Acetazolamide is often the first drug administered when the condition is diagnosed. It may be injected into a vein for rapid effect and thereafter administered by mouth. Frequent applications of eye drops containing pilocarpine or carbachol are given. An osmotic diuretic such as mannitol may be administered. This draws fluid out of all body tissues, including the eye, and reduces pressure within the eye.

How they work

Drugs for glaucoma act in various ways to reduce fluid pressure in the eye. Miotics improve the drainage of the fluid out of the eye. In chronic glaucoma, this is achieved by increasing the outflow of aqueous humour through the drainage channel called the trabecular meshwork. In acute glaucoma, the pupil-constricting effect of miotics pulls the iris away from the drainage channel, allowing the aqueous humour to flow out. Prostaglandin analogues act by increasing fluid flow from the eye. Beta blockers and carbonic anhydrase inhibitors act on the fluid-producing cells inside the eye to reduce the production of aqueous humour. Sympathomimetic drugs such as brimonidine and apraclonidine are also thought to act partly in this way and partly by improving fluid drainage.

How they affect you

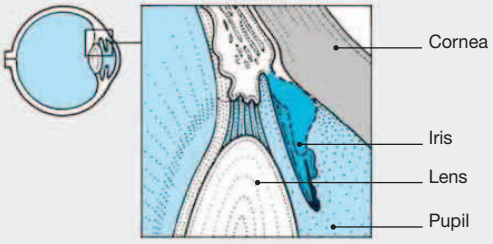
Drugs for acute glaucoma relieve pain and other symptoms within a few hours of their being used. The benefits of treatment in chronic glaucoma, however, may not be immediately apparent since treatment is only able to halt a further deterioration of vision.

People receiving miotic eye drops are likely to notice darkening of vision and difficulty seeing in the dark. Increased shortsightedness may be noticeable. Some miotics also cause irritation and redness of the eyes.

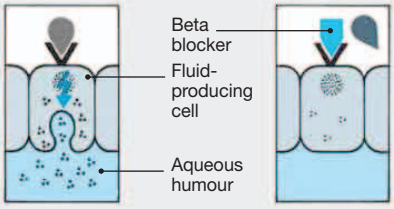
Beta blocker eye drops have few day-to-day side effects but carry risks for a few people (see right). Oral acetazolamide usually causes an increase in frequency of urination and thirst. Nausea and a pins-and-needles sensation are also common.

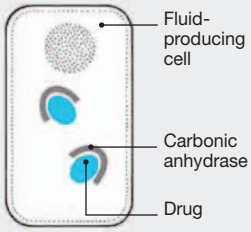
ACTION OF DRUGS FOR GLAUCOMA

Miotics
These act on the circular muscle in the iris to reduce the size of the pupil. In acute glaucoma, this relieves any obstruction to the flow of aqueous humour by pulling the iris away from the cornea (right). In chronic glaucoma, miotic drugs act directly to increase the outflow of aqueous humour.



Beta blockers
The fluid-producing cells in the ciliary body are stimulated by signals passed through beta receptors. Beta blocking drugs prevent the transmission of signals through these receptors, thereby reducing the stimulus to produce fluid.





Carbonic anhydrase inhibitors These block carbonic anhydrase, an enzyme involved in the production of aqueous humour in the ciliary body.

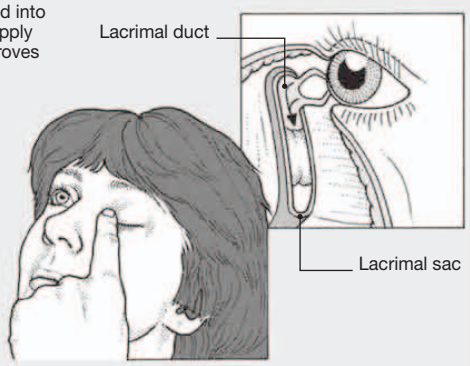
Risks and special precautions

Miotics can cause alteration in vision. Beta blockers are absorbed into the body and can affect the lungs, heart, and circulation. As a result, a cardioselective beta blocker, such as betaxolol, is prescribed with caution to people with asthma or certain circulatory disorders and, in some cases, such drugs are withheld altogether.
The amount of the drug absorbed into the body can be reduced by applying the eye drops carefully, as described (left).
Acetazolamide may cause troublesome adverse effects, including tingling of the hands and feet, the formation of kidney stones, and, rarely, kidney damage. People with existing kidney problems are not usually given this drug.

APPLYING EYE DROPS IN GLAUCOMA

To reduce the amount of drug absorbed into the blood via the lacrimal (tear) duct, apply eye drops as described. This also improves the effectiveness of the drug.

1 Press firmly on the lacrimal sac in the corner of the eye and apply the number of drops prescribed by your doctor.



2 Maintain pressure on the lacrimal sac for a few moments after applying the drops.

COMMON DRUGS

Miotics
Carbachol
Pilocarpine ✻

Carbonic anhydrase inhibitors
Acetazolamide
Brinzolamide
Dorzolamide ✻

Prostaglandin analogues
Bimatoprost
Latanoprost ✻
Travoprost

Beta blockers
Betaxolol
Carteolol
Levobunolol
Metipranolol
Timolol ✻

Sympathomimetics
Apraclonidine
Brimonidine
Dipivefrine

✻ See Part 3