



X-Plain *Diabetic Retinopathy* **Reference Summary**

Introduction

Patients with diabetes are more likely to have eye problems that can lead to blindness. Diabetic retinopathy is a disease of the eye's retina that is caused by diabetes.

If discovered early, diabetic retinopathy can be treated easily.

This reference summary explains what diabetic retinopathy is.

How the Eye Works

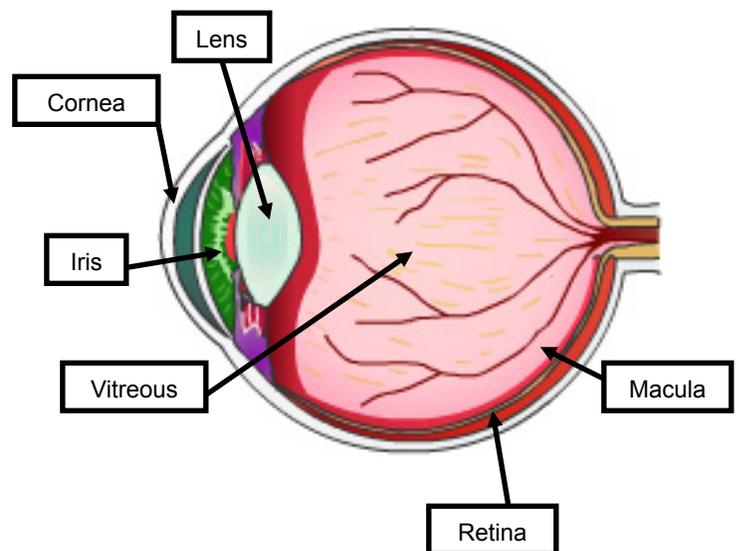
The following section describes how the eye works and diseases of the eye, such as diabetic retinopathy.

Light first hits the eye's cornea, which allows light to enter the eye through the iris. The iris controls the amount of light that enters the eye by changing the size of the pupil.

As light passes through the pupil, it enters a clear lens similar to the lens of a camera, which focuses the light onto the back of the eye. The focused light passes through a clear gel called "vitreous" until it reaches the back of the eye.

The back of the eye is called the retina. The retina changes light signals into electric signals that are sent to the brain through the optic nerve. The brain translates these signals into the images we see.

The middle part of the retina is called the "macula" and is responsible for sharp, central vision. The rest of the retina, known as the periphery, allows us to see things off to the side, above, and below us.



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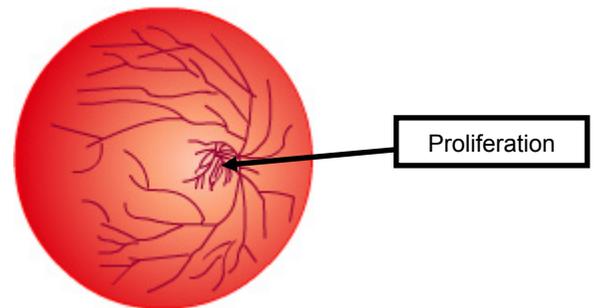
Like other parts of the body, the retina needs blood to function correctly. Blood flows to the retina through small blood vessels.

Diabetic Retinopathy

Diabetics are more likely to develop eye problems than non-diabetics are. Diabetes weakens the body's blood vessels. Since the blood vessels of the eyes are small, they can leak, burst, or become blocked when they are weak.

The weakening of the eyes' blood vessels is called diabetic retinopathy. Retinopathy means disease of the retina. It is a serious eye condition caused by diabetes. Weak blood vessels in the retina may leak, which sometimes causes the retina to swell. If swelling affects the center of the retina where vision is clearest, the condition is called diabetic macular edema. Severe diabetic macular edema can cause vision loss.

If blood vessels in the retina become clogged, poor circulation or death of parts of the retina may occur. The retina responds to this by trying to grow new blood vessels. When new blood vessels sprout, it is called "proliferation" of the blood vessels.



Abnormal blood vessel proliferations are not healthy and grow in the wrong places. Since these blood vessels are very weak, they can rupture and bleed easily, causing hemorrhaging in the eye.

When new, abnormal blood vessels begin to grow inside the eye where they should not grow, it is called "proliferative diabetic retinopathy." Before this stage, the disease is called "non-proliferative diabetic retinopathy."

Diabetic retinopathy begins as non-proliferative diabetic retinopathy. Non-proliferative diabetic retinopathy usually has no symptoms. However, when eye doctors look into the eyes of someone with non-proliferative retinopathy, they see certain signs.

Doctors may see small hemorrhages in the retina:

- microaneurysms , or dilated blood vessels
- cotton wool spots, which are areas of poor circulation
- exudates, which are fatty deposits indicating poor circulation and leakage

These non-proliferative changes can range from very mild to severe.

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When weak blood vessels of the retina rupture, the bleeding may only be in the retina or it may also be in the vitreous gel in front of the retina. Bleeding in the retina damages the retina and can also cause vision loss that prevents reading or driving. In some cases, vision loss can grow to the level of legal blindness.

Blood that leaks from the retina into the vitreous gel makes the gel cloudy and it's hard for light to reach the retina. This causes clouded and blurry vision. When new, weak blood vessels grow, they may also grow into the vitreous gel, which acts as a framework for the blood vessels to grow on.

Scar tissue often grows with new, weak blood vessels into the vitreous. The scar tissue can then shrink, causing the vitreous to pull on the retina. This pulling can make the retina detach leading to severe vision loss or even blindness.

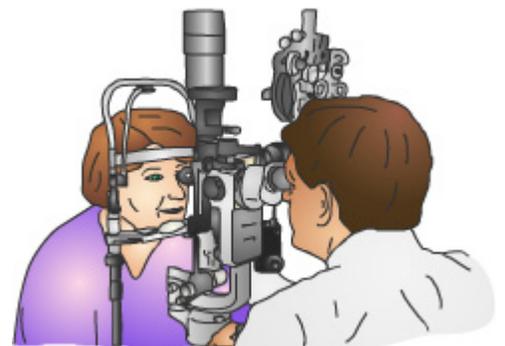
Even though most patients with diabetes eventually develop retinopathy, closely controlling diabetes, hypertension, and cholesterol slows down the development of retinopathy and makes it less severe.

Symptoms

People with mild diabetic retinopathy might not have any symptoms for years. On the other hand, people with severe diabetic retinopathy may start losing their vision or become blind.

Symptoms of diabetic retinopathy include:

- blurry vision
- missing areas of vision
- “floaters” in vision that look like cobwebs, strings, or clouds



Other eye conditions can cause the same symptoms as diabetic retinopathy. Only an eye exam will show what is causing these symptoms. Anyone with these symptoms should see an eye doctor as soon as possible, whether they have diabetes or not.

Diagnosis

There is no way for a person to check for retinopathy on his or her own. A doctor must examine the retina to look for signs of retinopathy.

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An eye exam allows the doctor to see if there are any areas where blood vessels have dilated, or become wider. These areas are called microaneurysms.



During an eye examination, the doctor can also check for fatty deposits, called exudates, or white patches, called cotton wool spots; both are signs of poor circulation. Exudates are also a sign of leaky blood vessels.

Finally, the doctor can find out if new, abnormal blood vessels (proliferations) have sprouted or if there is any swelling that may be threatening central vision.

Patients with mild retinopathy may be told to return for an eye examination only once per year. Those with more severe retinopathy may need to be examined more often. Those with proliferative retinopathy or macular edema usually need treatment.

Treatment

Depending on how severe it is, doctors keep a better watch on early stages of diabetic retinopathy. Good control of diabetes and blood pressure is the best way to slow down the development of retinopathy. Some patients with milder stages of retinopathy may even improve the retinopathy by more closely managing their diabetes, blood pressure, or cholesterol.

For patients who have proliferative retinopathy, the doctor may recommend surgery to slow down its development and possibly prevent more bleeding. The surgery is called laser photocoagulation. Laser photocoagulation is an outpatient office procedure.

During laser photocoagulation, the eye doctor makes tiny burns on the retina with a special laser. These burns help to dry up the blood vessels and stop them from growing and leaking. The pattern and intensity of laser burns depend on the type and severity of the retinopathy.

When a lot of blood has leaked into the vitreous, surgery to remove the vitreous is recommended. This surgery is called vitrectomy. When the retina has detached, vitrectomy surgery to reattach the retina may be recommended. Vitrectomy surgery is more complex than laser surgery and must be done in an operating room under sterile conditions.

The surgical options to treat severe diabetic retinopathy are more successful when diabetic retinopathy is diagnosed early.

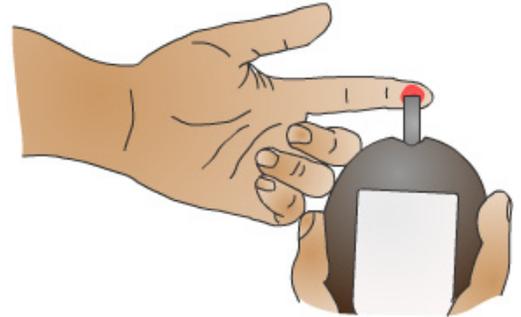
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Summary

Diabetic retinopathy is a serious disease that can cause blindness. The weakening of the eyes' blood vessels due to diabetes causes it.

The earlier retinopathy is detected, the lower the chances are that retinopathy will lead to major vision loss. Early detection makes it possible to diagnose retinopathy at early stages, when treatment is most effective.

The best treatment for retinopathy is prevention. Good control of blood sugar levels, cholesterol levels, and blood pressure can help to prevent or delay retinopathy. Healthy eating and exercise are also good preventatives for retinopathy. Your healthcare provider can refer you to additional resources about diabetes and diabetic retinopathy.



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