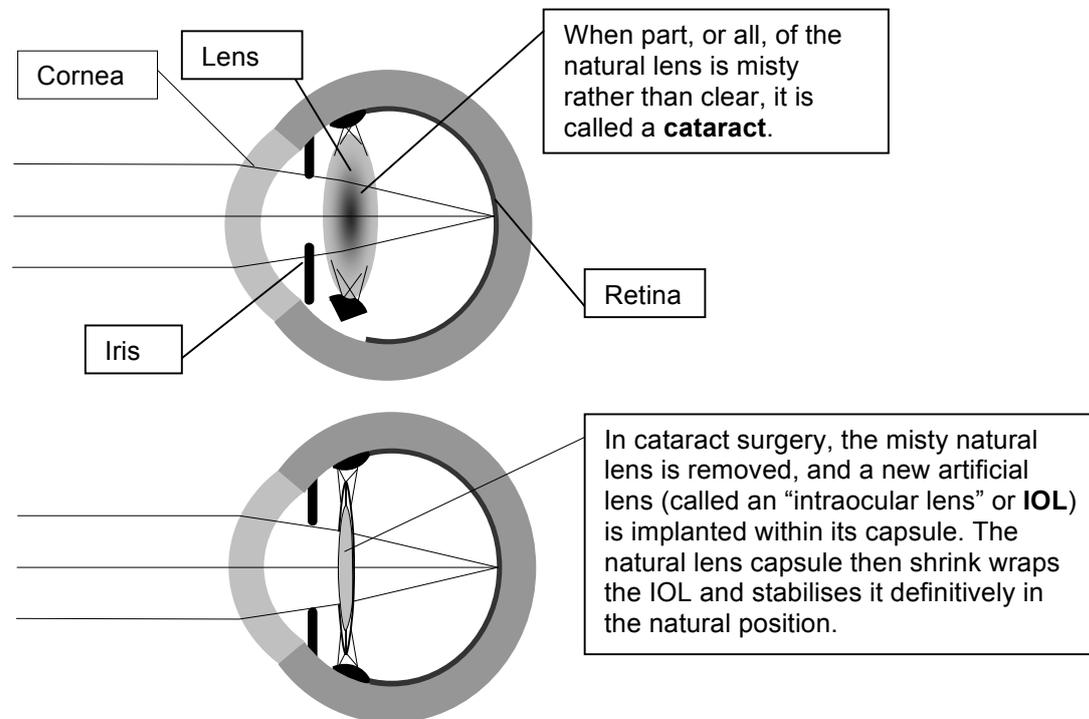


Cataract Surgery & Clear Lens Exchange 2014

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Cataract surgery is the commonest elective operation in medicine. Around 300,000 cataract operations are performed annually in the UK alone. The operation involves replacing the misty natural lens (cataract) with an artificial lens called an intraocular lens (IOL).



Sophisticated measuring techniques are available to guide the choice of IOL focussing power which will minimise your spectacle dependence after surgery. Cataract surgery effectively builds your spectacle lenses into your eyes. Any level of long or short sight can be corrected, and cataract surgery is commonly used as an alternative to laser correction or other implant techniques in refractive surgery. When the operation is used primarily to reduce spectacle dependence rather than to clear blurred vision resulting from a misty natural lens, or cataract, the operation is referred to as refractive lens exchange (RLE).

Cataract surgery is a day case procedure which is normally performed under local anaesthetic. The surgery is virtually painless, and there is little postoperative discomfort. Patients can expect to see quite well within 2 days of surgery. The aftercare is simple (just drops 4x per day) and there are few restrictions on activity.

Modern cataract surgery is a form of keyhole surgery in which the natural lens is removed through a 3.5mm valve incision (3.5mm is about a quarter the width of your little finger nail). High frequency ultrasound energy delivered through a probe is used to liquify the natural lens in a process called phacoemulsification. Lens material is washed out, then a flexible IOL is folded for delivery through the same small incision. Once inside the eye, the IOL unfolds within the lens capsule to lie in the natural position, focussing light accurately on the retina. The small valve incision used in modern cataract surgery is self-sealing, and does not affect the strength of the eye wall.

When is cataract surgery performed?

Because surgeons no longer need to wait for the lens to harden in order to be shelled out like a pea, cataract surgery is now commonly performed at a much earlier stage than previously. But waiting for cataract surgery does not harm the health of your eye, and equally good results can be obtained from cataract surgery performed at an early or a late stage. Typical early symptoms of cataract are light scatter, (e.g. dazzle from oncoming car headlights during night driving) and a progressive shift towards short sight (changing spectacle prescription). Later, the vision

becomes blurry and colours are dulled. Surgery is performed when the patient feels that their symptoms from the cataract are severe enough that they want to expose themselves to the risks and benefits of the operation.

Who needs cataract surgery?

Cataract surgery is not required in everyone with a lens opacity. Mild, asymptomatic lens opacities are common in patients of all ages. Although, technically, these lens opacities are cataracts, surgery is not required if vision is unaffected. Broadly speaking, cataract surgery is beneficial for patients whose visual impairment is bothering them or interfering with important aspects of their life such as the ability to work, drive or read.

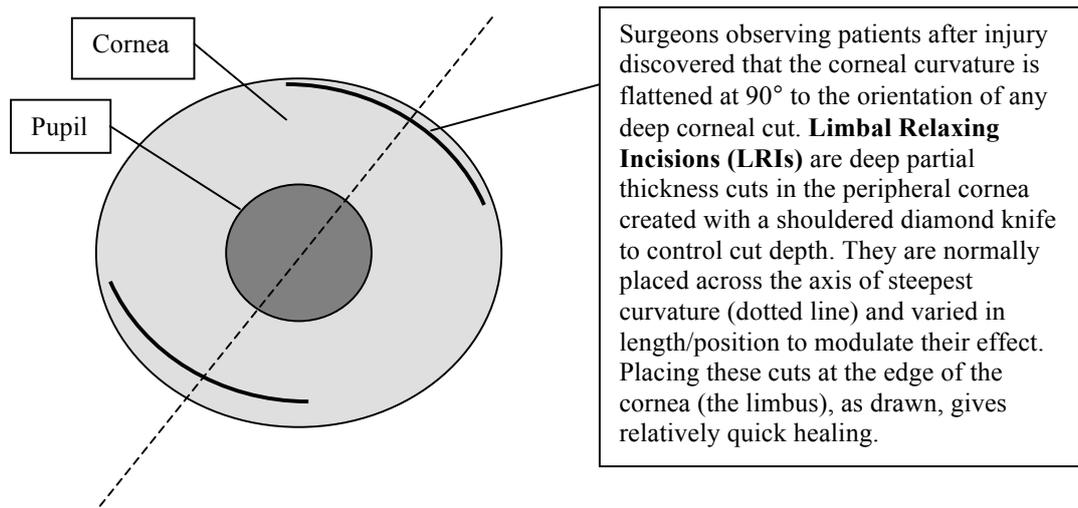
Risks and benefits

- In the absence of other eye problems which may limit vision, around 90% of patients having cataract surgery will be able to see at the level of the driving standard or better without glasses after treatment.
- Reading glasses are normally required after surgery, but dependence on spectacles for near vision can be reduced by targeting better distance vision in one eye and better near vision in the other (monovision).
- IOLs do not deteriorate after implantation and, in the absence of any new problems in the eye, vision should stay good permanently once the recovery from cataract surgery has been completed. The commonest reason for visual deterioration after cataract surgery is posterior capsular opacification (PCO): a frosting over of the tissue surrounding the IOL. This is treated by YAG laser capsulotomy (see below).
- In approximately 1 in 1000 patients, cataract surgery can result in serious and permanent visual loss. Complications that can cause serious visual loss after cataract surgery include untreatable retinal detachment, infection, or spontaneous rupture of sub-retinal blood vessels during surgery (choroidal haemorrhage). All these complications are uncommon; but it is important to be aware that cataract surgery can result in total loss of sight and that you should go to a Casualty Department for an emergency eye examination if you experience either a progressive increase in pain or sudden loss of sight after cataract surgery. Sight threatening complications such as retinal detachment or infection can often be treated successfully if they are caught at an early stage.
- Approximately 1 in 100 patients will require a second operation to correct complications resulting from cataract surgery. In the vast majority of these patients, the final visual outcome is good, but visual recovery may be delayed.
- Approximately 1 in 10 patients will require a laser procedure to restore vision after surgery (YAG capsulotomy) or, less commonly, to reduce spectacle dependence (LASIK or EpiLASIK).
- Cataracts can occur at any age, but the older you are, the more likely you are to develop one. Around 1 in 3 people over 65 will require cataract surgery at some stage. Other eye problems are also more common with age. 1 in 3 patients undergoing cataract surgery will have some other problem with eye health that may influence vision after surgery. A common example would be age related macular degeneration (ARMD), a condition in which function in the central part of the retina (the macula) has deteriorated, causing problems with reading vision and the discrimination of fine detail. Although unrelated problems such as ARMD may limit the visual improvement that can be obtained from cataract surgery, treating the cataract will still normally result in a worthwhile visual gain.

Common additional procedures

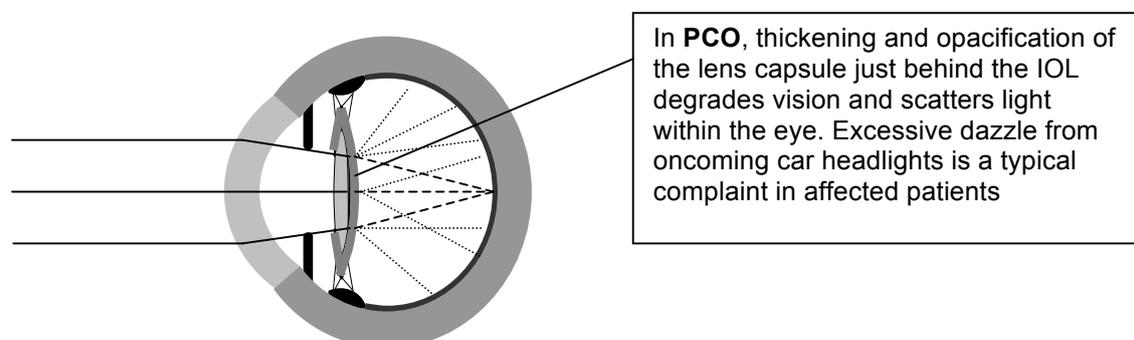
Limbal relaxing incisions (LRI) to treat astigmatism

Cataract surgery does not correct astigmatism, but the procedure can be combined with Limbal Relaxing Incisions (LRI), a simple, safe surgical method for reducing astigmatism in which 1 or 2 partial thickness cuts are made in the wall of the eye at 90° to the steeper radius of corneal curvature. These cuts are placed at the edge of the cornea next to the white of the eye (the limbus) and heal quickly, but the shape of the cornea and the amount of astigmatism is changed permanently. LRIs are normally performed in addition to cataract surgery where more than 1.5D of astigmatism is present prior to the procedure. Smaller amounts of astigmatism can be corrected simply by adjusting the position of the wound through which the IOL is implanted.

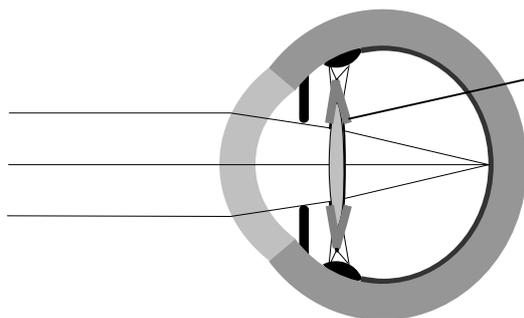


YAG capsulotomy to treat Posterior Capsular Opacification (PCO)

In cataract surgery, the IOL is implanted within the natural lens capsule: a thin diaphanous membrane which encases the natural lens and is often likened to the skin of a grape. In the months after surgery, the lens capsule shrink wraps the IOL and stabilises it definitively in the natural position. Sometimes the lens capsule becomes opacified during this shrink wrapping process, visual quality deteriorates, and it can feel as if the cataract is coming back. The timing of this complication, called posterior capsular opacification (PCO) is variable. But affected patients will typically notice a visual deterioration and problems with light scatter 6 months to 3 years after surgery.



PCO is corrected by cutting through the thin, frosted over lens capsule to restore a clear pathway for light to focus on the retina. This is done with a YAG laser in a painless 15 minute corrective procedure called YAG laser capsulotomy. YAG laser capsulotomy normally restores vision to the level it was originally at after cataract surgery within 24 hours.



YAG Capsulotomy is an effective treatment for PCO. The YAG laser is used to remove the opacified tissue from behind the IOL restoring a clear pathway for light transmission and good quality vision.

Risks associated with YAG laser capsulotomy are well contained. Briefly, these are: IOL damage (approximately 1 in 100 patients) – correctable with an operation similar to cataract surgery in which the damaged IOL is exchanged for a new one; cystoid macular oedema (approximately 1 in 100 patients) – a mild waterlogging or bruising response in the retina which causes a temporary reduction of vision lasting, typically, 6 to 9 months; and retinal detachment (approximately 1 in 350 patients). Some floaters (appearing like moving flies/cobwebs in the field of vision) in association with capsular debris displaced into the (vitreous) gel behind the lens are normal after YAG capsulotomy. But a sudden new shower of floating opacities, lightning flashes, or a curtain like loss of the visual field are danger signs that a retinal detachment may be in progress. If you experience sudden visual loss after either cataract surgery or YAG capsulotomy, you should always go straight to a Casualty Department for an emergency eye examination with your pupils dilated. 9 out of 10 retinal detachments are repaired successfully at the first attempt, but the chances of success are enhanced by intervention at an early stage.

IOL choice

A range of different IOLs is available to suit different requirements in modern cataract surgery. Most of these lenses can now be folded or injected for use in modern, sutureless, keyhole techniques. Current IOLs fall into 3 main categories:

Conventional IOLs

Conventional lenses have a uniform focus and provide excellent image quality, but have a limited range of focus. It is very useful functionally to be able to see clearly at a range of distances after surgery, and surgeons using conventional lenses commonly aim for a spread of focus between the two eyes, so that the two eyes, working together, have a greater depth of focus. This strategy is called monovision. Typically, for patients with good vision in both eyes, the aim will be to focus one eye in the distance and the other at arms length. This helps to minimise spectacle dependence for most activities. But reading glasses are normally still useful for prolonged reading or very fine print, and a distance prescription may be preferred for some activities – especially in low ambient lighting conditions (e.g. theatre, cinema, night driving).

Multifocal IOLs

A variety of different types of multifocal lens has been implanted in cataract surgery over the last 20 years. These lenses produce a greater depth of focus than conventional lenses, but compromise on image quality (you do not get something for nothing optically). For many patients, multifocal lens implants are well tolerated, and reduce the need for spectacles after the operation. This is especially true of the newer diffractive IOLs. Even these new IOLs normally only give good near and distance vision. Viewing intermediate distance objects, such as when working on a PC may be difficult and require glasses. Patients receiving multifocal IOLs do report seeing haloes (rings round lights) or dazzle from lights more frequently than those receiving standard IOLs. For most patients this is not severe enough to offset the advantages of the IOL nor to require removal of the IOL. Patients who drive a lot at night or who spend a lot of time in low light conditions are not good candidates for such IOLs.

Accommodating IOLs

The ideal lens would change shape to provide the flexibility of focussing power required to see clearly in the distance and up close without glasses. This is how the natural lens works until, with age, the lens stiffens, and near vision is lost. Accommodation, or flexibility of focus in the young eye, is a reflex mediated by a circular muscle (the ciliary muscle) just behind the iris from which

the natural lens is suspended via a trampoline like array of tiny ligaments. These ligaments run between the ciliary muscle and the natural lens capsule. Recent research suggests that the apparatus of accommodation does not deteriorate significantly with age. So if we could implant a lens with the same dimensions and flexibility characteristics as the young natural lens, we should be able to restore a life without spectacles after cataract surgery. This is the fundamental aim of modern cataract surgery research. Clear materials with the right mechanical properties have already been developed. But control over the wound healing process which causes the lens capsule to shrink wrap a new lens implant after cataract surgery and to opacify in some patients (see PCO and YAG capsulotomy above) remains incomplete. Until we can preserve the elasticity and flexibility of the natural lens capsule after IOL implantation, accommodating lenses are unlikely to perform well. This is why the current generation of accommodating IOLs based on hinged supporting elements have not delivered any real advantages over conventional lenses in clinical trials.

Planning Treatment

Cataract surgery is a day case procedure: you do not need to stay in hospital overnight after surgery. We do not normally operate on both eyes at the same session.

Time off work

Although the visual recovery after cataract surgery is rapid: you can expect to see quite well within 2 days of surgery, we advise a week off work after each procedure. This is not obligatory, and provided you are able to put drops in 4x per day, a return to work on the Monday after surgery will not damage the eye. Dusty environments are unlikely to damage the eye, but may be irritating, and should be avoided for 1 week after surgery. Patients who are having refractive lens exchange, or cataract patients who were dependent on distance glasses prior to surgery, will have difficulty obtaining balanced vision in spectacles in the week between having the first and second eye operated on. The alternatives for this stage are wearing a contact lens in the unoperated eye, or leaving one eye relatively blurred (simply removing one spectacle lens creates problems with unequal image size). Once the second eye is operated on, there is normally a swift return of balanced vision, and patients on a tight schedule can usually return to work on the Monday following surgery provided that they are able to continue administering drops 4x per day.

Minimum time in the UK for patients coming from abroad

For patients with cataracts coming from overseas, we recommend a minimum of 2 weeks in the UK. An initial consultation should be scheduled on the Monday prior to surgery on the first eye. It is normally safe to fly out after a review consultation on the Monday after surgery on the second eye.

Other limitations on activity

You can be as active as you like after modern cataract surgery. Bending over and lifting heavy weights are no problem, and flying is permissible from the day after surgery. The main limitations are: no swimming for 1 week after surgery and no eye make up for one week after surgery. Driving is fine once you can read a number plate at 70 feet. If you are in doubt, Mr Ionides will check that your vision is at the driving standard on a Monday morning or Wednesday afternoon following surgery in the second eye. Driving with good vision in only one eye (between operations) is legal, but you should obviously exercise caution until you feel confident, and drive short distances by day in familiar surroundings before branching out.