

Diabetic Retinopathy

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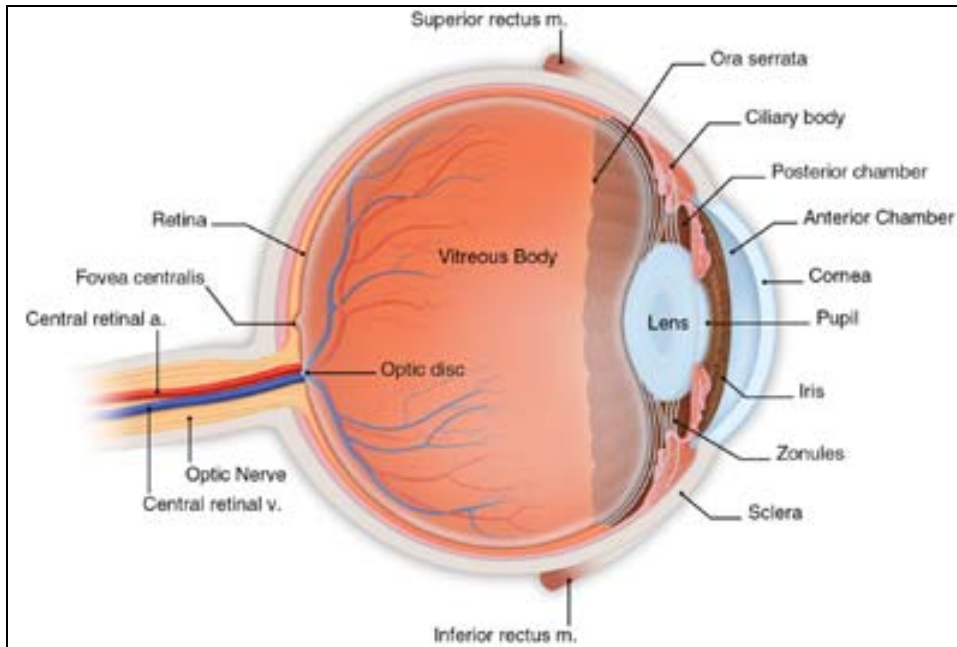
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Overview

Diabetic Retinopathy is a complication of Diabetes. High blood sugar levels damage the capillaries, or tiny blood vessels, that supply blood to the retina. The disease is usually diagnosed as early “Nonproliferative” Diabetic Retinopathy or the more advanced “Proliferative” Diabetic Retinopathy.

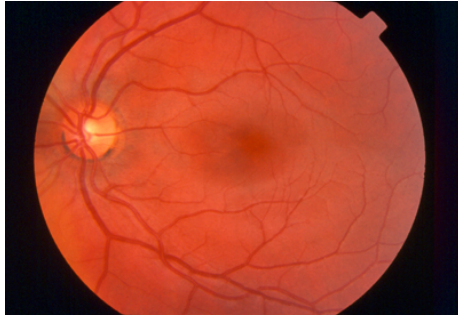


"The eyeball is very similar to a camera. The colored part of the eye is the iris. The pupil (the opening in the center of the iris) enlarges in the dark and shrinks in the light. This process works just like the diaphragm of a camera to control the amount of light that gets into the eye. The lens of the eyeball camera sits behind the iris. The back of the eye is lined by a thin tissue called the retina. Like film in the camera, this layer captures the light to create an image which is then sent to the brain through the optic nerve. The eye ball globe is filled with a jelly-like substance called the vitreous. This gel is firm when we are young and more watery as we age.

The retina is composed of millions of living cells fed by arteries which bring in fresh oxygen and other nutrients. Tiny capillaries (small blood vessels) connect the arteries to the veins to deliver the nutrients to the actual cells and take away the deoxygenated blood.

Types of Diabetic Retinopathy

“Background” or “Nonproliferative” Diabetic Retinopathy



Normal Retina



Retina with Nonproliferative
Diabetic Retinopathy

The most common form of Diabetic Retinopathy is called “background” or “non-proliferative” disease. It is seen most often in patients who develop Type 2 or adult-onset diabetes.

In this form of the disease, high blood sugar levels cause weak spots in the walls of the tiny blood vessels that supply blood to the retina. These thin walled sacs break and bleed creating tiny hemorrhages. They also leak fluid creating swelling in the surrounding retinal cells. The higher your blood pressure, the more pressure there is to push fluid out of the leaky vessels. This might blur your vision. Visual blurring caused by nonproliferative retinopathy can't be corrected with glasses and long-term swelling can permanently reduce your central vision.

“Proliferative” Diabetic Retinopathy



Proliferative Diabetic Retinopathy - abnormal blood vessels in the retina

Proliferative retinopathy can occur in any diabetic but is most common in diabetics who develop the disease as children (known as “Type 1” or “juvenile onset diabetics”). It can occur alone or at the same time as non-proliferative disease.

In this advanced stage of the disease, the retina triggers the growth of abnormal blood vessels that grow into the vitreous gel in the center of the eye. Over time, the blood vessels contract forming fibrous bands that can tear the retina off the back of the eye.

As the blood vessels within the bands contract, they may bleed filling the vitreous gel with blood. A hemorrhage of this type can rapidly reduce vision and may take weeks or months to clear. Additionally, the fibrous bands may continue to contract pulling the retina off the back of the eye. A retinal detachment of this type can severely affect the central vision. Retinal tears of this type often cannot be fixed with surgery.

Symptoms

Most of the time, there are no symptoms until the disease starts to change your vision. When this happens, Diabetic Retinopathy is usually already severe. Changes in vision can be a sign of severe damage to your eye. Changes can include:

- Seeing “floaters,” “cobwebs,” or “spots” in your field of vision
- Blurry vision
- Sudden vision loss

Screening and Diagnosis

- At your eye exam, be sure to tell us that you are diabetic. We will look for [Diabetic Retinopathy](#) during your exam
- If you have diabetes you should be screened regularly for the presence of Diabetic Retinopathy to ensure that the disease is diagnosed early, when it is still treatable.
- The disease can make significant progress before you notice any symptoms. Once vision changes occur, additional loss can be both rapid and irreversible.

Dilating your pupil

Most Kaiser Permanente facilities offer photographic screening for diabetic patients without other eye related symptoms or concerns. Before taking photographs of the retina, we use eye drops to dilate the pupil.

- The drops take 30 minutes to work and your vision will be affected for a few hours afterwards. However we highly recommend dilation because it allows us to get a clear image of the back of the eye.
- We recommend bringing someone with you who can drive you home after your test. If this will be a problem for you, let our staff know.
- We are occasionally able to obtain a readable photo without the inconvenience of dilation and we can try to determine if we can do that in your case.

Causes and Risks

- Diabetic Retinopathy is caused by elevated blood sugar levels. Too much sugar in your blood damages the tiny blood vessels (capillaries) that supply the retina. This results in Diabetic Retinopathy.
- Other factors that may increase your risk of developing Diabetic Retinopathy include high blood pressure, pregnancy, a family history of the condition, kidney disease, high cholesterol, and a history of smoking.

Prevention

You can help prevent or slow the progression of [Diabetic Retinopathy](#). Even if you have vision loss, it is important for you to be an active participant in your daily diabetes care. The following key points can help you maintain an active and healthy lifestyle

Control your blood sugar levels

- If you can keep your blood sugar (your fasting blood sugar and your Hemoglobin A1C) in the normal range you will probably be able to maintain good vision throughout your life.
- Keep blood sugar levels [near normal](#) by eating a diet that spreads carbohydrate intake throughout the day.
- Monitor your blood sugar levels frequently.
- Get regular physical exercise.
- Take your diabetic medications as prescribed.

Have your eyes examined regularly

- Screening for Diabetic Retinopathy and other eye problems will not prevent diabetic eye disease, but it can help you avoid vision loss by allowing for early detection and treatment.
- We recommend that you get screened every two years if your last exam was free of retinopathy and within one year if there are signs of mild disease. More severe disease will require more frequent monitoring.
- Changes in vision—such as [floaters](#), blurry vision, or new vision loss—may be symptoms of serious damage to your [retina](#). In most cases, the sooner the problem can be treated, the more effective the treatment will be.

Treatment

Control of Blood Sugars

The best treatment for diabetic disease is the maintenance of excellent blood sugars and blood pressure control. If you already have Diabetic Retinopathy, establishing good blood sugar control will help to stabilize your vision loss and in some cases can improve vision.

Related Health Tool

[Hemoglobin A1c](#)

Laser Treatment

If the Nonproliferative disease is severe enough to risk affecting your vision, it can be treated with a low power laser. This procedure can stop the abnormal leakage of blood and fluid in your eye. The purpose of the procedure is to maintain your current level of vision rather than to improve it. These treatments usually take about 10-20 minutes and may be a little uncomfortable. Some additional diagnostic tests, including a [fluorescein angiogram](#), may be performed prior to this treatment.

Photocoagulation

If you have the more severe Proliferative disease, this may be treated with panretinal photocoagulation, a procedure performed with a laser. The laser intentionally destroys the peripheral unhealthy tissue that is stimulating abnormal blood vessel growth. The procedure helps to preserve and protect your central vision – the vision that allows you to continue to both read and drive. After the procedure your vision will be blurry for about a day. Some loss of peripheral or night vision may occur.

Vitrectomy

If you have blood in the vitreous gel or if there traction on the retina, a vitrectomy may be performed to surgically remove the vitreous gel from the center of your eye. In this procedure, the surgeon cuts and removes any fibrous bands that may be pulling the retina out of its normal position. Additionally, abnormal blood trapped in the vitreous gel is removed. This procedure alleviates traction on your retina caused by fibrous bands that are found in proliferative disease. This procedure is performed by skilled retina/vitreous surgeons and is reserved for patients who are experiencing or at risk for severe vision loss.

Why Treatment is Important

- It is important to control blood sugars as soon as possible and obtain laser treatment in a timely fashion to stabilize vision before too much is lost.
- The longer swelling of the retina (retinal edema) is allowed to persist, the greater the chance of vision loss.
- Proliferative disease, if left untreated can lead to blindness and even loss of the eye.

Living with Diabetic Retinopathy

Glasses

Your blood sugar levels profoundly affect your vision. Make sure that your blood sugars are in their typical range on the day you are measured for your glasses. If your sugars are not in your usual range, we recommend that you reschedule your Optometry appointment to insure that you receive the best possible pair of glasses.

Your blood sugar levels fluctuate over the course of the day. Some very sensitive diabetics experience fluctuations in the sharpness of their vision during these changes even with the best pair of glasses.

Your eye's lenses tend to enlarge when your blood sugar levels are elevated. If you have just started treatment to reduce your blood sugars, you may notice your vision blurring as your blood sugars drop. As the lenses return to their normal shape, you may need a new prescription for glasses that are powered to match your lenses' new shape.

Even if your blood sugars are well controlled, a minor illness like a cold or the flu can cause your blood sugars to go out of control for a few days. During these periods you may experience more blurred vision. When you recover from the illness, your blood sugars and your vision should return to their previous levels.

Vision Loss

It is important to find ways to adapt so that you can use your remaining eyesight to its greatest potential and identify the kinds of [vision aids](#) that are most helpful for you.

- If your [visual acuity](#) is 20/70 or worse with glasses or contact lenses we can provide a [low-vision evaluation](#) to help you use your remaining vision.
- Obtain a copy of “Coping with Sight Loss in Northern California” by the non-profit organization Prevent Blindness.
- Make adjustments in your daily activities. You can continue to do most—if not all—of your daily diabetes care and other activities even though your eyesight is not good and may fluctuate. Use felt-tip markers to label your medicines and diabetic supplies.
- Acquire vision aids if Diabetic Retinopathy has severely damaged your vision. We have resources in our Health Education Department and Prevent Blindness can help you as well.
- Some of our Optical shops offer low vision aides. Low vision aids are magnifiers designed to assist you in performing specific visual tasks. Ask us to schedule a low vision evaluation if you would like assistance in selecting one or more low vision aides.
- Additional resources for patients with low vision can be found in our Health Education Department and with the organization Prevent Blindness Northern California.

Additional Reference

[Prevent Blindness](#) in Northern California.

Getting your Care at Kaiser Permanente

We offer diabetic photographic screening. Before taking photographs of the retina, we use eye drops to dilate the pupil. Some patients prefer to avoid dilation because the drops take 30 minutes to work and vision is affected afterwards. However we highly recommend dilation because it allows us to get a clear image of the back of the eye. Dilation is not painful. However, dilation usually impairs your vision for several hours so we recommend bringing someone with you who can drive you home.

Since excellent blood sugars and blood pressure control are the key to preventing and treating diabetic eye disease, we want to provide any assistance we can to help you achieve the best control possible. Please let us know if you wish to participate in any of the many Health Education classes Kaiser Permanente offers on diabetes self care, weight loss, nutrition, blood pressure control or blood sugars control.