

Q What is laser treatment?

A Laser treatment is simply a means of putting a very controlled burn on the back of the eye. You sit at a slit lamp after a drop of local anaesthetic has been put in your eye. A special contact lens is inserted which keeps the eyelids propped open and allows the doctor to see the back of the eye.

The laser gives bright flashes of light when it is used, but the burns are not usually painful. The residual effect of the bright flashes lasts for some time afterwards. Some people find they can see again within half an hour, but for others it may take the rest of the day. Sometimes the eye aches a little if significant burns have had to be applied. Don't worry - the laser is a medical one, not a military one - it is not Star Wars!

The burns only affect the retina and are used to seal off leaking blood vessels if there are exudates gathering at the macula, or to destroy a percentage of the retina if new vessels are growing, so that the rest of the retina can survive. Because diabetes is progressive, more blood vessels may start to leak or become blocked off with time, and so further treatments may be necessary.

Q What if I get a retinal hemorrhage?

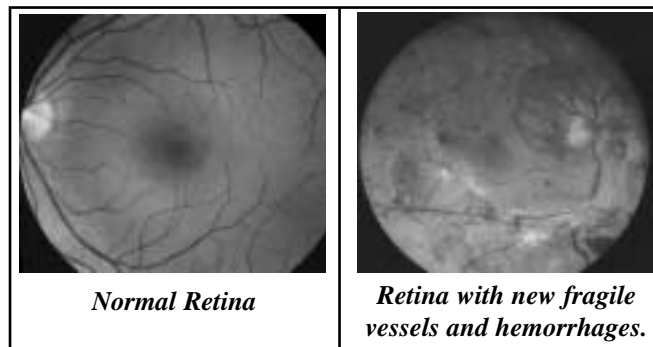
A Small retinal hemorrhages do not matter unless they are very close to the center of vision, because they gradually are re-absorbed. The sort of hemorrhage which matters is a vitreous hemorrhage. This occurs if a blood vessel at the back of the eye bursts, and the cavity between the retina and the lens fills with blood. If this occurs you would notice a sudden mass of 'floaters' in the eye and rapid clouding of your vision (not just blurring). If this happens you should seek urgent advice from the people looking after your diabetes, and if you are not already seeing an ophthalmologist you will be referred to one.

Usually a hemorrhage is left to re-absorb of its own

accord, but if it is not doing so, there is an operation which can be performed to remove the vitreous - the jelly in the back of the eye - along with the hemorrhage. This isn't as bad as it sounds and involves smaller wounds than a cataract operation. Once the hemorrhage has cleared you will almost certainly need laser treatment.

Q Can I stop these changes from happening?

A Good control of your diabetes may help prevent the onset of retinal changes, and yearly eye exams mean that most problems can be treated at an early stage.



Normal Retina

Retina with new fragile vessels and hemorrhages.

Q What are photographic tests?

A In some eye care centers, the backs of the eyes are monitored by photographs, either as baseline screening or in addition to a doctor looking at the back of the eye. There is also a special photographic test which is sometimes needed - a fluorescein angiogram. For this, you sit in front of a camera, dye is injected into your arm and a rapid series of pictures are taken. The dye is inert - it won't do anything to you, but it will make your skin look a bit yellow for 24 hours and your urine will be dark during that time as the dye passes out of your system. The dye outlines the blood vessels at the back of the eye, making it easier to decide whether laser treatment is needed.

Q With all the laser treatments and operations, will I go blind?

A Most of the diabetic problems in the eye can be treated to keep useful vision, but if the macula suffers blocked-off blood vessels, it may cause damage in a way that laser does not help, so a few diabetics do lose their vision. This does not mean that they are blind, just that their central vision is very poor. With reasonable peripheral vision, they can maintain independence. So, keep good control of your diabetes and have regular eye exams to protect your vision.

RESOURCES:

National Eye Institute (NEI)

Box 20/20,
Bethesda, MD 20892-3655

Phone: 1-800-869-2020 (for health professionals only) or
(301) 496-5248 Fax: (301) 402-1065

Email: 2020@nei.nih.gov

Internet: www.nei.nih.gov

National Diabetes Information Clearinghouse

1 Information Way
Bethesda, MD 20892-3560

Phone: (301) 654-3327

Fax: (301) 907-8906

Email: ndic@info.niddk.nih.gov

www.nei.nih.gov/health/diabetic/retinopathy.htm

TO FIND AN OPHTHALMOLOGIST:

American Association of Ophthalmology
http://www.aao.org/eyemd_disclaimer.cfm

2002 Diabetes Research and Wellness Foundation™

All rights reserved.



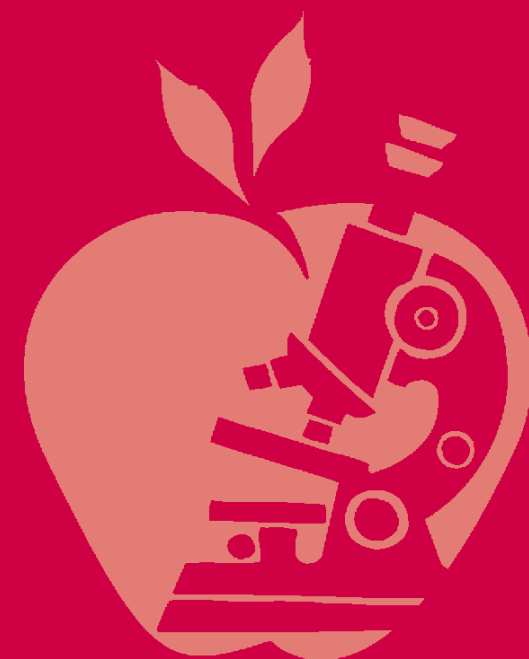
5151 Wisconsin Ave. NW, Suite 420
Washington, D.C. 20016
www.diabeteswellness.net

Helpline Questions 1-800-941-4635
For additional brochures 202-298-9211

D
I
A
B
E
T
E
S

Looking After Your Eyes

Written for DRWF by
Dr W N Wykes FRCS FRCOphth,
Consultant Ophthalmologist



DIABETES RESEARCH WELLNESS FOUNDATION™

There are a couple of conditions at the back of the eye which can cause blurring of the vision. One is cataract, which happens to most of us if we live long enough, but can happen at an earlier age if you have diabetes. The more serious cause of blurred vision is diabetic retinopathy.

DIABETIC RETINOPATHY

The lining at the back of the eye is called the retina. It turns light into a message to the brain, similar to film in a camera, but unlike film, it cannot be changed (there are no retina or whole-eye transplants). The retina has a network of blood vessels which fan out across it, and two main problems can arise with these: they can become narrowed and blocked off, or they can become too 'leaky', making the retina swollen and distorted.

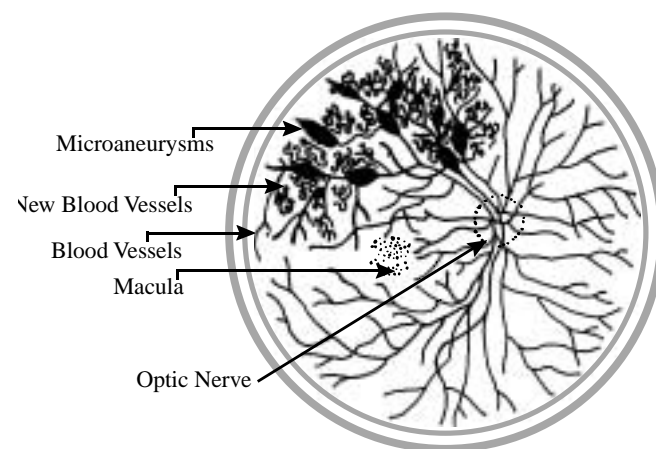
The earliest type of change is called background retinopathy. At this stage there may be a few small hemorrhages within the retina and some leaky blood vessels away from the center of vision, causing exudates to appear. Exudates are fats, called lipids, deposited when serous fluid has leaked from a blood vessel. They can be ignored if they are nowhere near the center of vision, but if there is a collection of exudates near the center, the associated swelling can threaten the central vision. This can be treated with laser surgery to stop its progression.

The center of the retina is called the macula. This is the part you are using as you read this leaflet, although you are still aware of other things around you using your peripheral retina. If the blood vessels supplying the macula become narrowed or blocked, your central vision can become blurred in a way which does not have good successful treatment. However, this does not affect the peripheral vision, only your central vision.

If the rest of the retina has enough small blood

vessels blocked off, it becomes 'ischemic' and sends out a chemical signal to say it is not well. With enough chemical signals, the eye starts to respond by growing new blood vessels. This is called proliferative retinopathy. It sounds like a good idea - the eye helping itself - but they are the wrong type of blood vessels. They may cause scar tissue in the back of the eye. When this occurs the scar tissue pulls on the remainder of the retina, lifting it away from the back of the eye. This causes scarring and may result in bleeding into the cavity of the back of the eye. If your eye specialist looks into the back of the eye and sees new blood vessels growing, or sufficient changes to know they are about to grow, you will be given laser treatment to the back of the eye to stop their growth.

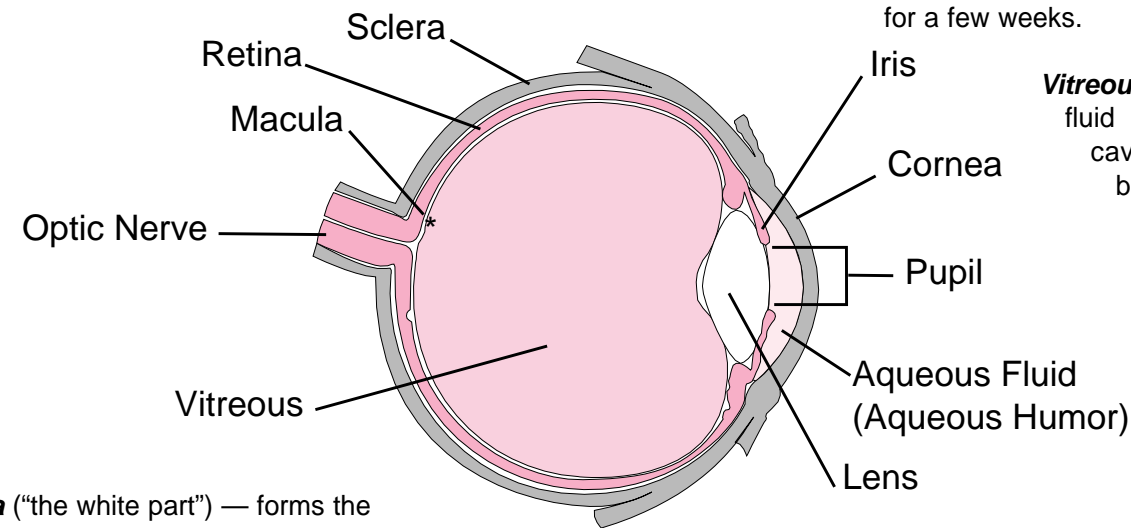
PROLIFERATIVE RETINOPATHY



Q Will I know this is happening?

A Unfortunately, you will usually not be aware of any problems until the changes are quite advanced and affecting the center, and cannot easily be treated. That is why it is so important to schedule a yearly check-up. You will not know about new blood vessels growing until they have filled the back of the eye with blood (vitreous hemorrhage) or started to drag off the retina (retinal detachment). Either way, it is damaging to the eye, so be sure your eyes are checked annually.

ANATOMY OF AN EYEBALL



focused on the retina in the back of the eye. Changes in blood glucose levels can change the size and shape of the lens, causing temporary blurred vision that usually subsides when blood glucose levels have been stabilized for a few weeks.

Vitreous - a clear, jelly-like fluid located in the rear cavity of the eye between the back of the lens and the retina. Vitreous helps maintain the shape of the eye and allows for unobstructed transmission of light rays to the retina.

Sclera ("the white part") — forms the tough outer coat of the eyeball that protects the inner structures and helps maintain the rigidity of the eyeball.

Iris ("the colored part") — a donut-shaped structure containing special muscle tissue that controls the size of the pupil.

Cornea - is a continuation of the sclera at the front surface of the eye. It is thinner than the sclera and transparent so that light can enter the front of the eye. Because of its curved surface it bends the light rays, squeezing them together so that they can enter the eye through the pupil.

Pupil - An opening in the iris. Using the donut analogy, the pupil would be the donut hole, so it is actually a hollow space. The size of the pupil determines how much light enters the eye. When the amount of light is excessive, the iris makes the pupil smaller. In dim light or darkness, the iris makes the pupil larger.

Lens - a transparent, elastic ball located just behind the iris. Both its front and back surface are curved so it bends light rays two more times so that they can be

Retina - the innermost lining of the back of the eyeball that contains specialized, light-sensitive nerve cells capable of converting energy from light rays into electrical impulses. The electrical impulses are then transmitted onto nerve tissue extensions called axons. The axons converge in the back of the eye where they form the optic nerve.

Optic Nerve - transmits the electrical impulses from the retina to the brainstem in the lower back of the brain. The brain stem directs the impulses into the right and left visual cortex of the brain where the electrical impulses are converted into images that can be interpreted into what we call vision.

Macula - an area near the center of the retina that is responsible for central vision which is necessary for close work and reading. It is about the size of a pin head.

Aqueous Fluid - Watery fluid located in the front cavity between the cornea and the lens. Helps to maintain the shape of the eye.