

# Information for patients and carers

## Glaucoma Drainage Tube Implant Devices



This leaflet provides information about glaucoma tube surgery recommended by your ophthalmologist. It is important you ask any questions about the operation and be fully informed before signing the required consent form.

## What is glaucoma?

Glaucoma is a common condition associated with raised fluid pressure inside the eye (intraocular pressure). This may be due to the drainage system in the eye not effectively removing excess fluid. If this remains untreated, the pressure can damage the optic nerve at the back of the eye that relays information to the brain.

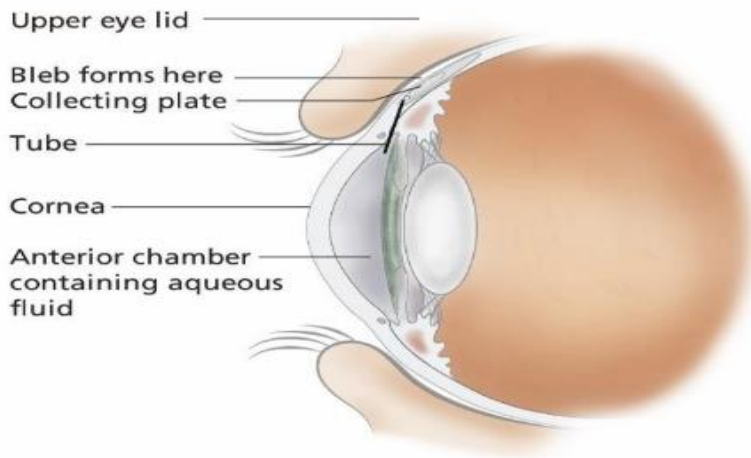
## Why do I need glaucoma tube surgery?

Glaucoma is usually treated effectively with medications and laser to help lower eye pressure. If eye pressure remains uncontrolled, then surgical procedures may be needed to prevent further loss of vision. Your ophthalmologist has advised an operation that utilises a microsurgical tube to help drain fluid and lower eye pressure. The operation helps to preserve your current level of vision and **NOT** restore vision that is already lost.

## What are glaucoma tube implant devices?

A glaucoma tube/drainage device is a device that allows fluid (aqueous humour) from inside the front (anterior) chamber of the eye to drain slowly through a silicone tube into the front surface of a collection plate and forming a reservoir (often called a bleb) of fluid.

The fluid then passes into the surface blood vessels of the eye. The tube is inserted into the anterior chamber of the eye in front of the coloured portion (iris) and well behind the window of the eye (cornea). The plate is positioned within the outer layer of the eye underneath the muscles on the outside of the eye and is well hidden from view by the upper eye lid (see Figure 1).



**Figure 1.** Diagram showing the cross section of the eye explaining fluid drainage from the front of the eye to the collecting plate hidden behind the eyelid.

Below is a photo of a Paul® tube which is just one example of what a drainage device looks like. There are a variety of implants which can be used according to patient needs and clinician preferences.



PAUL® Glaucoma Implant

Actual size is 44.9mm in length (plate and tube) and 23mm in width.

## Before surgery

A full pre-operative assessment will be undertaken if the patient has opted for general anaesthesia. Patients are advised to continue with their current medication regime until the morning of the operation, unless otherwise informed by your doctor.

Patients are also asked to stop blood thinners 72-48 hrs before surgery. The only exception is if patients are on blood thinners for a cardiac prosthetic valve in which case this needs to be discussed with the cardiologist (whom they are under) or at the warfarin clinic. The listing doctor will liaise with the teams to ensure that this is done safely.

## During surgery

During surgery, an anti-scarring agent called Mitomycin C (MMC) is applied to the surface of the eye for a few minutes. MMC is an anti-cancer drug that has also been used in glaucoma surgery for decades to reduce scarring. After application, MMC is washed away from the eye with sterile water so that no residual drug remains.

A patch of donor tissue (usually Tutoplast®) which is commercial **pericardium** (the lining taken from porcine heart tissue) is placed over the tube and underneath the skin of the eye (conjunctiva). This reinforces the tube and prevents it from eroding (breaking down) the skin of the eye. The Tutoplast® is sterilized to remove the Human Immunodeficiency Virus, Hepatitis C Virus, Human T-lymphotropic Virus, Hepatitis B Virus, Cytomegalovirus, Hepatitis A Virus and Parvovirus B19. There are no reported cases of any disease transmission attributable to Tutoplast® in the literature.

The surgery is performed as a day case procedure and takes about 1-2 hours and occasionally longer to complete. However, you will be in hospital for about 3-4 hours.

The surgery is usually done under a general anaesthetic but rarely under a local anaesthetic with or without intravenous sedation when general anaesthetic is not possible due to health reasons.

## What happens after surgery?

A clear protective eye shield will be placed over your eye and is to be worn as advised. You will be given eye drops after your surgery to take as instructed. These are a steroid (anti-inflammatory) eye drop and an antibiotic eye drop to help in the recovery process.

### **You must not drive home after surgery.**

Please continue to use your usual glaucoma eye drops in your other eye if these were prescribed before surgery. It is expected that after the surgery the eye will be red and swollen, this usually settles down in the following weeks. The tube drainage usually slows down in the first three months which is due to healing over the plate and is restored by removing a stitch from within the inside of the tube called a ripcord; this is done at a clinic appointment, using drops to numb the eye and only takes a few minutes.

## Follow up visits

An appointment will be booked for an eye examination the day after surgery and further follow ups are usually scheduled at 1, 2 and 4 weeks to monitor eye health and pressure. The eye pressure may take up to 6 weeks to stabilise.

## How successful is glaucoma tube surgery?

Success rates depend on the drainage implant used during the surgery. Studies show that at an average of 1-2 years after surgery about 70-80% of patients have their eye pressure adequately controlled. A successful procedure may eliminate the need for eye drops; however, patients may still require the need for some medication to maintain control of their eye pressure. Successful implants continue to function over long periods of time.

## What are the risks associated with tube surgery?

There is a minimal chance of infection that may develop inside the eye. This needs to be taken seriously, therefore if you notice any pain, drop

in vision or redness or intolerance to bright lights, please contact staff immediately as per the information at the end of this leaflet.

**High/Low pressure** – After surgery there is a small chance that eye pressure may fluctuate. If the pressure is deemed too high, then further eye drops may be needed. If too much fluid is being drained, then the pressure may drop below desired levels. This can worsen vision and may cause bleeding inside the eye. Rarely, additional surgery may be required.

**Cataract** – The procedure can cause the lens inside the eye to gradually become cloudy and may need an operation sometime later.

**Double vision** – As the tube is placed near the muscles that control eye movement, there is a small possibility that this can cause double vision. This is usually self-limiting and seldom needs further treatment which could be surgical re-aligning of muscles.

**Tube blockage/erosion** – There is a very small chance that the tube may become blocked which could be with blood, iris tissue, silicone oil etc. or even make its way through the conjunctiva and become exposed. Further surgery is required to rectify this defect.

**Corneal clouding** – The ideal position of the tube is over the iris and well away from the cornea, which is the transparent part of the eye. However, there are reported cases of clouding of the cornea as the tube can compromise the inner lining of the eye due to either its proximity or undue tube movements. In such instances, a tube revision, trimming or occasionally even corneal transplant may be needed. Where possible, we check the health of the cornea by doing corneal cell counts before surgery to ensure we can monitor the health of the cornea long term.

## What can I do after tube surgery?

It is advised to refrain from intensive activity such as strenuous exercise (contact sports, swimming up to 3 months, heavy weights and running)

after surgery. Try to avoid getting water in the eye in the first week or two, especially when showering/hair washing. Eye makeup should not be used in the first month after surgery to allow time for the healing process.

Driving will be advised by your ophthalmologist as it depends on your vision and visual field test. Depending on the nature of your work it is possible to resume work within 2 weeks, however, if work requires heavy labour or is in a highly polluted environment then it may take longer to return to work.

## Contact details

We hope this information is sufficient to help you decide whether to go ahead with surgery. Should you require further advice or information please speak to your doctor.

If you have redness, loss of vision, increasing pain or new light sensitivity following the surgery, please contact the number below:

Ophthalmology telephone triage service: **01257 245346**.

**Monday to Friday 9.00am to 4.30pm**

If you feel that your eye condition needs an urgent assessment outside of these hours, please attend the nearest Emergency Department.

## Sources of further information

[www.lancsteachinghospitals.nhs.uk](http://www.lancsteachinghospitals.nhs.uk)

[www.nhs.uk](http://www.nhs.uk)

[www.accessable.co.uk](http://www.accessable.co.uk)

[www.patient.co.uk](http://www.patient.co.uk)

[www.lancsteachinghospitals.nhs.uk/veteran-aware](http://www.lancsteachinghospitals.nhs.uk/veteran-aware)

<https://bepartofresearch.nihr.ac.uk/>

[www.glaucoma-association.com](http://www.glaucoma-association.com)

All our patient information leaflets are available on our website for patients to access and download:

[www.lancsteachinghospitals.nhs.uk/patient-information-leaflets](http://www.lancsteachinghospitals.nhs.uk/patient-information-leaflets)

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If you want to stop smoking, you can also contact Smokefree Lancashire on Freephone **08081962638**

**Please ask a member of staff if you would like help in understanding this information.**

**This information can be made available in large print, audio, Braille and in other languages.**

Our patient information group review our leaflets regularly, if you feel you would like to feedback on this information or join our reading group please contact on email address:

[patientexperienceandinvolve@LTHTR.nhs.uk](mailto:patientexperienceandinvolve@LTHTR.nhs.uk)

**Department:** Ophthalmology

**Division:** Surgery

**Production date:** October 2025

**Review date:** October 2028

**JR 1385 v1**