Glaucoma

By Dr Boon Ham,
Ophthalmologist,
Suite 8 SouthBank Central

Glaucoma is the second most frequent cause of irreversible blindness after age-related macular degeneration. It is an optic neuropathy, encompassing a group of diseases that damage retinal ganglion cells resulting in a characteristic nerve fibre layer loss, optic disc cupping, and characteristic visual field loss – frequently associated with elevation of intraocular pressure (IOP). Although, the mechanisms of injury relate to compressive forces at the level of the optic disc or impaired perfusion pressure at the level of the optic nerve head, the exact mechanism may not be clearly identified (likely multifactorial, with genetic predisposition). However, intraocular pressure is still currently the best understood and easily identifiable risk factor in glaucoma.

What are the risk factors?

Anyone can develop glaucoma but some are at higher risk:

- Aged over 60
- Race: Blacks are more prone to glaucoma than whites and Asians are more prone to angle-closure glaucoma.
- 6% chance if glaucoma in a 1st degree relative.
- Ocular risk factors: high myopia, chronic uveitis, Fuch's Endothelial Dystrophy, retinal detachment, Pigment Dispersion Syndrome, ocular tumours, Retinitis Pigmentosa and ocular trauma.
- Systemic risk factors: diabetes, hypertension
- Prolonged steroid use.

Does raised IOP always mean glaucoma?

No. Raised IOP in the absence of any other signs of glaucoma is *ocular hypertension*, which carries a 10% chance of developing glaucoma and therefore needs to be followed regularly; and some may be treated as a prophylactic measure.

Can glaucoma develop when IOP is normal?

Yes. Glaucoma with IOP in the normal range is *low or normal tension glaucoma*. The mechanism is thought to be disruption to blood perfusion pressure at the level of the optic nerve head. Systemic factors such as low blood pressure (particularly nocturnal hypotension) and migraine causing fluctuation in blood flow at the optic nerve are linked to optic nerve head damage.

What are the symptoms?

There are no symptoms in most types of glaucoma except *acute angle closure glaucoma* where there is painful loss of vision (a medical emergency). Some patients may become aware of lost peripheral vision (advanced cases), particularly when the good eye is covered for some reason. Glaucoma results in loss of peripheral vision ('tunnel-vision'), eventually constricting down to loss of central vision.

How is glaucoma best diagnosed?

This hinges on good clinical assessment of the optic disc and retinal nerve fibre layer, IOP measurements at various times of the day, and visual fields measurement. Central corneal thickness has recently been found to be a risk factor.

Many highly technical measuring devices are available to aid early diagnosis of glaucoma but it often comes down to careful interpretation of the information acquired and assessment of the patient's overall risk or stage of the disease.

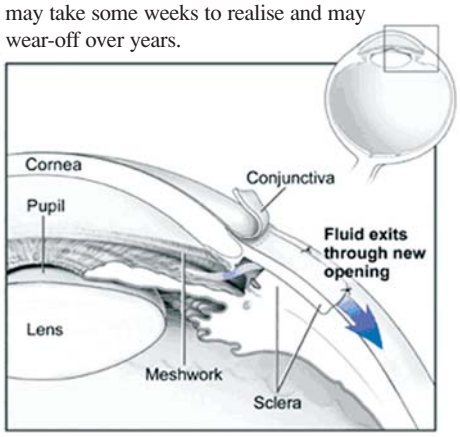
Is glaucoma curable?

No. Visual field loss cannot be recovered. However, some visual field improvement may follow reduction of IOP with treatment.

What are the treatment options?

A 'target' IOP for the individual patient is achieved either medically or surgically.

- Eye drops: Several groups of anti-glaucoma medication are available to reduce intraocular pressure. Compliance and regular IOP check is important.
- Argon Laser Trabeculoplasty: laser spots placed on the trabecular meshwork facilitate aqueous outflow and thus reduce IOP. The effect may take some weeks to realise and may wear-off over years.



- Surgical options are trabeculectomy (a flap of sclera is raised like a trap-door, to provide an alternative aqueous outflow to lower IOP) or a shunt-procedure (a 'plastic tube' is placed in the anterior chamber and the other end placed on the sclera, draining into a special reservoir to provide a constant and stable outflow of aqueous to lower the IOP).

This clinical update is supported by Perth's Eye Surgery Foundation.