

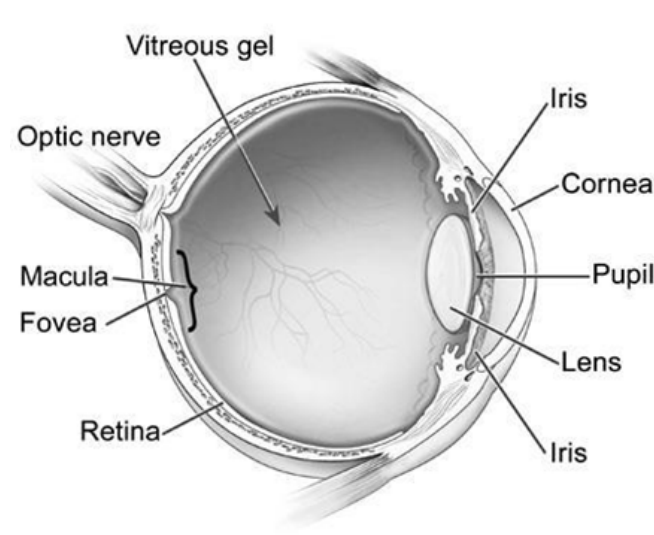
## Aqueous shunt device surgery

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### What is glaucoma?

The optic nerve carries images from the retina (light-sensitive layer of the back of the eye) to the brain; allowing you to see (see figure 1). Glaucoma is the name given to a group of conditions that cause damage to the optic nerve where it leaves the eye (optic disc). It affects 1 in 50 people over the age of 40. Glaucoma can cause loss of vision.

**Figure 1: side view of the eye**



Your Ophthalmologist will assess you and let you know if glaucoma surgery is suitable for you. However, it is your decision to go ahead with the operation or not.

This document will give you information about the benefits and risks to help you make an informed decision.

### How does glaucoma happen?

Glaucoma can be caused by an increase in pressure in the eye. Fluid (aqueous) is constantly being made in the eye and drains out slowly into the bloodstream. The pressure in the eye can increase if the fluid does not drain properly.

## Aqueous shunt device surgery

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Sometimes the optic nerve can be damaged, even though the pressure in your eye is within the normal range.

Most people do not realise there is a problem in the early stages. This is because it is usually painless, and peripheral (side) vision is usually affected first

### What is an aqueous shunt device or tube?

An aqueous shunt or tube is a tiny device that is used to reduce the pressure inside the eye of people with high eye pressure.

The device is put into the eye with an operation that allows excess aqueous humour (fluid inside the eye) to drain. Your surgeon will place a plate of the tube towards the back of your eye under the eye muscles where it will form the small blister or 'bleb' where the fluid will be drained to. You cannot see the bleb as it is too far back behind your eye to see. By draining away the excess fluid inside the eye, the amount of pressure within the eye is reduced.

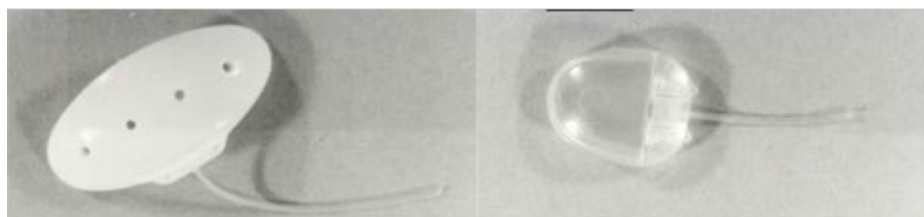
You can't feel the bleb and tube, or the fluid flowing through them.

There are three different shunts available one with a small valve incorporated (Ahmed valve) and another ones without any valves (Baerveldt tube and Paul Glaucoma Implant). Those without any valve will require a stenting stitch (called supramid or prolene) to be placed within the tube to restrict the flow, to avoid hypotony (too low eye pressure). The stenting stitch may have to be removed later on, depending on the postoperative eye pressure control.

#### Baerveldt Tube

#### Ahmed Valve

#### PAUL Glaucoma Implant



## Aqueous shunt device surgery

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### Why do I need to have an aqueous shunt?

Your eye surgeon has recommended a tube operation because:

- medical treatments (drops), or previous surgery have not controlled your condition adequately; and/or
- drop treatment is unsuitable.

In some cases, this may even be the first choice of treatment. Your doctor makes the decision to operate after assessing your condition.

### What are the benefits of surgery?

The aqueous shunt device/tube will reduce the eye pressure, preserving the sight you still have. It will not restore any sight you may have already lost or improve your sight, but aims to prevent further loss of vision.

### Are there any alternatives to surgery?

You can use eye drops to lower the eye pressure. If they are not effective enough, surgery is usually recommended. Laser treatment may be suitable for you but is less effective than surgery and the effect may not last as long.

### What will happen if I decide not to have the operation?

The optic nerve at the back of your eye will be increasingly getting more damaged. If you leave your condition untreated you are likely to lose eye sight. Surgery may blur your vision after the operation which will stabilise after 3 months. Afterwards you may need to see your optician to assess your glasses prescription.

## Aqueous shunt device surgery

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### What does the operation involve?

The tube operation usually takes around one to two hours under a general anaesthetic.

Your surgeon will also insert a small plastic tube (less than 1 mm in diameter) into the front chamber of your eye. It is so small you would need a microscope to see it.

To stop the tube from moving around and becoming exposed through the conjunctiva (skin around the eye), your surgeon will stitch a patch made from donor eye/heart lining to cover the tube.

The donor tissue has been sterilised and prepared according to international guidelines. It has been tested for infections such as:

- Hepatitis B and C
- Syphilis
- HIV.

There is no test for CJD (Mad cow disease) at the moment, but the risk of transmission from transplanted donor tissue appears to be extremely low.

Sometimes the surgeon may use a stenting stitch to stop too much fluid draining during the first few months. This means that your eye pressure could still be high until this stitch has been removed. This can be done in clinic or operating theatre.

The surgeon may apply anti-scarring drugs onto the surface of your eye to improve the chances of the long-term success of the operation.

A variety of anaesthetic techniques are possible, including a general anaesthetic or a local anaesthetic. Your eye surgeon will discuss the options with you.

## Aqueous shunt device surgery

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It is possible that after the operation you may be able to reduce the number of your eye drops.

### **What happens after the operation?**

After the operation, you will have anti-inflammatory/steroid eye drops to reduce too much scarring. You may need to use them very frequently. Your doctor or nurse will give you specific instructions about this.

You may also have to take antibiotic drops. These drops are used to prevent infection following the operation. Your doctor or nurse will give you specific instructions about this, as every patient is different.

You will also need to wear a plastic shield at night for few weeks after the operation. This is to prevent you accidentally rubbing your eye while asleep. You should wash and thoroughly dry the shield before covering your eye each night. You can also wear it during the day if you are concerned.

### **Will I have a follow-up appointment?**

You will have an appointment in the outpatient department the following day to make sure the operation is working well.

In the initial period following the operation we need to regularly see you in our clinic. You will start to visit less often after first four weeks. Your doctor will decide exactly how often you need to be seen, as every patient is different.

You will be instructed about using your glaucoma eye drops after the operation by your doctor/nurse.

If you are using glaucoma drops to the non-operated eye, please continue to use them as usual.

You will have a dressing placed over your eye immediately after your operation. A nurse will remove this when you come in for your outpatient appointment. If you have poor vision in the eye not operated on, you will have

## Aqueous shunt device surgery

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a clear shield instead of a patch over your operated eye so that you can still see and move around after surgery.

As with any operation, the affected part of the eye will take a little time to settle down. It is normal that you may feel that your vision is blurred. This may fluctuate from day to day for some weeks to months.

Once the eye has settled, a visit to your optometrist/optician for new glasses will usually improve your sight to very similar, if not the same, as it was before the operation. Your doctor will inform you when the right time for a glasses check is – usually around three months after the operation.

### What should I do about my medication?

You should make sure your surgeon knows the medication you are on and follow their advice.

You may need to stop taking Aspirin, Warfarin or Clopidogrel (blood thinning tablets) before your operation.

If you are diabetic, it is important that your diabetes is controlled around the time of your operation. Follow your doctor's advice about diabetic medication.

If you take blood pressure tablets, you should continue to take your medication as normal.

### What can I do to help make the operation a success?

#### Keeping in the same position

If your operation is being performed under a local anaesthetic, you will need to lie flat and remain still during the operation. If you cannot lie still and flat, you should let your surgeon know.

## Patient and Carer Information

## Aqueous shunt device surgery

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Your face will be covered with a sterile cloth to allow your surgeon to work on a clean surface. Air will be blown gently towards your nose. If you are claustrophobic you should let your surgeon know.

### Lifestyle changes

If you smoke, stopping smoking several weeks or more before an operation may reduce your chances of getting complications and will improve your long term health.

Try to maintain a healthy weight. You have a higher chance of developing surgical/anaesthetic complications if you are overweight.

Regular exercise should help prepare you for the operation, help with your recovery and improve your long-term health. Before you start exercising, ask a member of the healthcare team or your GP for advice.

### Activity following aqueous shunt/tube operation

You should avoid stooping, bending and strenuous activity during the first four weeks after your operation. You should also avoid swimming and contact sports. However, it is safe to watch TV and read.

If you work, you should arrange to be away from work for approximately two weeks, but this can vary depending on:

- The nature of your employment; and
- Level of vision in your other eye.

You may need more time off if you do heavy manual, or dirty/dusty work.

In the long term, if you plan to travel abroad, you should let your doctor know, as you should take an adequate supply of drops with you. You should check with the eye doctor before travelling.

## Aqueous shunt device surgery

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### What complications can happen?

The healthcare team will try to make your operation as safe as possible. However, complications can happen. Some of these can be serious. You should ask your doctor if there is anything that you do not understand.

Any numbers which relate to risk are from studies of people who have had this operation. Your doctor may be able to tell you if the risk of a complication is higher or lower for you.

Occasionally after the operation, your vision may not be as sharp as before the operation. You may be concerned that your sight seems worse afterwards. However, if your doctor feels you need this operation, it is because he or she feels you are in danger of losing your sight altogether if the glaucoma is not controlled.

Your eyelid position might change after the operation and you may require another operation to correct this later on.

Infection is a complication that can occur after any operation, but serious infection leading to blindness is uncommon.

### **Certain symptoms that occur after the operation could mean that you need prompt treatment, including:**

- excessive pain
- sticky eye that continues to produce sticky discharge after gentle bathing with cooled boiled water
- a sudden or very obvious worsening or darkening of your vision
- shadows, veil or 'spider web' shadow of your vision



## Aqueous shunt device surgery

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- flashing lights
- increasing redness of your eye.

**Contact the hospital immediately** using the numbers at the end of this information leaflet if you have any of these symptoms.

- Very rarely, the eye pressure can drop too low (called hypotony) or fall too quickly. Low eye pressure is the most important risk after the operation. Low eye pressure can result in bleeding at the back of the eye, which is a very severe complication and blindness.
- If your eye pressure is too low, a surgeon may need to inject special gel into the front of your eye. The doctor may also recommend increasing or decreasing certain eye drops.
- Occasionally you may need further operation to fix any issues arising from the initial operation.
- Very rarely bleeding can happen inside the eye after the operation. This may permanently damage your vision.

### 1. Anaesthesia related complication

Your anaesthetist will be able to discuss with you the possible complications of having an anaesthetic.

### 2. General complications of any operation

#### a. Pain

Pain after tube surgery should only be mild and is usually easily treated with simple painkillers such as paracetamol. You may feel pressure or mild

## Patient and Carer Information

## Aqueous shunt device surgery

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discomfort. If you are in severe pain you should let your surgeon know as this is unusual.

b. Bleeding during or after surgery

Any bleeding is usually mild and your eye may be slightly red and bloodshot. If it is red and painful, you should let your surgeon know, as this is unusual.

c. Infection

Can result in blurred vision or even permanent loss of vision (risk 1 in 300). Most infections usually happen in the first week after the operation but can happen later. If your eye becomes red and painful, and your vision becomes blurred, you should let your surgeon know straight away. You may need other procedures to control the infection.

4. Specific complications of this operation

a. Severe bleeding inside the eye (suprachoroidal haemorrhage) during/after surgery which may cause permanent loss of vision

(risk 1 in 2,000).

b. Bleeding in the front chamber of the eye which makes vision worse (risk 1 in 4). This usually settles after few weeks.

c. Inflammation in the other eye (sympathetic ophthalmia) (risk: less than 1 in a million). This is a potentially serious complication which may be treatable. If you develop pain or blurred vision in your other eye, let your surgeon know.

d. Too much fluid draining (risk 1 in 5) from the edge of the surgical site. This usually settles on its own. A tight eye pad or contact lens may be used. If it does not settle you may need a further operation.

e. Sharp rise in eye pressure causing sickness, pain and headaches (risk 1 in 600).

5. Late complications of this operation

## Aqueous shunt device surgery

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- a. Developing cataract (lens becomes cloudy).
- b. Reduced vision over time (risk 1 in 10). This is caused by deterioration of glaucoma.
- c. Tube exposure which may cause with infection and therefore has to be treated surgically.
- d. Tube blockage/too much scarring
- e. You may need eye drops or further treatment/surgery to control the pressure.

### How soon will I recover?

#### In hospital

After the operation (if it was done under general anaesthesia) you will be transferred to the recovery area and then to the ward or day-case unit. You should be able to go home a few hours after the operation once you have come around alright after anaesthesia is worn off. A responsible adult should take you home in a car or taxi and stay with you for at least 24 hours. You should be near a telephone in case of an emergency.

Your surgeon will need to check your eye the day after the operation. Your surgeon may inject anti-scarring drugs into the surface of the eye, and scrape away any scar tissue. These procedures are well tolerated by patients and are performed after your eye has been numbed adequately.

If you are worried about anything, in hospital or at home, contact a member of the healthcare team. They should be able to reassure you or identify and treat any complications.

#### Returning to normal activities

## Patient and Carer Information

## Aqueous shunt device surgery

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You should not drive, operate machinery (this includes cooking) or do any potentially dangerous activities for at least 24 hours. If you had a general anaesthetic or sedation, you should also not sign any legal documents or drink alcohol for 24 hours.

Your surgeon will tell you when you can return to normal activities. Most people will need about two weeks off work.

For the first four to six weeks it is best to avoid activities such as swimming/contact sports that will expose your eye to infection.

It is important to look after your eye very meticulously to reduce the risk of complications.

Regular exercise should help you return to normal activities as soon as possible.

Before you start exercising, you should ask a member of the healthcare team or your GP for advice.

Do not drive until you can read a number plate from 20.5 metres (67 feet) and always check with your surgeon and insurance company first.

The future

Most people make a good recovery from the operation, with their glaucoma under better control.

### Summary

- Glaucoma is a common problem, causing damage to the optic nerve where it leaves the eye.
- It usually affects people over the age of 40.

## Aqueous shunt device surgery

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- If eye drops do not help enough, glaucoma surgery can be performed to stop further damage to the optic nerve. If traditional glaucoma surgery (trabeculectomy) has failed to work or deemed inappropriate, aqueous shunt device implantation may be offered.
- Surgery is usually safe and effective. However, complications can happen. You need to know about them to help you make an informed choice about surgery. Knowing about them will also help to detect and treat any problems early.

This document is intended for information purposes only and should not replace advice that your relevant health professional would give you.

**Eye Clinic Triage: 01423 542217 / 553195 Mon-Fri 9-5**

**Appointments: 01423 553373**

This document is intended for information purposes only and should not replace advice that your relevant health professional would give you.

If you require this information in an alternative language or format (such as Braille, audiotape or large print), please ask the staff who are looking after you.