



# Retinal vein occlusion

## What is a retinal vein occlusion?

Occlusion (blockage) of a retinal vein (see figure 1 below) is a common cause of sudden, painless reduction in vision. It occurs when a blockage, often due to a blood clot, forms in a retinal vein.

The retina is the thin membrane that lines the inner surface of the back of your eye. Its function is similar to that of the film in a camera. Blockage of one of the veins draining blood out of the eye causes blood and other fluids to leak into the retina, causing bruising and swelling as well as lack of oxygen. This interferes with the light receptor cells and reduces vision.

occlusions (BRVO) and central retinal vein occlusion (CRVO).

**1. Branch retinal vein occlusions (BRVO)** are due to obstruction of one of the four retinal veins (see figure 2 below). Each vein drains approximately a quarter of the retina's blood supply.

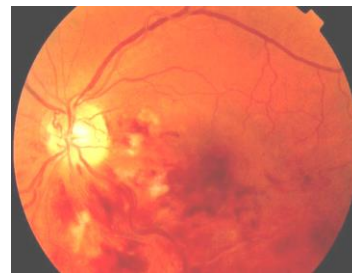


Figure 2- branch retinal vein occlusions

**2. Central retinal vein occlusion (CRVO)** is due to obstruction of the main vein formed from the four branches which drain blood from the retina (see figure 3 below). In general, visual loss is more severe if the central retinal vein is occluded.



Figure 3- central retinal vein occlusion

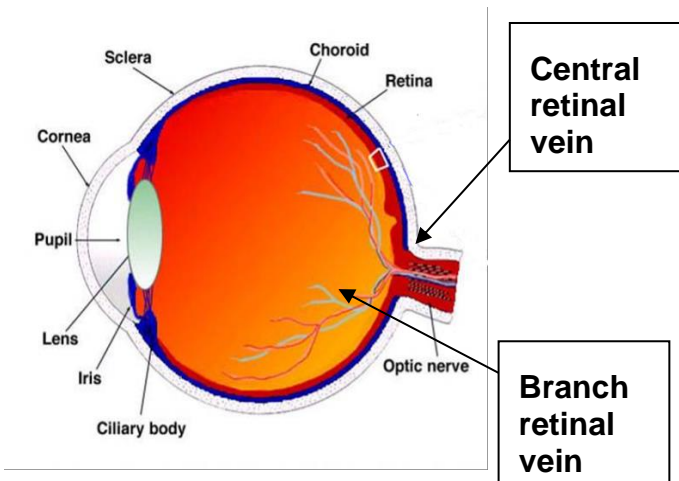


Figure 1-retinal veins

There are two types of retinal vein occlusion, branch retinal vein

## What causes retinal vein occlusion?

A blockage occurs in the vein, often due to clots forming, causing obstruction of blood flow. The exact reason for this happening is unknown, but several common conditions make retinal vein occlusion more likely. These include:

- **High blood pressure:** If your blood pressure is consistently higher than your GP thinks it should be, treatment is normally advised.
- **High cholesterol:** Treatment with tablets is normally highly effective.
- **Glaucoma:** With this common eye condition, the pressure in the eye is raised. This can cause gradual loss of side vision. It also increases the risk of retinal vein occlusion. Treatment with drops to reduce the pressure is normally highly effective in preserving sight and preventing further retinal vein occlusions.
- **Diabetes:** Retinal vein occlusions are more common in people with diabetes. Detection and treatment of diabetes is highly effective in preserving vision and preventing further retinal vein occlusions.
- **Smoking:** The more you smoke, the greater the risk of another vein occlusion. Please speak to your GP if you need help to stop smoking. You can also call the Smokefree National Helpline for advice on 0800 022 4332 or visit <https://www.nhs.uk/smokefree>.

- **Certain rare blood disorders:** These are normally identified by simple blood tests. In the unlikely event that treatment is required, this will be supervised by a specialist in blood disorders.

## Preventing a return of retinal vein occlusion

It is essential to identify and treat any risk factors such as the ones above, to minimise the risk to the other eye and prevent a further vein occlusion in the affected eye. Treatment of any risk factors dramatically reduces the risk of a further vein occlusion occurring in either eye. Without treatment, there is a high risk of retinal vein occlusion returning. This can cause further damage to the sight of the affected eye as well as damage to the sight of the other eye. In a small number of cases, no risk factors can be found, with the cause being unknown.

## Effects of retinal vein occlusion and treatment options

One in three patients with central retinal vein occlusion may experience worsening of vision in the first three years.

In retinal vein occlusion, vision is reduced secondary to:

- 1) Damage to the retina caused by the obstruction to blood flow in the veins. There is no treatment for this.
- 2) Collection of fluid in the retina (macular oedema). There are several successful treatment options for this, which are described below.



## Treating fluid in the retina (macular oedema)

Persistent bruising and swelling at the centre of the retina (the macula) is the main cause of permanent loss of central vision. The swelling is caused by damaged blood vessels which leak fluid.

Different medicines such as anti-vascular endothelial growth factor (anti-VEGF) medicines or steroids may be helpful in reducing this leakage.

**Anti-VEGF medicines** are given as a fluid injection and need to be given every month until maximum vision is achieved. After that, they may be given on extended intervals, depending on whether they are necessary, until there are no signs of active disease.

Treatment is needed for up to four years on average.

**Steroids** are given in the form of an implant injected into the eye which can be repeated every four to six months as needed, for an average of four years.

Injection treatment aims to stabilise or improve vision. About 50% of patients treated with anti-VEGF injections experience a significant gain in vision (a three line improvement on a standard vision chart). Steroid implants achieve a significant gain in vision in up to 50% of patients. However, 20-30% of patients experience no improvement in vision following injection treatment, be it an anti-VEGF or steroid injection.

All injection treatments have potential side effects, including a 1 in 1500 chance of infection, causing decreased vision.

Anti-VEGF injections are also associated with increased risk of cardiovascular side effects. Steroid injections may cause side effects such as the formation of a cataract. They also may cause raised eye pressure, which can result in glaucoma.

The above options for treating macular oedema have both advantages and disadvantages, which may be more or less suitable for each person with retinal vein occlusion. Your ophthalmologist can discuss this in more detail with you. More information on each treatment is available in our Anti-VEGF intravitreal injection treatment leaflet.

If you would prefer not to have active treatment for macular oedema, **observation or monitoring the condition of your eye** is always an option. Branch retinal vein occlusions have a better chance of the fluid naturally clearing up than central retinal vein occlusions. However, early active injection treatment of macular oedema has been shown to achieve the best results in terms of vision improvement. Again, your ophthalmologist can discuss this in more detail with you.

## Treating abnormal new blood vessel growth (neovascularisation)

About 20% of patients with retinal vein occlusions develop abnormal blood

vessels on either the iris at the front of the eye or on the retinal surface. These abnormal blood vessels can bleed or cause a marked pressure rise in the eye, leading to further loss of vision and pain in some cases.

This can normally be prevented by a specific type of **laser treatment** to the retina (called Pan Retinal Photocoagulation or PRP laser). It is important to note that this treatment is aimed at stabilizing and preserving the condition of the eye and so will **not** improve vision. The treatment is most effective if done **before** vision is lost due to new blood vessel growth. For this reason, patients with central retinal vein occlusions are normally reviewed every four to six weeks for six months.

### Follow-up after treatment

If injection treatment is given, you will need to attend appointments for injections or monitoring every four to eight weeks for the first year and then less frequently in the next three years.

### Additional tests available for retinal vein occlusion

The following procedures are frequently recommended for patients with retinal vein occlusion. Your doctor will explain the reasons for them in more detail with you in person.

- **Fluorescein angiography** is a diagnostic test which involves the injection of fluorescein (yellow) dye into your bloodstream via a vein in your hand or arm. This is followed by

a series of retinal photographs taken over several minutes. This test gives your doctor more information about the condition of your retina, which will help decide which treatment is most appropriate for you.

- **Optical coherence tomography (OCT)** measures the amount of retinal swelling (macular oedema) which, like fluorescein angiography, helps decide which treatment is most appropriate for you. OCT is also used to monitor your retina over time and can show how effective any treatment may have been. It is effectively 'optical ultrasound', a non-invasive test, using reflections from within your retina to provide a cross-sectional picture of the retina.

### In the case of an emergency

If your eye suddenly becomes red, painful or your vision worsens, go to Moorfields A&E department in City Road (open 24/7 for emergency eye problems only).

### Further information

You may find the following websites helpful.

[www.rcophth.ac.uk](http://www.rcophth.ac.uk)

[www.rnib.org.uk](http://www.rnib.org.uk)

[www.iga.org.uk](http://www.iga.org.uk)

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Foundation Trust**  
City Road, London EC1V 2PD  
Phone: 020 7253 3411  
[www.moorfields.nhs.uk](http://www.moorfields.nhs.uk)

**Moorfields Direct telephone helpline**

Phone: 020 7566 2345  
Monday-Friday, 8.30am-9pm  
Saturday, 9am-5pm  
Information and advice on eye conditions and treatments from experienced ophthalmic-trained nurses.

**Patient advice and liaison service (PALS)**

Phone: 020 7566 2324/ 020 7566 2325  
Email: [moorfields.pals@nhs.net](mailto:moorfields.pals@nhs.net)  
Moorfields' PALS team provides confidential advice and support to help you with any concerns you may have about the care we provide, guiding you through the different services available at Moorfields. The PALS team can also advise you on how to make a complaint.

**Your right to treatment within 18 weeks**

Under the NHS constitution, all patients have the right to begin consultant-led treatment within 18 weeks of being referred by their GP. Moorfields is committed to fulfilling this right, but if you feel that we have failed to do so, please contact our patient advice and liaison service (PALS) who will be able to advise you further (see above). For more information about your rights under the NHS constitution, visit [www.nhs.uk/choiceinthenhs](http://www.nhs.uk/choiceinthenhs)