetic retinopathy, the longer you have diabetes, the greater your risk of getting glaucoma. Glaucoma may be treated with medications, laser or other forms of surgery. (read more about Glaucoma in that section)

**Diabetic Retinopathy:**

Diabetic retinopathy is a potentially blinding complication of diabetes that damages the eye's retina. It affects nearly half of all Americans diagnosed with diabetes.

At first, you may notice no changes in your vision. But don't let diabetic retinopathy fool you. It could get worse over the years and threaten your vision! With timely treatment, 90% of those with advanced diabetic retinopathy can be saved from going blind.

The National Eye Institute (NEI) is the federal government's lead agency for vision research. The NEI urges all people with diabetes to have an eye examination through dilated pupils at least once a year.

Diabetic retinopathy occurs when diabetes damages the tiny blood vessels in the retina. At this point, most people do not notice any changes in their vision.

The retina is a light-sensitive tissue at the back of the eye. When light enters the eye, the retina changes the light into nerve signals. The retina then sends these signals along the optic nerve to the brain. Without a retina, the eye cannot communicate with the brain, making vision impossible.

Some people develop a condition called macular edema. It occurs when the damaged blood vessels leak fluid and lipids onto the macula (the part of the retina that lets us see detail). The fluid makes the macula swell, blurring vision.

As the disease progresses, it enters its advanced, or proliferative, stage. Fragile, new blood vessels grow along the retina and in the clear, gel-like vitreous that fills the inside of the eye. Without timely treatment, these new blood vessels can bleed, cloud vision, and destroy the retina.

All people with diabetes are at risk, including those with Type I diabetes (juvenile onset) and those with Type II diabetes (adult onset). During pregnancy, diabetic retinopathy may also be a problem for women with diabetes. It is recommended that all pregnant women with diabetes have dilated eye examinations each trimester to protect their vision.

Diabetic retinopathy often has no early warning signs. At some point, though, you may have macular edema. It blurs vision, making it hard to do things like read and drive. In some cases, your vision will get better or worse during the day.

As new blood vessels form at the back of the eye, they can bleed (hemorrhage) and blur vision. The first time this happens it may not be very severe. In most cases, it will leave just a few specks of blood, or spots, floating in your vision. They often go away after a few hours.

These spots are often followed within a few days or weeks by a much greater leakage of blood. The blood will blur your vision. In extreme cases, a person will only be able to tell light from dark in that eye. It may take the blood anywhere from a few days to months or even years to clear from the inside of your eye. In some cases, the blood will not clear. You should be aware that the large hemorrhages tend to happen more than once, often during sleep.

Diabetic retinopathy is detected during an eye examination that includes:

*Visual Acuity Test:*

This eye chart test measures how well you see at various distances.

*Pupil Dilation:*

The eye doctor places drops into the eye to widen the pupil. This allows them to see more of the retina and look for signs of diabetic retinopathy. After the examination, close-up vision may remain blurred for several hours.

*Ophthalmoscopy:*

This is an examination of the retina in which the eye care professional looks through a device with a special magnifying lens that provides a narrow view of the retina. The doctor may also wear a headset with a bright light, and look through a special magnifying glass to gain a wide view of the retina.

*Tonometry:*

This is a standard test that determines the fluid pressure inside the eye. Elevated pressure is a possible sign of glaucoma, another common eye problem in people with diabetes.

Your doctor will look at your retina for early signs of the disease, such as: leaking blood vessels; retinal swelling (such as macular edema); pale, fatty deposits on the retina (signs of leaking blood vessels); damaged nerve tissue; and any changes in the blood vessels.

Should your doctor suspect that you need treatment for macular edema, they may ask you to have a test called fluorescein angiography. In this test, a special dye is injected into your arm. Pictures are then taken as the dye passes through the blood vessels in the retina. This test allows your doctor to find the leaking blood vessels.

There are two treatments for diabetic retinopathy. They are very effective in reducing vision loss from this disease. In fact, even people with advanced retinopathy have a 90% chance of keeping their vision when they get treatment before the retina is severely damaged.

#### *Laser Surgery:*

Laser surgery is performed in the doctor's office. Before the surgery, your ophthalmologist will dilate your pupil, and apply drops to numb the eye. In some cases, the doctor may also numb the area behind the eye to prevent any discomfort.

The lights in the office will be dim. As you sit facing the laser machine, your doctor will hold a special lens to your eye. During the procedure, you may see flashes of light. These flashes may eventually create a stinging sensation that makes you feel a little uncomfortable.

You may leave the office once the treatment is finished, but you will need someone to drive you home. Because your pupils will remain dilated for a few hours, you also should bring a pair of sunglasses.

For the rest of the day, your vision will probably be a little blurry. If your eye hurts a bit, your doctor can suggest a way to control this.

Laser surgery is often used to treat macular edema and proliferative retinopathy.

#### *For Macular Edema:*

Timely laser surgery can reduce vision loss from macular edema by half. But you may need to have laser surgery more than once to control the leaking fluid.

During the surgery, the doctor will aim a high-energy beam of light directly onto the damaged blood vessels. This is called focal laser treatment. This seals the vessels and stops them from leaking.

#### *For Proliferative Retinopathy:*

In treating advanced diabetic retinopathy, doctors use the laser to destroy the abnormal blood vessels that form in the back of the eye.

Rather than focus the light on a single spot, your doctor will make hundreds of small laser burns away from the center of the retina. This is called scatter laser treatment. The treatment shrinks the abnormal blood vessels. You will lose some of your side vision after this surgery to save the rest of your sight. Laser surgery may also slightly reduce your color and night vision.

Once you have proliferative retinopathy, you will always be at risk for new bleeding. This means you may need treatment more than once to protect your sight.

*Vitrectomy:*

Instead of laser surgery, you may need an eye operation called a vitrectomy to restore your vision. A vitrectomy is performed if you have a lot of blood in the vitreous. It involves removing the cloudy vitreous and replacing it with a salt solution. Because the vitreous is mostly water, you will notice no change between the salt solution and normal vitreous.

Studies show that people who have a vitrectomy soon after a large hemorrhage are more likely to protect their vision than someone who waits to have the operation. Early vitrectomy is especially effective in people with insulin dependent diabetes, who may be at greater risk of blindness from a hemorrhage into the eye.

Vitrectomy is done under local anesthesia. This means that you will be awake during the operation. The doctor makes a tiny incision in the sclera, or white of the eye. Next, a small instrument is placed into the eye. It removes the vitreous and inserts the salt solution into the eye.

You may be able to return home soon after the vitrectomy; or, you may be asked to stay overnight. Your eye will be red and sensitive. After the operation, you will need to wear an eyepatch for a few days or weeks to protect the eye. You will also need medicated eye drops to protect against infection.