

Corneal graft

Transplanting the cornea in your eye

You have been given this leaflet because your ophthalmologist (doctor specialising in conditions affecting the eyes) believes that you require an operation called a corneal graft to improve your eyesight. This leaflet explains what a corneal graft involves, as well as the risks and benefits of the procedure. If you have any further questions or concerns, please speak to a doctor or nurse caring for you.

What is the cornea?

The cornea is the transparent dome at the front of the eye through which the iris (the coloured part of the eye) and the pupil (the black hole in the centre of the eye) can be seen.

The cornea is responsible for most of the focusing power of the eye. It has to be clear, smooth and regularly-shaped in order for you to see clearly. If your cornea is

deformed, damaged, hazy or scarred, you will have problems seeing.

What is a corneal graft?

A corneal graft or transplant is an operation in which part, or all, of your cornea is removed and replaced with healthy corneal tissue from a person who has died and donated their cornea for transplantation. Either the donor (prior to death) or his/her family will have given their permission for the donation to take place.

Donated corneas are stored in an **eye bank** before being sent to hospitals for transplants. The eye bank carries out a number of tests to check that the cornea is healthy and suitable for transplant. These tests also make sure that you will not catch any infections (such as HIV or Hepatitis C) from the new cornea.

Why do people have corneal grafts?

The most common reason for performing a corneal graft is to help patients to see more clearly.

Occasionally the operation may be done to help reduce chronic eye pain or to save the eye if there is an ulcer or trauma which has perforated (ruptured) the cornea or is threatening to perforate it.

What are the risks?

Aside from the risks associated with any surgical procedure, there are some risks that are specific to corneal graft that you need to be aware of. The team at Guy's and St Thomas' is very experienced in this procedure and will work with you to achieve the best possible results from your surgery.

It is normal to be anxious. If you have any questions or concerns about the procedure, you will have time at your pre-assessment appointment to discuss these with your surgeon.

Early problems (in the days/weeks after surgery)

Minor complications include:

- **leaks of fluid between stitches** (these usually settle on their own, but may require extra stitches or a special type of contact lens which works like a bandage)
- raised eye pressure, which can be treated with eye drops.

Major complications after corneal grafting are rare, but early infections and bleeding within the eye can result in loss of sight/blindness. Further surgery may be required to save the eye.

Delayed complications (occurring weeks, months or years after surgery)

There are a number of delayed complications that may occur. These include:

1. Rejection

There is a danger that the corneal transplant will be rejected. This happens when your immune system recognises the donor cornea as foreign and tries to attack it. The quicker a rejection episode is diagnosed and treated, the better the chance of recovery. Most rejection episodes occur in the first year after surgery, but they can occur at any time, even many years later.

It is very important that you are aware of the signs of rejection. If you have one or more of the following symptoms, contact your eye surgeon immediately:

- a decrease in sight
- redness of the eye
- pain.

Rejection is treated with steroid eye drops and occasionally steroid tablets or injections. These may need to be continued for many months and occasionally, permanent steroid eye drops are required.

About one in seven patients who have a corneal graft will have an episode of rejection. Some patients are at

greater risk than others due to other eye conditions they may have.

2. Water-logging of the cornea due to failure of the endothelium

In order to maintain its transparency the normal cornea is kept in a dehydrated (dry) state by a single layer of cells on the surface of the cornea, called endothelial cells.

Endothelial cells do not re-grow, so if your donated cornea has very few endothelial cells, if there was a loss of your endothelial cells due to a surgical complication, or if the cells failed with time, the cornea could become waterlogged and hazy.

Symptoms of endothelial cell failure include:

- blurred vision (especially in the morning on waking)
- the appearance of coloured halos seen around lights
- eye irritation.

If you experience these symptoms, please contact your eye surgeon. It is possible that we will need to repeat the corneal graft.

3. Recurrence of the original disease

If your corneal graft was done because of a genetic disease, such as a corneal dystrophy or keratoconus, or an infection, such as the herpes virus, there is always a possibility that the original disease could occur again in your new cornea.

4. Cataracts

Eye surgery and the long-term use of steroid eye drops can sometimes cause you to develop cataracts (a clouding of the lens within the eye). This may require further surgery if your vision is reduced. Cataract surgery is amongst the most successful of all surgical procedures.

5. Astigmatism

Astigmatism is a very common eye condition where the cornea is curved in an asymmetrical (irregular) way. Some degree of astigmatism is very likely after corneal grafting. It causes your vision to be slightly irregular, so that you have difficulty focusing. It can be corrected with regular glasses, but occasionally requires contact lenses if the astigmatism is of a high degree or if you are also long- or short-sighted.

If you experience astigmatism, we may adjust or remove some of the stitches in your cornea during the first months after surgery.

In some cases, a corneal graft can result in very severe astigmatism. If contact lenses are unable to correct this or cannot be worn, a further operation may be needed to improve the shape and focusing of the cornea. This procedure involves peripheral cuts (astigmatic keratotomies), re-stitching and laser surgery to correct your vision.

Are there any alternatives?

Your doctor will have suggested a number of treatments for your corneal problems before considering surgery. This may have included eye drops, medication, glasses or contact lenses. If none of these are effective in improving your eyesight, your doctor will discuss the possibility of a corneal graft.

Asking for your consent

We want to involve you in all the decisions about your care and treatment. If you decide to go ahead with a corneal graft, you will be asked to sign a consent form. This confirms that you agree to have the procedure and understand what it involves. You should have received the leaflet, **Helping you decide: our consent policy**, which gives you more information. If you do not have a copy, please ask us for one.

What do I need to do before surgery?

We will send you information about how to prepare for your hospital stay with your admission letter. Please read this information carefully.

We will also send you information about fasting. Fasting means that you cannot eat or drink anything (except water) for six hours before surgery. We will give you clear instructions on whether you need to fast and on when to start fasting. It is important that you follow these instructions. If there is food or liquid in your stomach

during the anaesthetic, it could come up to the back of your throat and damage your lungs.

Please bring all of your medications, including prescription medications, medication you have bought for yourself and alternative medicines, such as herbal remedies, so that we know what you are taking. Unless your doctor or nurse tells you otherwise, please take your tablets as prescribed, with a small sip of water, on the day of your surgery.

You will be given further instructions if you are taking any of the following medicines:

- **Diabetes medicines, including oral anti-diabetic drugs and insulin** – you will be given additional information about your diabetes treatment, so please discuss this with the member of staff caring for you.
- **Warfarin** – you do not usually need to stop your warfarin before your surgery, but this will depend on your INR (international normalised ratio). You should check this with your doctor, especially if you have had a heart valve operation, recurrent deep vein thrombosis (DVT) or pulmonary embolism. Your eye doctor will discuss what you need to do with any other blood thinning tablets you may be taking.

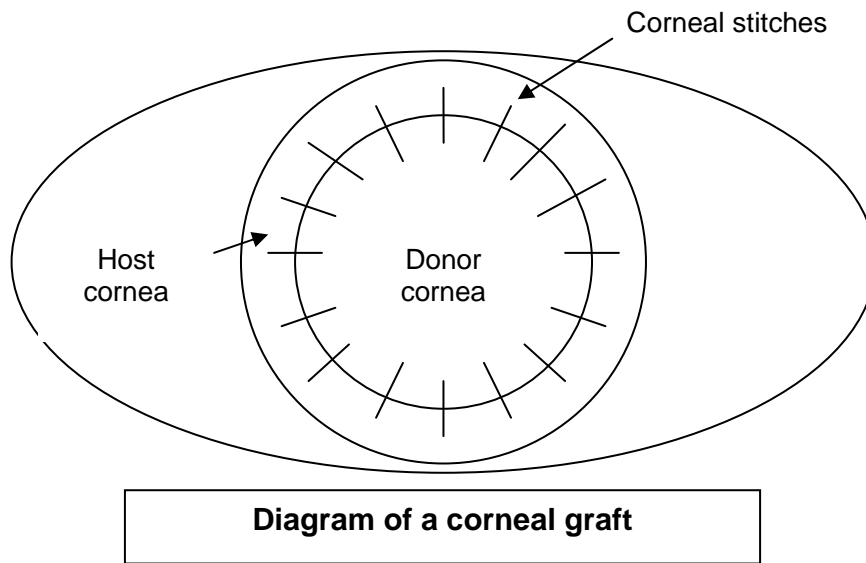
What happens during the corneal graft operation?

The operation is normally performed under a general anaesthetic. This means that you will be asleep for the entire procedure, and will not feel anything during the surgery. A specially trained doctor, called an anaesthetist, will stay with you and monitor your care during the surgery. You may need to have tests, including a blood test, to ensure that you are in good health for the general anaesthetic.

You might find the leaflet, **Having an anaesthetic**, useful. Please ask your doctor or nurse for a copy if you do not already have one.

A corneal graft usually takes between one and two hours. During the operation, the eye surgeon will remove a circular portion from the centre of the cornea and replace it with a similarly-sized circular area from the donor's cornea. This is then fixed in place with very fine stitches (sutures). The surgery is performed with the help of a microscope.

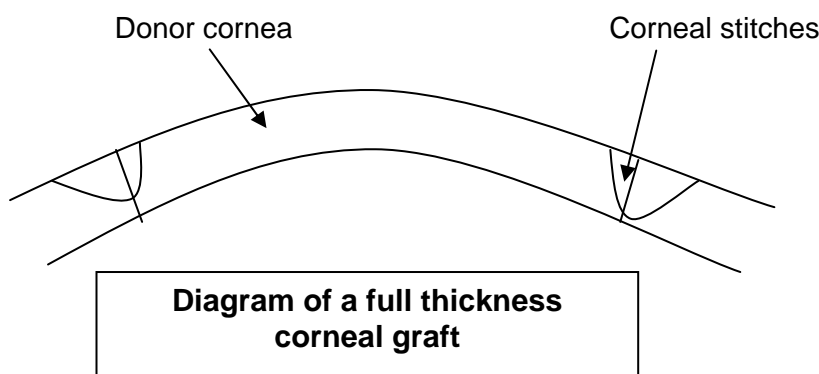
In some cases, other procedures such as cataract extractions and glaucoma operations may be done at the same time. The diseased part of the cornea that has been removed is occasionally sent to laboratory for examination under a microscope.



There are two key types of corneal graft operations:

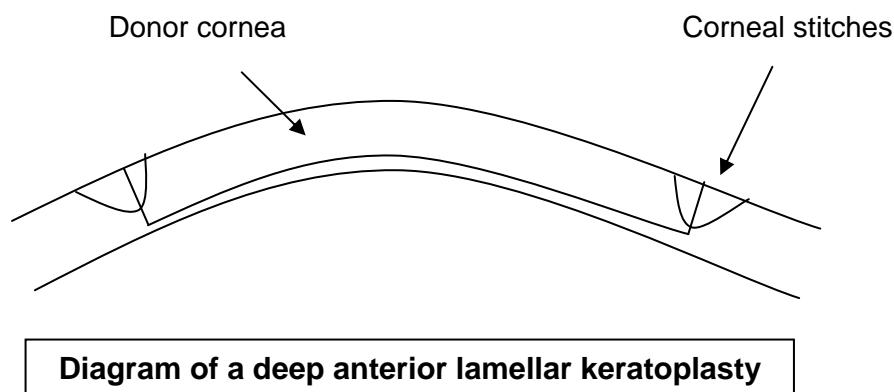
- Penetrating or full thickness corneal graft
- Lamellar or partial thickness corneal graft

A penetrating or full thickness corneal graft involves removing the whole of the central diseased cornea.



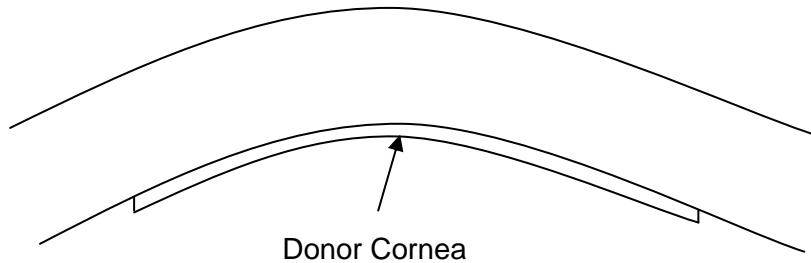
A lamellar or partial thickness graft replaces part rather than all of the thickness of the cornea. How this is done will depend on the extent of disease in the eye.

If only the anterior (front) part of the cornea is diseased, with the deeper layers remaining healthy, the surgeon will only remove and replace the diseased anterior part of the cornea. This is called a **deep anterior lamellar keratoplasty**. Although this type of surgery is generally more difficult to perform, the risk of rejection is less likely and fewer steroid drops may be needed after the surgery. The eye also retains some of its structural strength and is less vulnerable to injury.



If the anterior layers of the cornea are healthy, but the deep layers are diseased, the surgeon will replace the deeper layers without removing the healthy anterior layers. This procedure is called a **deep endothelial lamellar keratoplasty**. Because this type of transplant requires no stitches to keep it in place, most patients experience a much quicker recovery time and are less likely to suffer astigmatism as a result of the surgery.

Diagram of a deep endothelial lamellar keratoplasty



What happens after the operation?

Following the operation, your eye may be sore. When you wake up, your eye will be padded with a plastic protective shield taped over it. This is normally removed 12–24 hours after the surgery, and before you leave the hospital.

You will most likely stay in the hospital overnight. Your ophthalmologist will examine you the next day to ensure the operation was successful. You may be able to go home the day after your operation, or you may need to stay in hospital for a couple of days.

How do I care for my eye after the surgery?

Pain is unusual after corneal graft surgery, although the eye can be very irritable for a number of days. Typically, the eye is only padded for the first 12–24 hours after surgery, however, you will be asked to wear a plastic

shield over the eye at night for one week following your operation.

Your vision will probably be blurred for the first few weeks and months after surgery as the cornea heals and settles slowly. However, an improvement in vision is often noted even during the first few days or weeks.

Usually your vision changes during the first six to nine months after surgery. New glasses are not usually prescribed during this time. It is important to remember that your eye will never be as strong as a normal eye.

You will be given two types of eye drops to use after the surgery. You should not stop using them without consulting your eye surgeon.

The first are antibiotic eye drops, which are prescribed to prevent infection and are usually only used for one to two weeks.

The second are steroid preparations, which are used to reduce inflammation and reduce the risk of your body rejecting the new cornea. These will need to be used for several months. If the risk of rejection of the transplanted cornea is high, you may be given steroid eye drops on a long-term basis.

The steroid eye-drops will have to be used very intensively – every one to two hours initially, but less frequently over the following months.

If your doctor feels that you have a high risk of corneal graft rejection, he or she may advise you to take steroid tablets and other medicines to suppress your immune system. While taking steroid medications, it is especially important to attend all of your appointments for monitoring, as steroid tablets can raise pressure within the eye and cause damage to the nerve at the back of the eye, resulting in loss of sight. At your appointments your doctor will closely monitor your eye pressure to reduce this risk.

How often will I need check-ups after the surgery?

If your surgery is straightforward, you can expect to attend a clinic at the hospital seven or eight times in the first year following your corneal graft.

The stitches are usually removed one or two years after the operation. After this has happened, glasses or contact lenses can be prescribed to help your vision. If necessary, other surgical procedures can be performed to reduce any focusing (refractive) problems you may be experiencing.

When can I return to my normal activities?

During the first weeks after surgery your eye is very fragile and care should be taken to avoid strenuous exercise or heavy lifting.

If you have a sedentary (office) job, you can go back to work two or three weeks after the surgery. However, if you have a more strenuous job, you should allow at least four to six weeks to pass before returning to work.

If you play racket or minor contact sports, such as football or tennis, you should wear eye protection whilst playing after your operation.

You should not take part in major contact sports such as rugby, boxing and martial arts. If you have any questions about how to protect your eye, please speak with the doctors or nurses looking after you.

What should I do if there are any problems?

Your eye will feel sensitive and may be uncomfortable after the operation. If you are in serious pain at any time, or the discomfort continues for more than three days, please seek medical advice from your GP. You can also contact the nurses in the **Iris Clinic** at St Thomas' Hospital on **020 7188 4307**.

Contact us

If you have any questions or concerns about your corneal graft operation, please contact the secretary for the Corneal Service on 020 7188 4331 (Monday to Friday, 9am to 5pm).

For more information leaflets on conditions, procedures, treatments and services offered at our hospitals, please visit
www.guysandstthomas.nhs.uk/leaflets

Royal National Institute for the Blind (RNIB) is a charity offering information on many different eye conditions. RNIB can also provide information in large print or in audio formats.

t: 0845 766 9999 **e:** helpline@rnib.org.uk

w: www.rnib.org.uk

Corneal Transplant Service Eye Bank Bristol has a website with some further information about their services.

w: <http://www.bris.ac.uk/ophthalmology/tissuebanking/eyebank.html>

Pharmacy Medicines Helpline

If you have any questions or concerns about your medicines, please speak to the staff caring for you or call our helpline.

t: 020 7188 8748 9am to 5pm, Monday to Friday