

# Diabetic retinopathy

Diabetic retinopathy is an eye condition that causes changes to the blood vessels in the part of your eye called the retina. That's the lining at the back of your eye that changes light into images. The blood vessels can swell, leak fluid, or bleed, which often leads to vision changes or blindness. It usually affects both eyes. When left untreated, diabetic retinopathy can scar and damage your retina.

Diabetic retinopathy is the most common cause of vision loss for people with diabetes. It's the leading cause of blindness for all adults in the U.S.

## Symptoms



You might not have any signs of diabetic retinopathy until it becomes serious. When you do have symptoms, you might notice:

- Loss of central vision, which is used when you read or drive
- Not being able to see colours
- Blurry vision
- Holes or black spots in your vision
- Floaters, or small spots in your vision caused by bleeding

## Causes

If your blood glucose level (blood sugar) is too high for too long, it blocks off the small blood vessels that keep your retina healthy. Your eye will try to grow new blood vessels, but they won't develop well. The blood vessels start to weaken. They can leak blood and fluid into your retina. This can cause another condition called macular edema. It can make your vision blurry.

As your condition gets worse, more blood vessels become blocked. Scar tissue builds up because of the new blood vessels your eye has grown. This extra pressure can cause your retina to tear or detach. This can also lead to eye conditions like glaucoma or cataracts (the clouding of your eye's lens) that may result in blindness.

## Risks

If you have any form of diabetes -- type 1, type 2, or gestational -- you may get diabetic retinopathy. Your chance goes up the longer you have diabetes. Almost half of Americans diagnosed with diabetes have some stage of diabetic retinopathy. And only about half of them know they have this disease.

Other things that can raise your odds of diabetic retinopathy include:

- High blood pressure
- High cholesterol
- Tobacco use
- Being African American, Hispanic, or Native American

## Stages

Diabetic retinopathy tends to go through these four stages:

1. **Mild nonproliferative retinopathy.** In the disease's earliest stage, tiny blood vessels in your retina change. Small areas swell. These are called microaneurysms. Fluid can leak out of them and into your retina.
2. **Moderate nonproliferative retinopathy.** As your disease gets worse, blood vessels that should keep your retina healthy swell and change shape. They can't deliver blood to your retina. This can change the way your retina looks. These blood vessel changes can trigger diabetic macular edema (DME). That's swelling in the area of your retina called the macula.
3. **Severe nonproliferative retinopathy.** In the third stage, many blood vessels get blocked. They can't deliver blood to your retina to keep it healthy. Areas of your retina where this happens make special proteins called growth factors that tell your retina to grow new blood vessels.
4. **Proliferative diabetic retinopathy (PDR).** This is the most advanced stage. New blood vessels grow inside your retina and then into the jelly inside your eyeballs called vitreous humor. Fragile new blood vessels are more likely to

leak fluid and bleed. Scar tissue starts to form. This can cause retinal detachment, when your retina pulls away from the tissue underneath. This can lead to permanent blindness.

## Diagnosis

Your eye doctor can usually tell if you have diabetic retinopathy during your eye exam.

- **Pupil dilation.** Your doctor will dilate your pupils to look for any changes in your eye's blood vessels or see if any new ones have grown. They'll also see if your retina is swollen or detached.
- **Fluorescein angiogram.** This test can tell your doctor if you have DME or severe diabetic retinopathy. It shows if any of your blood vessels are leaking or damaged. Your doctor will give you a shot with fluorescent dye into a vein in your arm. When the dye reaches your eyes, your doctor will be able to see images of the blood vessels in your retina and spot any serious problems.

## Treatment

Treatments for diabetic retinopathy include:

**Anti-VEGF injection therapy.** Drugs that block vascular endothelial growth factor (VEGF), a protein that makes abnormal blood vessels grow in your eye, can reverse the blood vessel growths and lower fluid build-up in your retina. Anti-VEGF drugs include aflibercept (Eylea), bevacizumab (Avastin), and ranibizumab (Lucentis).

**Focal/grid macular laser surgery.** Lasers make tiny burns on the leaky areas of vessels in your macula. You may need anti-VEGF therapy after this surgery.

**Corticosteroids.** Doctors can implant or inject these medications into your eye. There are both short-term and long-acting types. Steroids can raise your chance of glaucoma or cataracts. Your eye doctor will monitor the pressure in your eye if you take them.

**Scatter laser surgery.** This treatment makes up to 2,000 tiny burns to treat spots where your retina has detached from the macula. This can shrink abnormal blood vessels. You may need two or more sessions. Laser surgery can save your central vision, but it may lessen your side, colour, or night-time vision. It works best if you get it before those new vessels start to bleed.

**Vitreotomy.** If blood vessels leak into your retina and vitreous humor and your vision clouds, you may need to have this procedure. It removes the leaked blood so you can see better. This can treat cloudy vision.

Your doctor will tell you if any of these treatments are right for you. They'll do them in the doctor's office or in the hospital.

## Complications

Diabetic macular edema (DME) is a serious complication of diabetic retinopathy. A healthy macula gives you sharp vision straight in front of you. This is what you need to drive, read, and see other people's faces. If your diabetic retinopathy causes fluid build-up and swelling in your macula, you can get DME.

DME is the most common reason people with diabetic retinopathy lose their vision, and about half of people with diabetic retinopathy get DME. You're more likely to get DME at later stages of diabetic retinopathy, but it can happen at any point.

Sometimes, vision loss from DME can't be reversed.

## Prevention

Work with your doctor to keep your blood sugar and blood pressure at good levels. This will slow down diabetic retinopathy and maybe even stop it from happening.

Here are more tips to prevent diabetic retinopathy:

- Make sure you see an eye doctor at least once a year for a complete eye exam.
- If you have diabetes and are pregnant, have a thorough eye exam during your first trimester.
- Follow up with your eye doctor during pregnancy. Tell your eye doctor if you develop gestational diabetes.
- Don't smoke if you have diabetic retinopathy or diabetes.