## Diagnostic Tests

If you experience any symptoms of eye stroke, it is important that you seek urgent medical attention as soon as possible. Testing may include:

- Referral to medical history for one's health condition and risk factors
- Complete eye examination, including dilated fundus examination, eye pressure measurement, etc.
- Blood pressure measurement
- Fundus photography
- Visual field test
- Optical Coherence Tomography (OCT)
- Fundus Fluorescein Angiography (FFA)
- Blood tests
- Medical check-up to assess the risk of cerebrovascular and cardiovascular diseases (e.g. MRI scan, carotid artery evaluation by Doppler ultrasound, electrocardiography, echocardiography, etc.)

## Treatment

Our ophthalmologist will explain your condition and advise on which treatment is most appropriate for you. Depending on your diagnosis, treatment may include:

- Hyperbaric oxygen therapy (CRAO)
- Eyeball massage (CRAO)
- Lowering the eye pressure (CRAO)
- Retinal endovascular cannulation surgery to displace or lyse the embolus or thrombus (CRAO)
- Intravitreal injection of anti-vascular endothelial growth factor (anti-VEGF) agent or steroids to treat macular edema (CRVO)
- Retinal laser therapy (Pan Retinal Photocoagulation) and intravitreal injection of anti-VEGF agent to treat abnormal growth of new blood vessels (CRVO)
- Modification of risk factors
- Referral to neurology or cardiology for further work-up and treatment for underlying cerebrovascular and cardiovascular conditions



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# Eye Stroke

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While strokes typically occur in the brain, they can also affect the eyes. An eye stroke occurs when the blood supply to the retina or optic nerve is interrupted, leading to sudden and painless loss of vision.

The retina is the inner layer of neurosensory cells that contains a network of blood vessels. The optic nerve connects the eye to the brain, carrying a million of nerve fibres and blood vessels. The retina detects visual signals and sends them via the optic nerve to the brain, enabling sight.

When blood vessels in the retina or optic nerve are blocked, it affects blood circulation and the supply of oxygen and nutrients. An eye stroke is an ophthalmic emergency due to this interrupted blood supply. It can lead to the death of optic nerve and retinal cells, resulting in permanent vision damage within a short period.

## Why do such patients need to see an Eye Specialist as soon as possible?

- Urgent eye procedure may be needed for some patients to prevent visual loss in the affected eye. The earlier the procedure, the better the visual outcomes.
- Patients with giant cell arteritis may require immediate steroid treatment to prevent visual loss in the affected eye and the other eye
- Some patients need urgent treatment or referral due to associated life-threatening conditions like brain stroke or heart disease

## Common Symptoms and Types of Eye Stroke

The common symptoms of eye stroke include sudden and painless loss of vision in one eye but may become bilateral. A dark shadow or defect in the visual field can be seen, and a central scotoma may be present.

There are different types of eye stroke, depending on the structures affected:

### Ischaemic Optic Neuropathy

Ischaemic Optic Neuropathy (ION) occurs due to a reduced blood supply to the optic nerve. This condition can be transient, affecting vision for a few seconds or minutes before returning to normal. ION has two forms: arteritic and non-arteritic. The arteritic form, often caused by giant cell arteritis, is more severe. The non-arteritic form is more common, and often linked with conditions like hypertension, diabetes or smoking.

### Retinal Artery Occlusion

When the blood flow through the central retinal artery is interrupted, the oxygen supply to the entire retina is disrupted. This condition, known as Central Retinal Artery Occlusion (CRAO), typically results in a sudden loss of vision across all visual fields. The vision loss can be transient, lasting from seconds to hours before complete occlusion occurs. Since visual loss may indicate an impending cerebral stroke, patients require urgent referral to neurology or acute stroke management services.

When a branch of the central retinal artery is blocked, causing partial visual loss as only a part of the retina is affected, the condition is known as Branch Retinal Artery Occlusion (BRAO).

### Retinal Vein Occlusion

If the blockage occurs in the retinal veins draining out of the eye, blood and other fluids may build up in the retina and cause ischaemia and macular edema. Lack of oxygen in the retina may also occur and abnormal growth of new blood cells may develop in the eye.

Central Retinal Vein Occlusion (CRVO) is caused by the obstruction of the main vein while Branch Retinal Vein Occlusion (BRVO) is due to the obstruction of a small branch of retinal veins. The severity of vision loss in BRVO is generally lesser than that of CRVO.

## Risk Factors

Certain risk factors and medical conditions may increase the risk of eye stroke. These include:

- Smoking
- High blood pressure (hypertension)
- High lipid levels (hyperlipidemia)
- High blood cholesterol (hypercholesterolemia)
- Low blood pressure (hypotension)
- Cardiac Arrhythmia
- Diabetes
- Glaucoma
- Thrombosis
- Obstructive sleep apnea
- Transient ischaemic attacks (TIA) or cerebral vascular accidents
- Atherosclerotic cerebrovascular or cardiovascular diseases
- Use of certain drugs including oral contraceptive pills and erectile dysfunction medications
- Other rare blood disorders, e.g. polycythemia, sickle cell disease, hypercoagulable state, etc.