# Anti-VEGF treatment

Anti-VEGF (vascular endothelial growth factor) treatment involves a group of medicines which reduce new blood vessel growth, known as neovascularisation, and swelling, known as oedema. They can be used to treat a number of eye conditions that cause new blood vessel growth or swelling under the macular area of your retina, the lining of the back of the eye.

The macula is a tiny area of your central retina which is very important for seeing detail, colour and objects directly in front of you. When there is new, abnormal blood vessel growth or swelling at the macula, it can cause problems with your central or detailed vision and with tasks such as reading, watching television or recognising faces. Anti-VEGF treatment usually has to be started quickly, before the new blood vessels or swelling cause too much damage to the macula.



Image description: Diagram of cross section of eye (labels: cornea, pupil, iris, lens, vitreous gel, retina, macula, fovea, optic nerve)

## What eye conditions is anti-VEGF treatment used for?

Anti-VEGF treatment is used for different retinal conditions including the following:

### “Wet” or neovascular age-related macular degeneration (“Wet” AMD)

In ”wet” AMD, there is growth of new blood vessels underneath the macula. These new blood vessels are very weak and leak both fluid and blood, damaging the cells of the macula.

You can find more information about wet AMD on our website **rnib.org.uk/eyehealth** or by calling our Helpline on **0303 123 9999**.

### Diabetic macular oedema (DMO)

Diabetes mellitus can affect the blood vessels of the retina and can cause these blood vessels to become leaky. If there is a leakage of fluid from the blood vessels near the macula, this can cause waterlogging and swelling of the macula, known as macular oedema. This means the cells of the macula are not able to work properly.

You can find more information about diabetes related eye conditions on our website [**rnib.org.uk/eyehealth**](http://www.rnib.org.uk/eyehealth) or by calling our Helpline on **0303 123 9999.**

### Macular oedema caused by retinal vein occlusion

Retinal vein occlusion occurs when one of the veins of the retina becomes blocked. Veins are responsible for draining away deoxygenated (used) blood from the retina. When one of these veins becomes blocked the blood cannot drain away, causing blood and fluid to leak out of the vein and collect in the retina. This results in waterlogging of the retina and damage to the retinal cells at the back of the eye. Macular oedema occurs when this fluid collects at your macula.

You can find more information about retinal vein occlusion on our website [**rnib.org.uk/eyehealth**](http://www.rnib.org.uk/eyehealth) or by calling our Helpline **0303 123 9999**.

### Myopic choroidal neovascularisation (myopic CNV)

Myopic CNV can occur in people who are very short sighted (myopic). High myopia is when your eyeball is longer than normal. This can cause the retina to become thinner and stretched. Breaks in the lining of the retina can appear. New blood vessels can then grow from underneath the retina, from a layer called the choroid. These new blood vessels are very weak and leak blood and fluid, which can damage the cells of the macula.

You can find more information about eye conditions related to myopia on our website [**rnib.org.uk/eyehealth**](http://www.rnib.org.uk/eyehealth) or by calling our Helpline on **0303 123 9999.**

There is interest in using anti-VEGF treatments for other eye conditions that cause new blood vessels, bleeding and swelling at the back of the eye.

Your ophthalmologist (hospital eye doctor) should be able to discuss with you whether your eye condition can be treated with anti-VEGF treatments and let you know if it can be provided on the NHS, privately or whether they will be able to obtain funding for your treatment.

## What does anti-VEGF mean?

The term "anti" means against and "vascular" refers to blood vessels. Anti-VEGF stands for 'anti vascular endothelial growth factor'. Vascular endothelial growth factor (VEGF) is a protein produced by cells, either when there is not enough oxygen or blood flow to an area or in response to inflammation. It promotes leakiness of normal blood vessels and can stimulate the growth of new blood vessels in that area. Anti-VEGF drugs work by blocking the action of these proteins, helping to reduce new blood vessel growth or swelling in the macula. This in turn can help to slow down or delay sight loss.

There are a number of different types of anti-VEGF drugs available, but they all work in a similar way. Some types are licensed for use in the eye. Your ophthalmologist can explain the different types of anti-VEGF drugs available for your eye condition.

## What tests might I have before my treatment?

Depending on your eye condition, your ophthalmologist will perform tests to decide whether treatment with anti-VEGF injections is the right option for you.

The common tests used to examine your retina are:

* Slit lamp examination
* Optical coherence tomography (OCT) and OCTA
* Fluorescein angiography

### Slit lamp examination

For this examination the ophthalmologist uses a microscope called a slit lamp, so that they can see your macula by looking through your pupil. Usually, eye drops will be used to dilate (enlarge) your pupils for better viewing before the examination. The ophthalmologist uses the microscope to view your macula and can see any changes your condition has caused.

### Optical Coherence Tomography (OCT) and Optical Coherence Tomography Angiography (OCTA)

An OCT is a scanner that provides a cross section image of the retina, showing the layers of the retina and giving a detailed picture of your macula.

An OCT allows your ophthalmologist to measure the thickness of the macular area. If your macula is thicker than it should be, this can indicate swelling. OCT can also be used to compare your macula before and after treatment to make sure that the treatment has been effective in reducing the amount of fluid and swelling.

OCTA is a similar test to an OCT scan and allows your doctor to detect unhealthy blood vessels in the retina without the need to use a dye such as with the fluorescein angiogram.

Eye drops may be used to dilate your pupil before the scan. The scan involves sitting in front of the OCT machine and looking at a light while your eye is scanned. OCT is a painless procedure. It doesn’t involve any physical contact with your eye, and only takes a couple of minutes to complete.

### Fluorescein angiography

Fluorescein angiography provides a picture of the layer of blood vessels underneath your retina.

This test is carried out using a yellow dye called fluorescein, which is injected into your arm. The fluorescein travels through your blood stream to the blood vessels in your retina. While the dye is travelling through the blood vessels under your retina, a series of photographs are taken. These photographs will show the blood flow through your vessels, and your ophthalmologist will be able to see whether there are any areas of leaking or bleeding, as well as the location of these.

It’s a very common test and very few people have any major side effects – the most serious one is an allergic reaction to the dye, but this is rare. The dye from the injection may make your skin look slightly yellow for a day or two. Your urine may also appear a darker yellow than normal (possibly for up to two to three days) but it often fades more quickly than that.

Depending on your eye condition, your ophthalmologist may want to do additional tests or may not carry out tests every time you visit the eye clinic. Your ophthalmologist will be able to tell you which tests you need for them to manage and make decisions about your treatment.

## How is anti-VEGF treatment given?

Anti-VEGF treatment is given as an injection into the white of your eye (the sclera). The drug is injected directly into the vitreous, the jelly that fills your eye. This is called an “intravitreal” injection. The procedure is generally very straightforward and quick and isn’t usually painful.

The injection needs to be given in a sterile way to reduce the risk of infection. You may have the treatment in an operating theatre, though more commonly, it may be given in a room which has been designed for this type of treatment (sometimes called a clean treatment room).

The injection may be given by an ophthalmologist or another eye care professional who has been trained in giving anti-VEGF injections, such as a nurse or optometrist (optician) at the hospital.

Before the injection, you’ll be given anaesthetic eye drops to make your eye numb and antiseptic drops to clean the eye and to help prevent you from getting an infection. The injection is not usually painful, but your eye may be a little sore after the anaesthetic wears off. This discomfort lasts for 24-36 hours.

The needle used for the injection is small and short and the injection itself only takes a few seconds. As you will have had an anaesthetic drop in your eye, the injection feels like a small point of pressure on your eye rather than a scratch. You can’t ‘see’ the injection being delivered as it is given in the side of your eye, away from your direct line of sight.

The following are basic steps for giving an anti-VEGF injection; however, your hospital may have their own procedures:

* You may be given eye drops which dilate your pupil. This allows your ophthalmologist to examine the back of the eye before your injection.
* You’ll be asked to sit or lie down on a bed or bench.
* You’ll be given local anaesthetic eye drops to help make the injection as pain free as possible. Some people may also be given a local anaesthetic injection. Your eye will be cleaned with anti-septic eye drops to help prevent infection.
* A small clip called a speculum is often used to keep your eye open and prevent you blinking, and the area around your eye may be covered by a drape.
* Once your eye is numb, you’ll be asked to look away to one side and the injection will be given into the white part of your eye.

As the injection is being given, you may notice some swirls in your vision which will gradually disperse. If some air is accidentally injected with the anti-VEGF treatment, you may see one or more dark round shapes at the lower edge of your eye. These clear within a day or two.

After your injection your vision may be blurry for several hours because of the dilating eye drops. This should improve by the next day.

You are generally able to return to normal everyday activities straight away after an anti-VEGF injection. However, it’s important to avoid rubbing your eye, getting water into your eye or swimming for the first few days following your injection.

## I’m worried about having an injection into my eye, is there any support?

Although the thought and experience of having an injection into the eye can be unpleasant, not having treatment can mean you will lose more and more of your central vision.

If you‘re worried or frightened of having injections into your eye, it may help to talk to someone who has already experienced the injections. The Macular Society can put you in touch with a ‘treatment buddy’ who can support people who are anxious about their injections and offer information and reassurance. More information can be found on the Macular Society website; their details are listed at the end of this information.

## What are the complications of anti-VEGF injections?

The risk of complications from anti-VEGF injections is very small. Most of the possible complications come from having an injection into your eye, rather than the anti-VEGF drug itself. For most people, the benefit of having the treatment to protect your sight outweighs the very small risk that comes with the injection.

It’s been suggested that there may be a link between anti-VEGF injections and stroke or heart attack. However, this link may be incidental because many people who have anti-VEGF treatment are in the same age group as those who already have high risk factors for strokes and heart attacks.

Common complications due to anti-VEGF injections can include:

* Slight ache or pain in the eye lasting a day or two
* Temporary floaters - clearing in a week
* Bruising on the white of your eye that appears red or bloodshot, but this should clear in a week or two
* Eye may feel sore and gritty

Rare complications that may occur from the treatment can include:

* Infection. This risk is minimised with the use of sterile equipment and using a clean room. Symptoms of an infection inside the eye can include a very painful and red eye, sensitivity to light and your sight becoming blurred. If you develop these symptoms in the days following your injection, you need to be checked immediately by your eye hospital.
* Increase in eye pressure. This is more of a risk in people who have glaucoma. If you have ocular hypertension (high eye pressure) or glaucoma, your eye pressure may be checked after each injection. For most people, an increase in eye pressure is temporary and usually resolves on its own without causing any long-term problems.
* Retinal detachment. An injection into the eye carries a very small risk of the retina detaching away from the back of the eye. A retinal detachment can be treated with surgery, but this needs to be done urgently to prevent sight loss in that eye. The symptoms of a retinal detachment include floaters and flashes of light in your vision and some people notice a curtain effect or shadow coming across their vision. If you notice these symptoms following your injection, you should let your eye clinic know immediately.
* Bleeding in the eye.
* Inflammation inside the eye.
* Cataract. A cataract is a clouding of the lens inside the eye which can cause sight to become cloudy or misty. A cataract can be treated with surgery to remove the cloudy lens and replace it with a clear artificial lens.

Although some of these complications are serious, they can be treated, so permanently losing your sight following an anti-VEGF injection is rare.

## How will I be followed up during my treatment?

Depending on your eye condition and how well your treatment is working, your ophthalmologist will arrange for you to have ongoing tests. These will show how much effect your anti-VEGF treatment has had on new blood vessel growth or the swelling in your macula. Your visual acuity (how well you can see) will also be tested, usually by reading down a letter chart.

Your visual acuity results and the signs of swelling or blood vessel growth shown by the tests will help your ophthalmologist to decide whether you need more anti-VEGF injections. Anti-VEGF treatment can only work if there is active leaking of blood and fluid at the back of your eye.

### 'Wet' age-related macular degeneration (AMD)

If you are diagnosed with wet AMD you should receive an initial assessment and your first anti-VEGF injection, if required, within two weeks of referral to the hospital or another eye clinic. Usually, you will start by having a course of three injections, once every four weeks for three months. This is known as a “loading dose”.

How often you need further injections will depend on the type of anti-VEGF drug you are receiving and how well the treatment is working. Your ophthalmologist can explain the different types of anti-VEGF drugs available and let you know how often each may need to be given. Your ophthalmologist will decide how often you need to be monitored at the eye clinic and how frequently you might need more injections depending on how your eye condition is responding to treatment.

It’s very common for people to have more injections after the first three. Some people may need to have an injection once a month or every two months on a regular basis until the bleeding and swelling is brought under control and their sight stabilises. Other people may have a few months when they don't need any treatment and their injections are more spaced out over the year.

### Macular oedema caused by retinal vein occlusion

Usually, you will start with a loading dose of three anti-VEGF injections, once a month for three months. After this, your ophthalmologist will check how well the treatment is working. It’s quite common for people to have more injections after the first three. Your ophthalmologist may want to see you fairly regularly in the eye clinic for the first 6 months and then perhaps less so for the next 12 months.

### Diabetic macular oedema (DMO)

Anti-VEGF treatment for DMO is given when the amount of fluid or swelling has caused your macula to thicken by a certain amount. Injections are usually given once a month to begin with, and then may continue to be given monthly or may be given every two months. How many injections and how often you might need them will depend on the type of anti-VEGF drug you are receiving and how the DMO responds to treatment. Your ophthalmologist should let you know how often they would like to see you at the eye clinic to monitor your condition.

### Myopic choroidal neovascularisation (myopic CNV)

Treatment for myopic CNV usually starts with one anti-VEGF injection. After this you’ll normally be monitored at the eye clinic every month for the first couple of months. You may be given further injections at these visits if your ophthalmologist thinks they are needed. If your condition becomes stable, you may not need further injections, but you’ll still be monitored closely, normally around once every three months for the first year.

### Monitoring my eye condition

For anyone having anti-VEGF treatment it is usually necessary to have frequent check-ups at the eye clinic to ensure that there’s no deterioration in vision between injections.

You should always go straight back to the eye clinic if you feel your vision is getting worse or start to notice further distortion in your vision between your appointments at the eye clinic.

## How successful is anti-VEGF treatment?

Anti-VEGF treatments are very successful and give a good chance of preventing further sight loss. In most cases, the aim of treatment is to stabilise vision and prevent it from getting worse. In some cases, treatment can also help to improve vision and reduce distortion.

How much your vision will improve will depend on your individual circumstances. It may not help with any other eye conditions that you have. Generally, the better your level of vision is before starting treatment, the better the outcome is likely to be. You should ask your ophthalmologist what improvement they would expect, as they will be able to consider your individual circumstances and eye condition.

Although anti-VEGF treatment can mean a lot of injections and visits to the hospital, it is a very successful treatment and has significantly improved visual outcomes for these conditions.

Trials are ongoing into looking at ways to extend the effectiveness of these medications and reducing frequency of injections as well as visits to the hospital. These include anti-VEGF drugs that are effective for a longer period, thereby reducing the frequency of injections; implants containing anti-VEGF drug that can be placed in the eye which is released over a longer period; delivery systems that are implanted into the eye releasing anti-VEGF and refilled as necessary, among others.

## Can I get help to see things better?

Having an eye condition can cause changes to your vision in the long term, but much can be done to help you make the most of your remaining vision and adapt to any changes.

There are lots of things that you can do to make the most of your remaining vision. This may mean making things bigger, using brighter lighting or using colour to make things easier to see. We have a series of leaflets with helpful information on living with sight loss, including how to make the most of your sight. You can find out more about our range of titles by calling our Helpline on **0303 123 9999**.

You should ask your ophthalmologist, optometrist or GP about low vision aids and about having a low vision assessment, where you’ll be able to discuss the use of magnifiers and aids to help you to see things more clearly. If you also have reduced vision in both eyes due to an eye condition, you should ask your ophthalmologist whether you’re eligible to register as sight impaired (partially sighted) or severely sight impaired (blind). Registration can act as a passport to expert help and sometimes to financial concessions. Even if you aren’t registered, a lot of this support is still available to you.

Local social services should also be able to offer you information on being safe in your home and getting out and about safely. They should also be able to offer you some practical mobility training to give you more confidence when you are out.

If you have sight changes, you may be worried about finding work, or staying in your job. Our Employment Line can provide specialist support and advice about employment for people with sight loss. You can contact via our Helpline on **0303 123 9999**.

## Coping

Being diagnosed with an eye condition can be very upsetting. You may find that you are worried about the future and how you will manage with a change in your vision. All these feelings are natural.

It can sometimes be helpful to talk about these feelings with someone outside your circle of friends or family. At RNIB, we can help with our telephone Helpline and our Counselling and Wellbeing team. Your GP or social worker may also find a counsellor for you if you feel this might help.

Your eye clinic may have a sight loss advisor working alongside the doctors and nursing staff. This advisor may be known as either the Eye Clinic Liaison Officer (ECLO), the Vision Support Officer or the Early Intervention Support Officer and they are on hand within your hospital to provide you with further practical and emotional support about your eye health. To find out if your hospital eye clinic has an ECLO, you can search within the RNIB Sightline Directory (**sightlinedirectory.org.uk/**)

Alternatively, you can call our Helpline who would be able to find out if an ECLO is available at your eye clinic.

### Further help and support

Whether you have just been diagnosed or have been living with sight loss for a while, we are here to help and support you through your journey.

The RNIB Helpline is your direct line to the support, advice and products you need. We’ll help you to find out what’s available in your area and beyond, both from RNIB and other organisations.

Whether you want to know more about your eye condition, buy a product from our shop, join our library, find out about possible benefit entitlements, be put in touch with a trained counsellor, or make a general enquiry, we’re only a call away.

RNIB Helpline    
Tel: **0303 123 9999**    
Email: **helpline@rnib.org.uk**

Alexa: you can also say, **“Alexa, call RNIB Helpline”** to an Alexa-enabled device.  

We’re ready to answer your call Monday to Friday 8am to 8pm and Saturday 9.30am to 1pm.

You can also get in touch by post or by visiting our website:

#### RNIB

105 Judd Street

London WC1H 9NE

**rnib.org.uk**

### Other useful contacts

The **Macular Society** offer local support groups for people with macular eye conditions or central vision loss. They have working age groups as well.

**Macular Society**

PO Box 1870, Andover SP10 9AD

Tel: **0300 3030 111**

Web: **macularsociety.org**

Email: **help@macularsociety.org**

### We value your feedback

You can help us improve our information by letting us know what you think about it. Is this factsheet useful, easy to read and detailed enough – or could we improve it?

Send your comments to us by emailing us at **eyehealth@rnib.org.uk** or by writing to:

**Eye Health Information Service**

RNIB

105 Judd Street

London

WC1H 9NE

This factsheet has been written by the RNIB Eye Health Information service. Our factsheets have been produced with the assistance of patient and carer input and up-to-date reliable sources of evidence. The accuracy of medical information has been checked by medical specialists. If you would like a list of references for any of our factsheets, please contact us at **eyehealth@rnib.org.uk**

All our factsheets are available in a range of formats including print, audio and braille.

This factsheet has been produced jointly by RNIB and The Royal College of Ophthalmologists.

RNIB is a member of the Patient Information Forum (PIF) and have been certified under the PIF TICK quality mark scheme.

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