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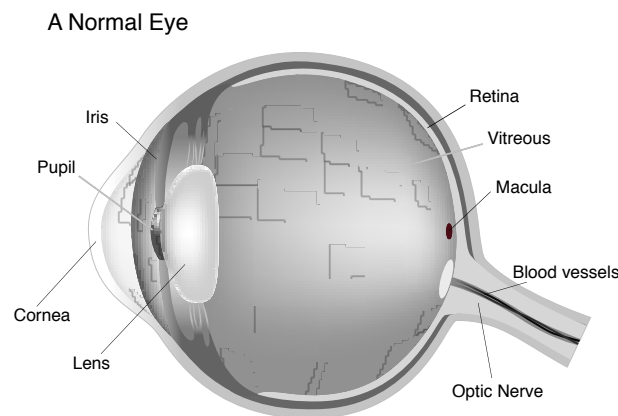
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Patient Information: Age-Related Macular Degeneration

What is the macula?

The retina lines the inside of the back of the eye. It functions a bit like the film in the back of a camera - absorbing light to form an image of the outside world.

The most important part of the retina is the macula - this is the part of the retina that the incoming light is focused on. It gives central vision that is important for fine visual tasks such as reading and driving.



What is age-related macular degeneration (AMD)?

Age-related macular degeneration is commonly divided into two types: wet AMD and dry AMD.

Wet AMD occurs when new blood vessels grow and then leak fluid and blood into the macula. This is usually termed choroidal neovascularisation. It can cause damage and scarring to the macula.

Dry AMD has small yellow macular deposits called drusen. In more severe dry AMD the substance of the macula degenerates (atrophies).

Whereas wet AMD can develop quite quickly, with vision reducing over days or weeks, dry AMD develops very slowly, over months or years. There are early forms of AMD that have no new vessels or atrophy of the macula. However, with time they do sometimes progress to more advanced types of AMD.

Dry AMD usually affects both eyes, although sometimes one eye will be affected long before the other, and the severity can vary considerably between eyes. Some with dry AMD may go on to develop wet AMD, so that wet and dry AMD may co-exist.

What are the symptoms of AMD?

Mild AMD may have no symptoms at all, whereas advanced AMD can have a severe impact on vision. People with AMD seldom go completely blind, but the loss of central vision may make fine visual tasks like reading and driving more difficult, or sometimes impossible. Peripheral vision is usually not affected.

One of the first symptoms people often notice is difficulty seeing fine detail. You may find it harder to read small print even, even with your reading glasses. Straight lines might look wavy or distorted. You may notice a slight smudge in your sight, or a blurred area in the centre of your vision.

If you have changes in your vision you should have your eyes examined. If the changes are gradual you could start by visiting your optician, to see if spectacles will resolve your symptoms.

If you notice sudden changes in vision, particularly blurred or distorted vision, you should call Professor Jackson urgently, as this may potentially signal the development of wet AMD, and wet AMD is best treated promptly.

What causes AMD?

The exact cause of AMD is not known, but some of the factors thought to increase your risk of AMD are:

Age: AMD is most often seen in people over the age of 60, although some people develop it in their 50s.

Gender: More women have AMD than men, probably because women tend to live longer.

Genes: Certain genes increase the risk of AMD. People with a family history of AMD have an increased risk.

Smoking: Smoking increases the risk of developing AMD. Studies show that stopping smoking can reduce the risk.

Sunlight: Exposure to sunlight may increase the risk of developing AMD. If outdoors in bright conditions it may help to wear sunglasses.

Diet: A balanced diet with plenty of fresh vegetables and fruit may help reduce your risk of AMD. Some studies suggest that vitamins A, C and E and zinc can slow the development of wet AMD in your other eye, if you already have it one eye.

Other: Being overweight, lack of exercise and high blood pressure are associated with an increased risk of AMD.

How is AMD diagnosed?

Diagnosis usually involves a combination of clinical examination, high-resolution laser photographs of the eye (Optical Coherence Tomography, OCT) and a specialised test to visualise the blood vessels in the eye (fluorescein angiography).

How is Dry AMD treated?

Unfortunately, there are currently no treatment options for dry AMD, but there are often things that can be done to help. For example, low vision aids may maximize the available vision, as may treatment of other eye disease such a cataract (an opacity in the natural lens of the eye). A small minority of people might benefit from telescopic implants. Support groups and patient information can also help, and for those with advanced disease, registration as being sight impaired may help mobilise resources.

Professor Jackson usually advises approximately annual review. You should also see your optician approximately yearly and it can help to stagger these appointments, so that you see an eye professional every six months.

What are eye injections for wet AMD?

Eye injections are the standard way of treating wet AMD. Drugs are injected into the vitreous cavity, the inner cavity of the eye (intravitreal injection). The standard drugs are designed to reduce the level of Vascular Endothelial Growth Factor (VEGF) inside the eye. VEGF is a chemical that causes the abnormal new blood vessels to grow and leak fluid. Common anti-VEGF drugs are:

- Eylea (afilbercept)
- Lucentis (ranibizumab)
- Beovu (brolucizumab)
- Avastin (bevacimumab)

Avastin is not licensed for use in the eye, but it is commonly used worldwide as an 'off-label' drug as it has similar effectiveness and costs less. The reason Avastin is unlicensed is not that it is not unsafe, but because the drug company that owns Avastin also owns the more expensive Lucentis, so it has no commercial incentive to go through the expensive licensing procedure for Avastin.

Whilst all three drugs are very similar, there may be some subtle differences in terms of their safety profile, effectiveness and dosing routine. Professor Jackson can discuss these with you at your consultation, based on the particulars of your case.

Anti-VEGF drugs usually control wet AMD, but do not eliminate it. Therefore, the injections need to be repeated, typically 3-8 times a year.

What do intravitreal injections involve?

Intravitreal injections are usually given at an outpatient clinic visit. A nurse will get you ready for your treatment. You will lie on a couch in a sterile treatment room. You will be given eye drops to numb your eye and an eyewash will be used to clean your eye and the skin around it. Your face will be covered by a special drape and your eyelids will be held gently open with a small clip during the procedure, so that it does not matter if you blink.

Professor Jackson will give the injection into the white of your eye. Most people say that the injection is painless, but you might feel a slight pressure, or a very brief discomfort lasting less than a second. Your vision may be blurry after your injection, so you should not drive until your vision returns to normal.

Most people will start with a course of three injections, each given a month apart. Thereafter, depending on which drug and dosing routine you choose, you might move to fixed regular injections, such as every two months, regular review but injections only if the wet AMD is active, or an injection each visit, but with varied visit intervals. At each visit you will have an examination, consultation, and OCT scan to monitor your progress. Most people require ongoing injections, but the number of injections and follow-up interval varies widely across individuals.

What are the benefits of anti-VEGF intravitreal injections?

Injections aim to improve or maintain vision. Clinical trials suggest about 95% of patients maintain much of the vision they had when the disease occurred, in the year after treatment. About a third of patients have a meaningful improvement in vision. Subsequent 'real-world' studies suggest vision can tend to decrease slowly over the longer term, but this reduction in vision is likely to be much less than would occur without treatment.

What are the risks of anti-VEGF intravitreal injections?

Before starting treatment it is important to consider the risks and benefits of anti-VEGF eye injections. In general, injections offer a visual outcome that is far better than doing nothing and they are very safe. However, all treatments carry some risk.

Following your injection you may get a bloodshot eye or see moving spots in your vision. These are normal side effects and should improve in a few days. If they do not, or if they get worse, please contact our office.

Often the eye feels a bit gritty after an injection, for a few days. If it does, you can use some artificial tears, available as eye drops over the counter from pharmacies. They can be used as often or little as you like. The nurses will often give you some to take away after the injection.

Some people might feel a little bit of pain or discomfort after their injection. If you like you can take everyday painkillers such as paracetamol. If the pain does not go away, or gets worse, you should contact our office straight away on 020 7060 1968.

Other common side effects are an increase in eye pressure and detachment of the vitreous (gel-like substance inside the eye). The raised pressure tends to settle, and the vitreous detachment is usually harmless.

Injections can occasionally damage the natural lens of your eye, or lead to detachment of the retina; both can damage the vision and require surgery, but thankfully they are rare.

The most serious problem is infection inside the eye (endophthalmitis). This requires urgent treatment with an antibiotic injection into the eye, but despite treatment endophthalmitis can often damage the vision, sometimes severely so. It could even lead to loss of the eye. However, endophthalmitis is extremely rare, occurring in only about 1 in 2,000 to 1 in 6,000 injections.

It is possible that anti-VEGF injections may be associated with an increased risk of stroke or heart attack, although the risk is very small, and indeed some studies question if it exists at all. However, if you have previously had a stroke or heart attack please inform Professor Jackson.

Vitamin supplementation

Patients with wet AMD in one eye may benefit from specific vitamin supplements to reduce the risk of the other eye becoming involved. It may also be suitable if you do not have wet AMD in either eye, but certain features that point to a high risk of progression to wet AMD.

The AREDS study found that a specific vitamin combination reduced the risk of fellow eye developing wet AMD by about a third. The subsequent AREDS2 study refined the formulation. However, the evidence points to benefit only if specific eye characteristics are met, so ask Professor Jackson if these vitamins are suitable for you.

There are many AMD vitamin supplements on the market, but only a small minority mirror the AREDS2 formula, so it is important to select the right one. This is particularly important for smokers or former smokers, as there is a concern that the wrong vitamin combination may increase the risk of lung cancer.

A safe option for both smokers and non-smokers is Viteyes 2, one softgel twice daily, but there are others. Viteyes 2 can be purchased online or from pharmacies, and is sometimes prescribed on the NHS so you might ask your GP for a prescription (albeit with no guarantee they will provide it).

Is there new research into treatments for AMD?

Professor Jackson has a particular interest in AMD research, so feel free to ask him for an update. There are always new treatments under investigation.

Wet AMD

There are many new developments in wet AMD research, including new drugs, longer acting agents (to reduce the frequency of eye injections), the use of radiation (to produce a more durable effect than eye injections), and many others.

Dry AMD

There is growing interest in new treatments for dry AMD. There are several implantable telescopic lenses but only a small proportion of patients are likely to benefit. The evidence for many implants is currently lacking.

There are large high-quality trials of drugs that are injected into the eye. These aim to slow the atrophy of macular tissue but unfortunately they do not restore vision. Results to date have been somewhat disappointing, but research is ongoing.

There are some novel stem cells trials underway, but beware of stem cell treatments offered outside of high-quality clinical trials, as the evidence does not yet support routine use of stem cells for dry or wet AMD.

Enrolling in clinical trials

If you wish to explore the option of enrolling in clinical trials of wet and dry AMD you are welcome to contact Professor Jackson's research coordinator at King's College Hospital on 020 3299 1297. She will be able to outline the trials that are currently underway.

Any further questions?

Please feel free to ask Professor Jackson any questions you might have. You can contact our office on 020 7060 1968.

There is a wealth of information available on the internet, but it is of variable quality. However, The Royal College of Ophthalmologists provides useful patient information leaflets on AMD, www.rcophth.ac.uk/patients/information-booklets, and links to eye charities, www.rcophth.ac.uk/patients/links-to-charities.

The Macular Society has excellent information on both wet and dry AMD.

Both the RNIB and the Macular Society can offer practical and emotional support if you are struggling to cope with macular disease.

RNIB Helpline:

Phone: 0303 123 9999
Email: helpline@rnib.org.uk
Web: www.rnib.org.uk

Macular Society:

Phone: 0300 3030 111
Email: help@macularsociety.org
Web: www.macularsociety.org

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