

DIABETIC RETINOPATHY

DIAGNOSIS AND MANAGEMENT

OCEANIA RETINA ASSOCIATION

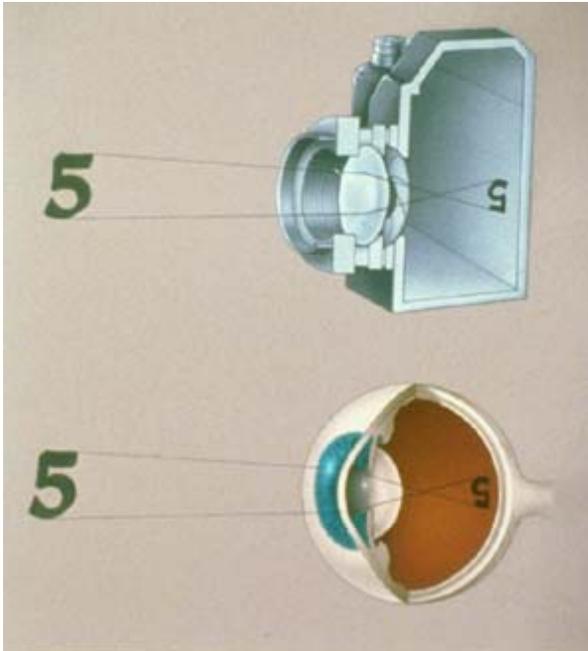
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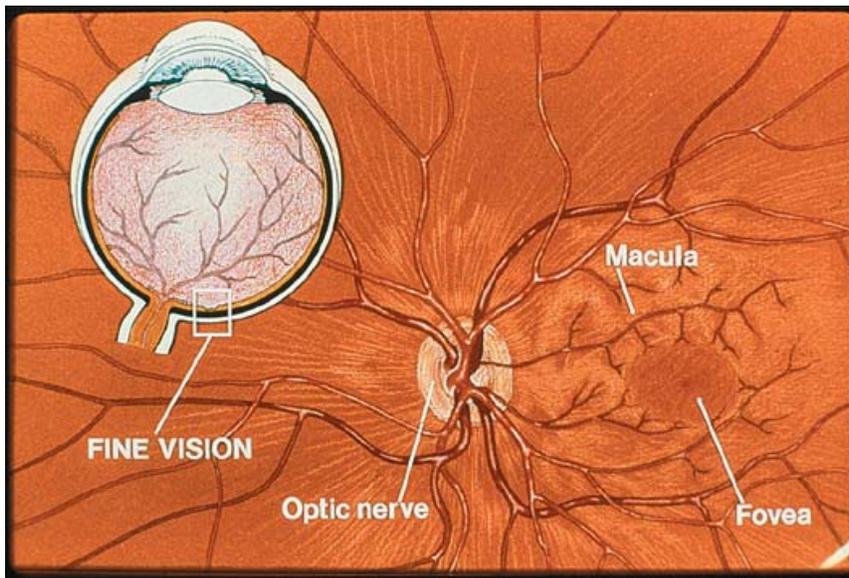
STRUCTURE AND FUNCTION OF THE EYE

The eye is similar to a camera. It has a clear lens focussing light to a light sensitive membrane (the retina) which creates nerve signals. These signals form the basis of vision and are sent to the brain via the optic nerves. The brain processes the signals and eyesight is perceived by the individual.

The retina is a thin transparent membrane spread over the inside of the back of the eye. It contains specialised cells called rods and cones and it is these cells that register the light. The cone cells are responsible for clear, straight ahead viewing and colour vision. The rod cells provide night and side vision. The retina is kept alive by blood vessels both within its structure and underneath it. The blood vessels are known as retinal arteries, capillaries and veins. Clearly anything that interferes with the function of the retina will have some impact on eyesight.



The most of the important part of the retina is where the cone cells are and this is called the macula. It represents the centre of vision.



DEFINITION AND CLASSIFICATION OF DIABETIC RETINOPATHY

In people with diabetes the capillaries in the retina are diseased and damaged. These damaged vessels either leak or become completely blocked. This is diabetic retinopathy and it has a number of effects that can lead to vision loss. It is a slow process taking months to years to have its effects.

Early diabetic retinopathy is called “non-proliferative diabetic retinopathy”. More advanced disease is called “proliferative diabetic retinopathy”. A common process seen in diabetes is called “diabetic macular oedema” where the macula swells.

RISK FACTORS FOR DIABETIC RETINOPATHY

The longer a person has had diabetes the greater the risk of diabetic retinopathy. About 80% of people who have diabetes for 15 years will have some retinopathy. However, about 13% of newly diagnosed adults will have retinopathy at the time of diagnosis.

The consistency of good control of sugar during diabetes also impacts on the development and severity of diabetic retinopathy.

High blood pressure, kidney failure and cholesterol can adversely affect the severity of diabetic retinopathy.

Pregnancy can sometimes result in a rapid acceleration of diabetic retinopathy.

For all these reasons, a newly diagnosed adult should have a full eye examination at the time of diagnosis and then one to two yearly thereafter. A child who develops diabetes need not be examined at diagnosis but should have an eye examination after 5 years of disease. An insulin dependent female planning pregnancy should have an eye examination at three months into pregnancy.

Smoking does accelerate the damage diabetes does to the retina. A person with diabetic retinopathy should not smoke. Nor should anyone else.

DIAGNOSIS OF DIABETIC RETINOPATHY

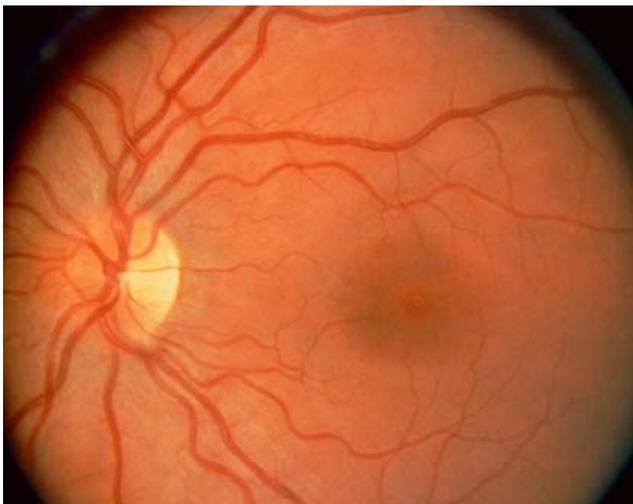
SYMPTOMS

Blurring of vision is the main symptom associated with diabetic retinopathy but this usually occurs when the disease is already well established. Many people with diabetic retinopathy will have no symptoms at all. Diabetic retinopathy does not cause pain. People with proliferative retinopathy may experience floating spots in their vision due to bleeding within the eye.

The doctor will take your full medical history including all other health problems, medications, allergies. Your vision will be measured.

SIGNS

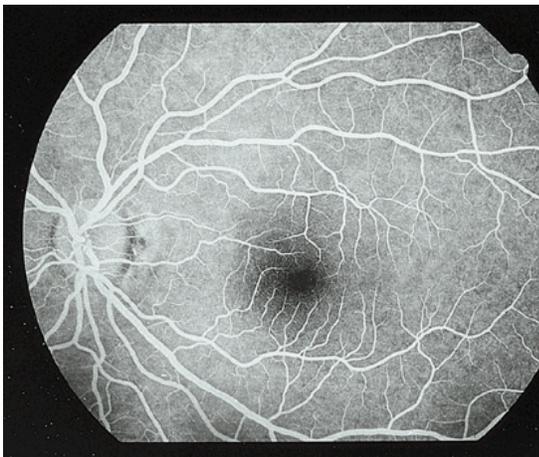
Your eye doctor will examine your eyes and should use drops to dilate or open the pupils. The doctor will be able to examine the retina in detail. A photo of a normal retina is seen below.



If the retina is diseased then the doctor may carry out a test known as fluorescein angiography. This is a photographic record of the state of the retinal blood vessels. A yellow dye is injected into an arm vein and photographs using a special camera are taken.

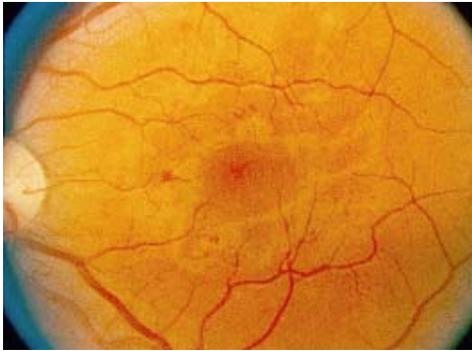


A normal photograph from a fluorescein angiogram is depicted below.

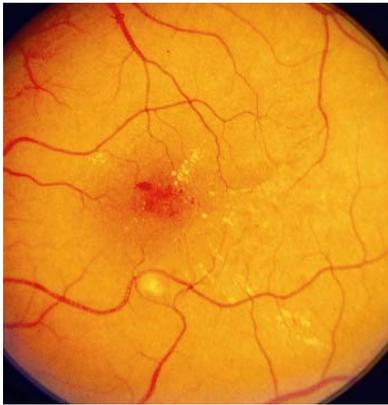


The eye examination and tests will enable the eye doctor to determine the extend and severity of diabetic retinopathy. Treatment recommendations can be made.

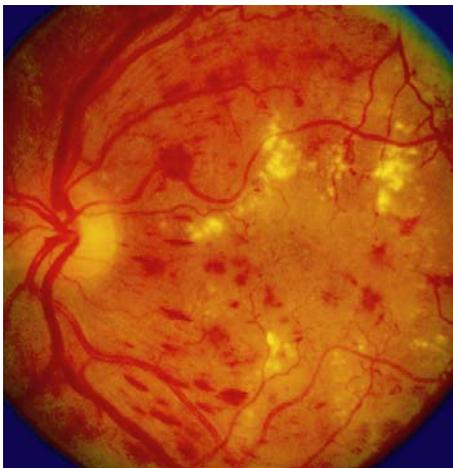
In early non-proliferative diabetic retinopathy, most people usually have no symptoms and there are small areas of leakage in the retina.



If diabetic macular oedema occurs, then laser treatment may be needed.



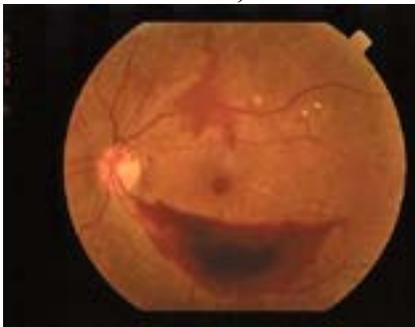
More established non-proliferative retinopathy may require careful monitoring or laser treatment.



In proliferative diabetic retinopathy, much of the retina is affected by obstruction of retinal capillaries. This may not necessarily affect vision directly but it does cause “new” capillaries to grow on the surface of the retina or optic nerve.



These new vessels are prone to bleeding and can fill the eye with blood, dramatically blurring vision. In addition, scar tissue can develop causing retinal detachment to occur.



kTime™ and a
D Decompressor
to use this picture

TREATMENT OF DIABETIC RETINOPATHY

Improvement of diabetic control, reduction of risk factors such as high blood pressure and cholesterol and regular eye examinations will all help toward reducing the impact of diabetic retinopathy on a person's eyesight.

The two treatments for diabetic retinopathy, once established, are:

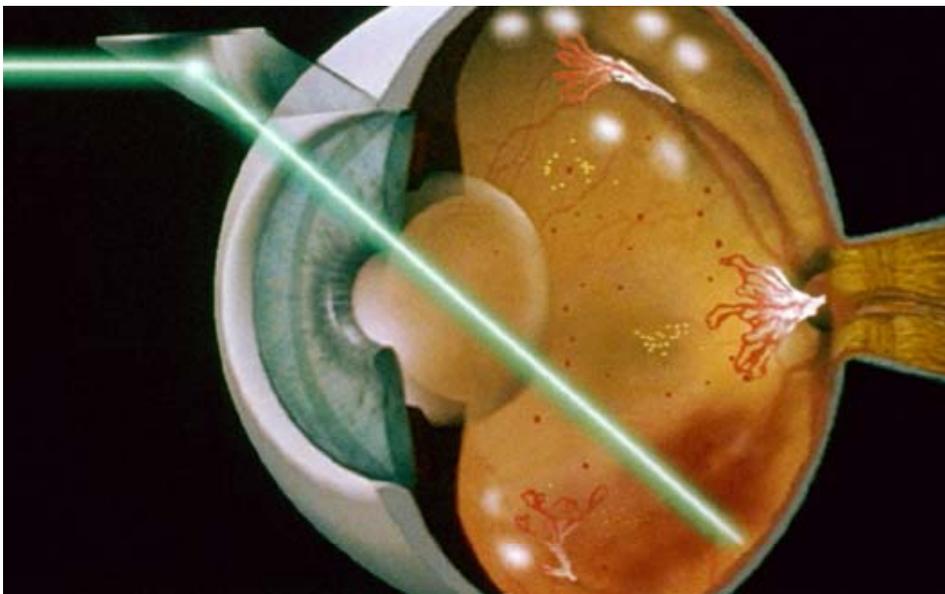
1. laser
2. vitrectomy surgery

Neither of these treatments cures retinopathy. The best that can be achieved usually is slowing or preventing further vision loss.

LASER TREATMENT FOR DIABETIC RETINOPATHY

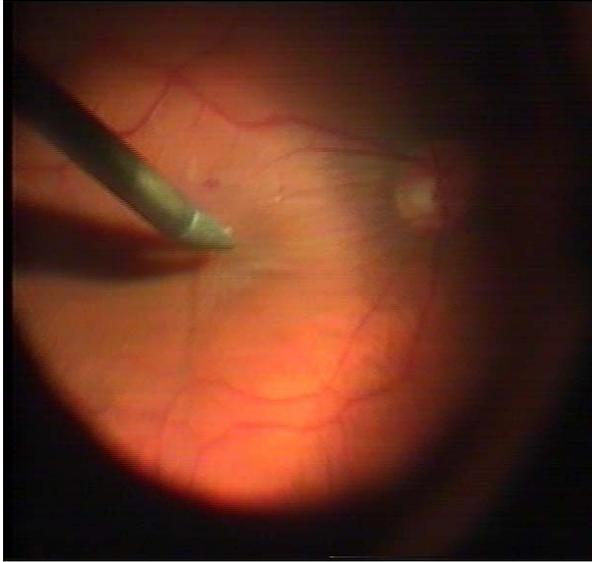
Laser treatment is usually indicated to control leakage from capillaries in diabetic macular oedema, or to shrink “new” vessels in proliferative diabetic retinopathy. In diabetic macular oedema, small applications of laser are used to “cauterise” the leaking vessels using thermal energy. In proliferative retinopathy, more intensive treatments to much of the retina are required to shrink the new vessels.

Laser treatment may be associated with discomfort or pain. Some treatments may require pain relieving medication or anaesthetic injections to numb the eye. Eyesight may fluctuate during a course of treatment.



SURGERY FOR RETINOPATHY

Vitreotomy surgery is required for advanced cases of proliferative diabetic retinopathy. When there has been severe bleeding into the eye which has not resolved spontaneously, then the blood (contained with the normal vitreous gel) is removed using fine instruments. The instruments are passed through small cuts in the white part of the eye. If the retina is detached then scar tissue is cut and peeled away from the retina. The vitreous gel does not regrow and your eye does not require the gel for vision. Typically the gel is replaced at the time of surgery with fluid, gas or liquid silicone. Laser and cryotherapy may be used during surgery. Cataract surgery may be required at the time of vitrectomy surgery. Surgery can take one to four hours depending on complexity. Following surgery there will be a gradual improvement in vision over the coming weeks to months. You will need to use eyedrops for 4-6 weeks after surgery.



COMPLICATIONS OF LASER TREATMENT

Discomfort and pain

Fluctuating vision

Some loss of side and night vision

Some loss of colour vision

Slight risk of inadvertent damage to the macula which could reduce central vision

COMPLICATIONS OF SURGICAL TREATMENT

The retina itself may be damaged during the procedure necessitating further surgery

Cataract

Further bleeding into the eye after surgery

Reduction in overall quality of vision

Infection

Complications associated with anaesthesia.

You should discuss the risk of complications with your eye doctor.

