

Information for patients
Cataract Surgery

Summary:

The vast majority of patients who undergo cataract surgery experience a significant improvement in vision following the operation.

However, no operation is guaranteed and unfortunately, things can go wrong.

It is therefore important that you understand the following:-

- **95% [19 out of 20] of people experience a significant improvement in their vision after their operation.**
- **4% [1 in 25] of people do not notice much change in their vision after their operation.**
- **1% [1 in 100] of people feel that their vision is worse after the operation.**
- **If the operation does not go to plan, you may need further operations.**
- **In the worst case, you may lose all vision from the eye and even the eye itself. However, the risks of this happening are very small.**

The remainder of this leaflet explains more about cataract surgery and what to expect afterwards.

There is also a more detailed explanation of possible complications which you are encouraged to read.

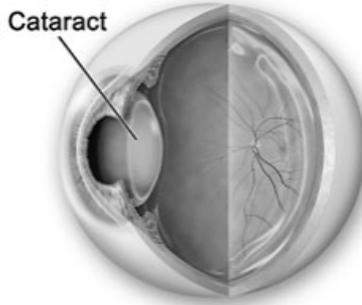
Cataract surgery

This leaflet provides information that will help you decide whether or not to have cataract surgery. You might want to discuss it with a relative or carer. Before you have the operation, you will be asked to sign a consent form so it is important that you understand this leaflet before you decide to have surgery. If you have any questions, you may wish to write them down so that you can ask one of the hospital staff or your eye surgeon.

What is a cataract?

One way to understand what a cataract is to think of your eye as a camera. The lens of the camera focuses the image on the film (or electronic receiver in digital cameras) and the image formed is then interpreted by your brain allowing you to see. There are 2 structures in your eye that act as the lens of the camera and one, the retina which acts as the film or receiver.

The front lens of your eye is the cornea. This covers your iris (the coloured part) and your pupil. The cornea is fixed and usually lasts a lifetime. However, the second structure which makes up the "lens" of your eye is located inside the eye behind your iris and pupil, and it is this structure which we call the crystalline lens, in which cataract occurs. In simple terms this lens starts to malfunction and scatter light rather than focusing it cleanly - this is why you are aware that your vision has deteriorated.



What to do about the cataract?

Many people worry that the diagnosis of cataract means that they require an operation. This is not the case as not all cataracts require an operation.

However, your eye doctor has suggested that cataract surgery may be of benefit to you and that your vision should be improved by the surgery.

The decision whether or not to have an operation is yours. If your vision is causing you to experience difficulties carrying out your usual daily activities then it is very reasonable to consider cataract surgery. The sorts of difficulties which people experience vary greatly, as do different people's vision requirements e.g. driving. Any decision about the surgery must be yours.

If your cataract is not removed, your vision will probably get worse over time, although it is not possible to predict how quickly this will occur. Waiting until your cataract becomes more advanced does not usually affect either the type of operation or the outcome of the surgery, unless your eyesight becomes so poor that all you can see is light and dark.

The cataract operation

A cataract extraction / operation involves removing and replacing the cataractous lens inside your eye with an appropriate clear plastic lens implant.

Example of an
intra-ocular lens
implant



Most people have a local anaesthetic and are awake during the operation which normally takes about 20 minutes, but which may take longer in some cases.

Before the operation, your pupil will be dilated with eye drops. When you are in the operating theatre area you will be given an anaesthetic to numb your eye. Today many operations are performed using local anaesthetic eye-drops on their own, however, occasionally a small injection of anaesthetic into the tissues around your eye is also required - this may be a little uncomfortable but is usually not painful. Your surgeon will explain this to you.

Whilst the anaesthetic eye-drops will prevent your eye from feeling pain, they will not stop the eye or the eyelids from moving, nor will they prevent the eye from seeing.

After receiving the anaesthetic you will be transferred to the operating room and onto the operating table, which is similar to a firm couch with a rest for your head and a pillow is placed under your knees to make you comfortable. The surgeon will then use a disinfectant solution to clean around your eye. A plastic drape is then stuck around the eye and this comes off your nose up to a bar under which fresh air and

oxygen is circulated. The drape separates you from the surgeon during the operation and keeps the operating field clean.

A small slit is then made in the plastic drape and a special clip called a speculum is used to keep your eyelids open - you do not need to worry about holding your eyes open, this is done for you. The clip might feel a little strange but is usually quite comfortable. You can close or open your other eye as you want.

During the operation (normally about 20 minutes) you will need to lie approximately flat and keep your head and eyes as still as you can. You will be asked to look straight ahead towards the bright light(s) of the operating microscope, located about 1 foot in front of your eye, and to keep your eye still. This may be a little uncomfortable at first but is not harmful and you will soon get used to the light. A nurse will usually hold your hand during the operation to make sure that you are all right.

During the operation you will be aware of the surgeon's movements, hands resting on your head, and staff talking. You will not be able to see clearly what is happening. You will probably notice the microscope light moving periodically and you will be aware of shadows, reflections, glinting lights, swirling motions and colours. These are all normal and to be expected.

Although you should not feel any pain during the operation, there will be a time when you feel a little ache and you will probably be aware of the feeling of pressure in your eye at times. Some people find this feeling a little uncomfortable, however, most do not find this to be a problem.

If you are unhappy in any way, at any stage, you can let the surgeon know by squeezing the hand of the nurse. The surgeon will then stop and check you are okay. If you are not happy the surgeon may offer to give you a small injection of anaesthetic just below your eye.

Most cataracts are removed by a technique called phacoemulsification (a type of ultrasound). During the operation the surgeon makes a very small cut in the front of your eye and then softens and breaks up your cataract with high frequency sound waves from the phacoemulsification machine. The pieces of broken up cataract are continuously removed through a small tube. The capsular layer of your lens is left behind and a plastic artificial lens implant is inserted to replace the original focusing power of your crystalline lens. Occasionally a small stitch is placed in the incision at the end of the operation.

After the operation is completed, a pad or shield is placed over your eye to protect it.

After the operation

If you have discomfort, you should take a pain reliever such as paracetamol every 4-6 hours, however, such discomfort is usually minimal. It is normal to feel a little irritation, such as picking sensation, following your operation - this may last a few days but can sometimes persist longer. It is also normal for the eye to be a little sticky at times and it may need to be bathed open with **cooled** boiled water from the kettle and a little cotton wool in the morning for the first few days.

When you leave the hospital you will be provided with a 4 week reducing course of eye drops to instill in your eye to reduce inflammation. The hospital staff will explain how and when to use them. Please don't rub your eye.

In most cases, healing is complete by about 4 weeks after which new glasses can be prescribed by your optician.

Certain symptoms could mean that you need prompt assessment. Please contact the hospital and/or your surgeon immediately if you have any of the following symptoms:

- Excessive pain
- Loss of vision
- Increasing redness of the eye

Likelihood of better vision

The vast majority of patients have improved eyesight following cataract surgery.

After your operation you may read or watch TV almost straight away, but your vision may be blurred and you may ultimately require new glasses to see well. The healing eye needs time to settle and adjust. Depending upon the intended outcome, your eye may see better for near or for distance but will probably still require glasses to get the best vision.

If you have another condition which affects the eyes, such as diabetes, glaucoma or age-related macular degeneration, the quality of your vision may still be limited, even after successful surgery. Your surgeon will explain this likelihood to you before you decide whether or not to have surgery.

The Benefits of cataract surgery

The most obvious benefits of surgery is greater clarity of vision and improved colour vision. The intra-ocular lens implants are usually selected to compensate for existing focusing problems (spectacle errors) and most people find that their eyesight improves considerably after surgery however they will need to

replace their glasses to obtain the best vision. If you are under 45 years of age you should be aware that you will lose your ability to focus from distant objects to those that are near to you and you may require reading glasses. If you are over 45 years you are less likely to notice this change.

In a survey of cataract operations performed in the NHS in the UK in 1997-8 the visual outcomes showed that 92% [about 9 out of 10] of eyes without any other eye disease and 77% [about 8 out of 10] of those eyes with other eye diseases, achieved a vision of at least 6/12 [this level of vision may enable you to drive again].

Increasing age, the presence of other eye diseases, poor general health and very poor vision before the operation are associated with slightly poorer final visual outcomes with only 50% [1 out of 2] achieving a final vision of 6/12.

The Risks associated with cataract surgery

You should be aware that there is a small risk of complications occurring either during or after your operation.

Some possible complications during the operation

- Tearing of the back part of the lens capsule with disturbance of the gel inside the eye that may sometimes result in reduced vision - this occurs in approximately 2% [1 out of 50] of cataract operations.
- Loss of all or part of the cataract into the back of the eye requiring a further operation which may require a general anaesthetic - this occurs in approximately 0.3% [1 out of 300] of cataract operations.
- Bleeding inside the eye - minor bleeding occurs in approximately 0.5% [1 out of 200] whilst major bleeding occurs in approximately 0.1% [1 out of 1000] of cataract operations.
- Damage to the eye may result in a permanent cosmetic disfigurement e.g. a pupil which is not round and which does not change size.

Some possible complications after the operation

- Bruising of the eye or eyelids - quite common when an injection of anaesthetic is used
- Allergy to the medication, disinfecting solutions used.

- Clouding of the cornea - this occurs following approximately 10% [1 out of 10] of cataract operations, is usually settles after a few days, but can rarely persist and require further surgery..

- High pressure inside the eye - this occurs following approximately 10% [1 out of 10] of cataract operations and is usually transient and easily treated

- Greater than expected inflammation within the eye - this occurs following approximately 6% [1 out of 17] of cataract operations and is usually transient and easily treated.

- Swelling of the retina - macular oedema. This occurs in approximately 5% [1 out of 20] of cataract operations. It is usually transient but may take some months to settle and may require further treatment (usually drops).

- Double vision due to eye muscle damage usually from the anaesthetic injection (if used). This occurs in approximately 0.2% [1 out of 500] of cataract operations and whilst it usually settles, rarely further treatment may be required.

- Detached retina which can lead to loss of sight - this occurs following approximately 0.2% [1 out of 500] of cataract operations. The risk of retinal detachment increases if you are very shortsighted or if you have had a previous retinal detachment. Further surgery will be required.

- Infection in the eye [endophthalmitis] - which can lead to loss of sight or even the eye - this occurs following approximately 0.1% [1 out of 1000] of cataract operations. Further surgery / treatments will be required.

- Incorrect strength or dislocation of the implant. This may require further surgery.

There is a very small risk [1 out of 14,000 – 1,000,000] that the sight in the non-operated eye can be damaged following the operation by an inflammatory reaction.

Overall the complications are rare and most can be treated effectively. In a small proportion of cases, further surgery may be required and very rarely complications can result in blindness.

Long term complications after the operation

Posterior capsule opacification - this usually comes on gradually after many months or years as the back part of the lens capsule, which was left in the eye to support the plastic lens implant, becomes cloudy. This may interfere with the light reaching the back of your eye and your vision can become misty and foggy

again. Unfortunately this complication may occur in 10-15% [upto 1 out of 7] of patients over a 2-3 year period. However, it can be easily treated with a laser which is used to make a small permanent opening in the cloudy membrane. The laser treatment is a painless outpatient procedure which normally takes only a few minutes.

Despite all these statements the risks associated with cataract surgery are small and vision is restored to a very satisfactory level in the vast majority of people.

Expectations following cataract surgery

Spectacle requirements

The usual objective of cataract surgery is to leave your eyes approximately normal sighted for distance. However, despite this objective, the nature of the measurements, calculations and the surgery mean that the optical outcome is not completely precise. You therefore need to expect to wear glasses to obtain best vision at all distances, including distance vision. Without correct glasses you may be aware that your vision is a little blurry, ghosted or doubled – effects which may vary with viewing distance.

However, despite these uncertainties some people (perhaps 1 in 10) may find that they can perform many of the tasks of daily living without glasses but it remains important that you understand that this will be more the exception than the rule.

“Floaters” and “clouds” wafting in front of your vision following surgery

Some people will notice “floaters” or “clouds” wafting in front of their vision for the first time, or will notice that existing “floaters” or “clouds” are more obvious following cataract surgery. This is because the new clear lens placed in the eye at the time of surgery improves the contrast of the image on your retina (the film of the camera) at the back of your eye. This means that edges and shadows are more distinct and that any opacities in the jelly which occupies the inside of your eye (and which are quite common) may become more noticeable to you. These “floaters” and “clouds” are usually nothing to worry about and usually become less intrusive with time. If however, these “floaters” and “clouds” are completely new to you and are accompanied by flashing lights or other visual disturbances you should arrange to see your optometrist urgently or contact your ophthalmologist for advice.

Peculiar / unexpected optical effects of cataract surgery = dysphotopsias:

The development of smaller, high refractive index, “sharp-edged” intra-ocular lenses - the lenses that are placed in your eye during cataract surgery to replace your cataractous lens - has resulted in some patients being aware of optical effects following their surgery that they had not anticipated.

These effects include, but are not limited to the following:

- Awareness of unexplained glints / lights
- Awareness of unexplained edges
- Awareness of unexplained shadows
- Awareness of unexplained lines

Please note:

Most of these effects are noted in the peripheral vision on the opposite side from the nose.

These effects are usually accompanied by otherwise good vision.

Most people are not too troubled by these effects and in time get used to them and forget about them. Some of these effects are also thought to resolve as the eye’s tissues grow to support the intra-ocular lens.

However, these effects can initially be a little disconcerting and some patients worry and require a reassurance that all is well. If having read this information you remain concerned about your vision please contact your optometrist or your ophthalmologist for advice.

Watery eyes

It is quite common for your eye to water following your cataract operation. Watery eye symptoms often seem to occur as the post-operative eyedrops are tapered. The watering is nothing to worry about and usually settles over a period of a few months but occasionally it can persist. We are not sure why eyes water following cataract surgery but there are several possible explanations including;

- The eye may behave as if it is a little “dry” after your operation due to the division of some corneal (cornea = clear membrane over the front of the eye) nerves at the time of surgery. Paradoxically this “dryness” may cause a little watering.
- Your post-operative eye-drops are used to reduce inflammation. One effect of this is to make the surface of your eye more “comfortable”. Therefore, as the eye-drops are tapered your eye returns to its usual state and the eye may respond by watering a little for a while.

- Blocked tear drainage passages – this is likely to be incidental and unrelated to your surgery. It is not uncommon for this to occur with increasing age. Usually if a blockage is the cause of your symptoms they will not improve with time.
- It is possible having had an operation upon your eye that you are a little more conscious of the eye and notice changes that you may not otherwise have attributed to anything in particular.
- Allergy. It is possible to develop an allergy or intolerance to your post-operative eye-drops. Should this occur your eye is likely to become red, sore and may itch. Instilling the eye-drops frequently results in more than trivial discomfort. Should this be the case please contact your ophthalmologist or the hospital for advice.

Treatment: Whilst the watering usually settles and become less troublesome with time, some people find the instillation of an artificial tear eye-drop beneficial. These are available over the counter in supermarkets, chemists and opticians and can be used as often or infrequently as required and for as long as required.

Note: There are many reasons why an eye can start watering most of which are unrelated to cataract surgery. If your eye continues to water and this troubles you, or you notice a lump just below the inner corner of your eye, please contact your GP or optometrist for assessment and referral.

The following information is provided for patients who have previously undergone laser or surgical corneal refractive surgery including: LASIK, LASEK, PRK and keratomies.

The cornea is the first and most powerful refractive element of the eye. Laser or surgical corneal refractive surgery seeks to alter the power (shape) of the cornea, usually permanently, in order to reduce dependence upon spectacles or contact lenses.

This alteration of the corneal power has implications for cataract surgery because measurement of the central corneal power is an important determinant of the power of the lens to be implanted when the cataract has been removed. Previous laser or surgical corneal refractive surgery makes this measurement less reliable and therefore the calculation of the lens implant power is prone to greater errors.

This means that patients who have had laser or surgical corneal refractive surgery are more likely to require glasses, and more likely to require stronger glasses, than those who have not undergone such procedures. Whilst many methods have been developed to try to eliminate these inaccuracies there is as yet no perfect solution.

In addition to the difficulties in determining the power of lens to be inserted at the time of cataract surgery, laser or surgical corneal refractive surgery may also induce optical aberrations (imperfections). Whilst these imperfections may not be noticeable to everyone, some patients may complain of glare (e.g. difficulty seeing in brightly lit environments), poor contrast (e.g. a washed-out image) and other distortions and optical effects (e.g. star-bursts, halos around lights). Unfortunately these effects will not be corrected by cataract surgery and they may become more noticeable afterwards. Addressing such problems can be very difficult and most who experience these effects will need to learn to adapt to them.

Please note that some types of refractive surgery may not involve a permanent alteration of the shape of the cornea, and may not be subject to the problems described above. Please ask your ophthalmologist for clarification.

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Additional information

Intra-ocular lenses (lens implants)



The power of the lens to be implanted in your eye is determined by your surgeon before the operation. The power is calculated by taking measurements of your eye and using a mathematical formula. Unfortunately the power calculated can only be an estimate or "best guess" of the lens power needed and therefore some error is to be expected. This is the reason why you are likely to require new glasses for both near and distance to get the very best vision that you can following your operation. However, many people find that they can cope without any glasses for some and sometimes many viewing tasks.

The larger your spectacle requirement before your operation i.e. the more short or long sighted that you are, the less predictable the implant calculations are. If you have a large spectacle requirement before your operation you are more likely to require glasses for both near and distance tasks.

In addition if you have astigmatism before your operation you are likely to require glasses for both near and distance tasks as cataract surgery does not normally correct astigmatism.

It is also important to understand that the implant calculations are much less accurate if you have had previous eye surgery including corneal, retinal and laser refractive surgery.

Refractive outcome options

Within the limitations described above, the power of the lens implant placed in your eye can be chosen to leave your eye as normal sighted as possible for distance viewing or for near viewing [reading]. The choice is yours:

Most people have their eyesight corrected, as far as is possible, for distance viewing. This is normal practice. As such, reading glasses of some form will usually be required.

Some people who have a very specific requirement for near vision may elect to have their eyesight corrected, as far as is possible, for near viewing. As such distance glasses will usually be required.

Some people decide to have one eye corrected for distance viewing and the other for near viewing in an attempt to be independent of spectacles altogether - this is called **monovision** (see below). Whilst this is a reasonable option if there is little or no pre-operative astigmatism, to get the very best vision, spectacles

are still likely to be required. Monovision may take some getting used to and is probably best considered for those who have previous experience monovision with glasses or contact lenses.

Types of Intra-ocular lenses (lens implants)

When a cataract is removed, it is replaced with an artificial intra-ocular lens (IOL). There are a variety of IOLs that can be used in cataract surgery, and they each have their own advantages and disadvantages. No single IOL works best for everyone. The following information outlines some of the choices of IOLs that are available for use in cataract surgery.

1 - Fixed Focus Monofocal IOLs

These are used in the majority of cataract operations. These lenses have a single fixed focal point and have the advantage of being able to provide excellent quality vision under a variety of lighting conditions. When set for distance vision (as is usually the case), reading glasses are typically, but not always, required for good near vision. For patients willing to use reading glasses for near tasks, these IOLs are an excellent choice. Several million lenses of this variety have been used for decades with an excellent safety record and designs are very refined.

2 - Multifocal IOLs

These IOLs use a different strategy to achieve good distance and near vision without glasses. They have specialized optical properties that can divide light to bring it into focus at more than one point at the same time. This allows the eye to see both near and far, usually without glasses. However, this optical compromise means that multifocal IOLs can produce glare and halo effects and they reduce image contrast (the difference between light and dark features). These effects are usually most noticeable at night, so those wishing to drive at night may wish to consider a different IOL. On occasion these effects are so intolerable that the multifocal IOL may need to be replaced by monofocal IOL - this means a further operation and is not without risk.

Studies have shown that upto 80% of people who receive multifocal IOLs do not use glasses after their cataract surgery. However, it is important to understand that **you cannot be certain** of seeing well without glasses or contact lenses after cataract surgery, even if your eyes have received multifocal IOLs. Some of the factors that can decrease satisfaction with multifocal IOLs include pre-existing astigmatism, incorrect positioning of the IOLs in the eye, glare and night-time halo effects, and reduce image contrast.

3 - Monovision with monofocal IOLs

If your cataract surgery involves both eyes, you might consider monovision. This involves implanting an IOL in one eye that provides near vision and an IOL in the other eye that provides distance vision. Usually people can adapt to this, but some cannot and they may experience blurred vision at both near and distant viewing. In addition, perception of depth may be decreased because of reduced binocular interaction.

The people who do best with this method are those who are already used to monovision with contact lenses - a common way of correcting presbyopia (loss of near focus with aging).

4 - Toric IOLs for Astigmatism

Toric IOLs are designed to correct / reduce visually significant astigmatism. However, there is an additional risk with a toric IOL as its orientation within the eye is critical to its effect. If it rotates out of position it causes reduced vision and greater astigmatism. Should this occur further surgery to reposition or replace the IOL may be required. Despite this, most toric IOLs remain stable and repositioning rates are less than 10%.

5 - Aspheric IOLs

Traditional IOLs are spherical in contour. Aspheric IOLs are slightly flatter in the periphery and theoretically provide better contrast sensitivity (ability to detect differences between light and dark). However, there is debate as to how large and long lasting this contrast sensitivity benefit is in older patients.

5 - Blue Light-Filtering IOLs

Ultra-violet rays (from the sun) have long been suspected to cause cataracts and other vision problems, and most IOLs filter them out just as your natural crystalline lens does.

There is also some (theoretical) evidence to suggest that blue light (high energy light) may cause retinal damage and possibly age-related macular degeneration. However, blue light is also thought to be important for synchronising the body clock and sleep / wake cycle.

Blue Filtering IOLs = Yellow IOLs incorporate a blue light filter similar to that of the natural crystalline lens. This theoretically at least, retains the protection against blue light that is lost when the natural lens is removed. The yellow tint does not alter the colour of your environment or the quality of your vision and people even cope with one blue light filtering and one clear IOL. However, controversy still exists as to the potential benefit / drawbacks of these tinted IOLs.

We hope this information is sufficient to help you decide whether you wish to go ahead with surgery.

Please write down any questions you may wish to ask the doctor at the time of your consultation or surgery.