

Glaucoma and Eye Drops

Glaucoma, eye pressure and eye drops

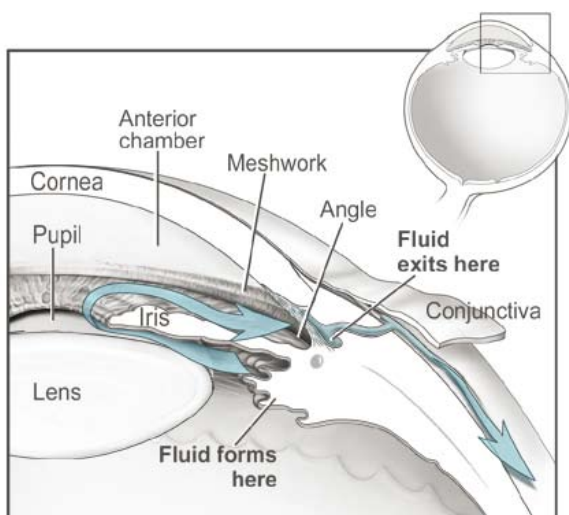
Many of you reading this will be asked by your eye specialist (ophthalmologist) to take eye drops. You will be asked to remember to take these regularly, every day, and yet some may experience side effects from them.

You may also be changed from one drop to another, even though everything may seem fine from your point of view. You may also have friends or family with glaucoma who are on completely different drops. Why is this? What are these drops for? How do they work? Why are they changed? Hopefully this article will answer some of these questions.

Why are eye drops used in glaucoma?

The answer is to help prevent the loss of vision from glaucoma. The exact cause of glaucoma is not known, but we know age, family history and raised pressure in the eyes (intraocular pressure) are risk factors. Of these, only the eye pressure is modifiable, and lowering it slows the loss of peripheral, and then central, vision in glaucoma.

Eye drops are the commonest and preferred way of achieving this. Applying the drug right where it needs to work avoids many side effects that tablets can have. The drugs in these drops work on the ciliary body which makes a fluid called aqueous, and/or on the trabecular meshwork and other drainage pathways for this fluid from the eye. (See diagram). The balance of the flow in and the flow out, determines the intraocular pressure.



Types of eye drops

Beta blockers (Examples: *Betagan, Apotimopt, Timoptol XE*)

“Beta blockers” are named after the type of nerve receptor that they affect. They are found throughout the body, but in the eye, blocking the beta receptors mainly decreases production of aqueous, but also increases outflow slightly.

Side effects may include shortness of breath, or some loss of energy. Anyone with breathing problems or heart conditions should always ensure their ophthalmologist is aware of these.

Prostaglandin analogues (Examples: *Xalatan, Travatan, Lumigan*)



Prostaglandins are chemicals naturally active in the body generally, which increase drainage of aqueous in the eye. Prostaglandin analogues now available are man-made versions of these.

These prostaglandin analogues have essentially no side effects to the body as a whole. They can, however, cause irritation and redness of the eyes particularly for the

first 6 weeks of use, and with prolonged use can give longer and darker eyelashes, and a darker coloured part of the eye (iris).

Alpha agonists (Examples: *Alphagan, AFT, lopicine*)

These drugs are named after the type of nerve receptor they affect. Like beta receptors, alpha receptors are also found throughout the body. Stimulating these receptors means less aqueous is made, and to some extent the drainage is improved.

They can cause irritation, and some patients can develop an allergic reaction to the drug after prolonged use, causing significant eye irritation, often with itching, redness and swelling of the eyelids as well. Other side effects sometimes include a dry mouth and possibly some loss of energy. This drop should not be used with some antidepressant tablets, so make sure your ophthalmologist always knows which medications you are on.

Carbonic anhydrase inhibitors (Examples: *Azopt, Trusopt*)



Carbonic anhydrase is an enzyme chiefly responsible for the production of aqueous in the eye. Therefore, inhibiting it will lower the intraocular pressure.

Side effects from these drugs include a dry mouth, some stinging of the eyes, and possibly some tiredness or headache (generally short-lived).

Miotics (Example: *Piloft*)

Miotics are so named because they 'miosis' the pupil, or make it smaller. This allows more aqueous to drain from the eye. These drops are not widely used now.

Combination drops

Drug companies have made several drops containing combinations of different medications. This obviously has the advantage of getting the benefit of two drops, whilst only having to remember to take one!

In New Zealand only two combinations are funded:

- Cosopt which is dorzolamide (Trusopt) combined with timolol.
- Combigan which is brimonidine (Alphagan/AFT) combined with timolol.

The ophthalmologist's challenge

As ophthalmologists, we have a wide variety of ways to attempt to lower someone's intraocular pressure. The aim is to have the pressure controlled satisfactorily on one drop without side effects. However, because none of us are the same, that 'one drop' may be different for different patients, or may not exist at all. We are all individuals, and our bodies all respond differently to illnesses and medications.

Sometimes a single drop cannot be found which satisfactorily lowers the pressure without side effects, requiring more than one drop to be used. Occasionally an eye specialist will find that a drop which had been working well for years will lose its effectiveness for that patient, requiring a change in medication. Indeed for some patients no combination of drops works satisfactorily, and surgery may be recommended to maintain the eye pressures at a level that is thought safe and will prevent further visual field loss.

The key message for patients with glaucoma is that it is an insidious thief of vision, taking the peripheral vision slowly and irreversibly, often causing no symptoms until the central vision is lost and one is left with blindness.

Therefore, all patients with glaucoma need to use their drops diligently and regularly, so as to hopefully halt, or at least slow, the loss of peripheral vision so that good, useful vision is maintained throughout one's life.