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Cataract surgery

An operation to replace the cloudy lens in your eye with an artificial clear one

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This information is based on *Clinical Evidence*, the *British Medical Journal's* worldwide survey of the best, most up-to-date medical research, used by doctors everywhere.

You can find out more about your condition and your treatment choices at NHS Direct Online (www.nhsdirect.nhs.uk).

This information tells you about an operation to remove a cloudy lens (a cataract) in your eye. It explains how the operation is done, how it can help, what the risks are and what to expect afterwards.

The benefits and risks described here are based on research studies and may be different in your hospital. You may want to talk about this with the doctors and nurses treating you.

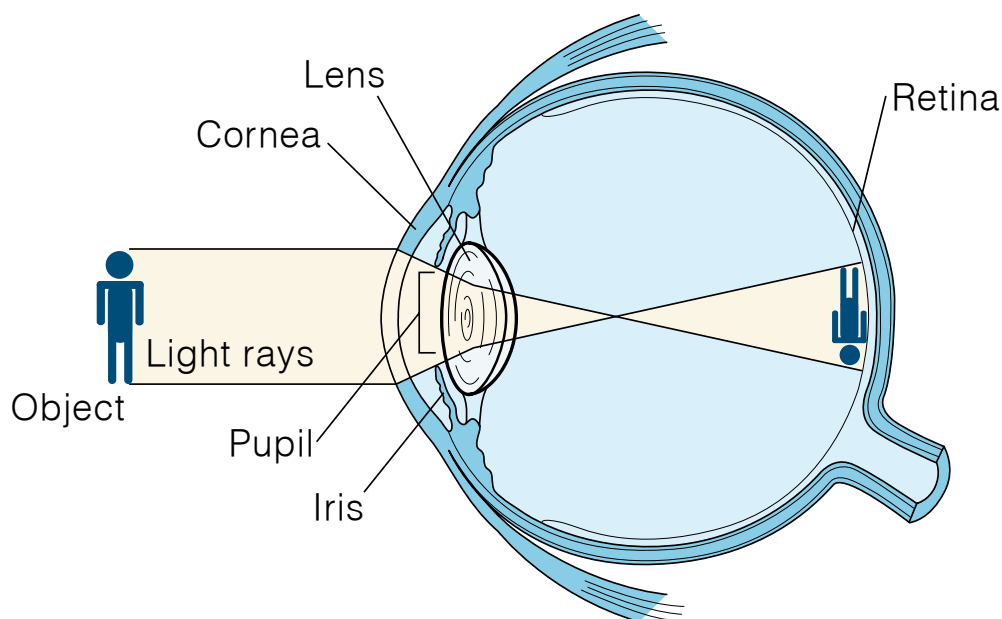
What is cataract surgery?

If you have a cataract, it means the natural, clear lens in your eye has become cloudy. In a cataract operation your surgeon will remove the cloudy lens and put a clear, artificial lens in its place.¹

Your **lens** sits behind the coloured part of your eye (the **iris**) and helps you to see things in focus.

In a normal eye, the natural lens is clear.

When you look at something, light comes into your eye through the hole in the centre (the **pupil**) and passes through the lens to the back of the eyeball (the **retina**). The lens focuses light onto nerve cells in the retina. These nerve cells send signals to your brain. Your brain tells you what the image is. If the lens is cloudy, the image on the back of the eye will be blurred. It's a bit like looking through a dirty windscreen or frosted glass.



Different parts of the lens can become cloudy. Cataracts often begin as clouding around the edges of the lens. You may notice that you get a lot of glare or a 'halo' effect around bright lights, or when the sun is low in the sky. If you drive, you might find oncoming headlights more difficult to cope with than before.² Cataracts can also affect the middle of the lens, which makes your vision foggy.

As the cataract grows:

- Your sight becomes blurry
- You keep having to change the prescription of your glasses
- You may have double vision
- You may find it hard to tell the difference between some colours, especially shades of blue
- You may see 'halo' effects around lights, especially at night.

Cataracts are common. Most are caused by ageing. About a third of people aged over 65 have cataracts in one or both eyes.¹ Getting older and exposure to bright sunlight are the main reasons people get cataracts. Having diabetes, smoking and drinking too much alcohol may also increase your risk of cataracts. Over 200,000 cataract operations are done in the UK each year.

Why do I need a cataract operation?

A cataract operation can:

- Help you see better
- Stop your poor sight interfering with your life.

Not everyone with a cataract needs an operation. Doctors usually suggest the operation when your cataract interferes with your daily life rather than when your eyesight reaches a particular score on a sight test. Your cataract may mean you can't see well enough to read, work, play a sport, go shopping or drive a car.³



Some people manage with their cataract for longer than others because their poorer sight doesn't affect them much.⁴ For example, a person who loves bird-watching may decide they need treatment before a person whose main hobby is listening to music.

In the past, people were advised that their cataract had to be 'ripe' (very bad) before it was worth having an operation. This is because cataract surgery was a big operation that took a long time to recover from, and the artificial lenses used then weren't very good. Now, with safer, quicker operations, cataracts are generally removed earlier, before they cause serious problems. And modern lenses are better.

Sometimes a cataract should be removed even if it's not causing problems with your sight. This is because there's another eye problem that needs treating and the cataract is in the way. Examples of other eye problems are **diabetic retinopathy** and **macular degeneration**.⁵ They are problems with the blood vessels in the eye.

If you have cataracts in both eyes, it's normal to treat them one eye at a time, one or two months or more apart. This is because the treated eye can be sore and needs to settle down for a while.

What happens during the operation?

A cataract operation usually lasts about 10 minutes to 20 minutes. You should be able to go home the same day. You may know someone who has stayed overnight after their cataract operation. People usually only stay in hospital if they have problems after their operation, if they have other eye diseases (glaucoma, for example) or other medical problems that doctors need to check. For most people it's as safe to be at home as it is to stay in hospital, and most people prefer to be in familiar surroundings.⁴ At hospitals that are very experienced in doing cataract surgery, you may be in and out of the hospital within 90 minutes.⁶

Most people have a **local anaesthetic** before the operation. This means you'll be awake during your operation, but you won't feel any pain. If you are very anxious, you may be given a drug (sedative) through an injection into the back of your hand to help you relax. Very occasionally, people have a **general anaesthetic** to make them sleep.

Before your operation, a nurse will put drops into the eye you're having the surgery on. This makes your pupil (the hole in the middle of the coloured iris) bigger so it's easier for your surgeon to reach the lens inside the eye.

You won't usually need to change out of your normal clothes, and you'll probably walk to the operating theatre. Once you're there, you will be asked to lie down on a trolley or bed that has a special pillow to hold your head still. Your face will be covered with special sheets (drapes) to keep germs out of your eye but a space will be left for you to breathe through.

A doctor or nurse will numb your eye with anaesthetic eye drops or gel, or with an injection near the eye.⁷ This may sting a little. The area around your eye and your eyelashes will be cleaned with an antiseptic. This keeps germs from getting inside your eye.

You'll have to lie still and not speak. A nurse will hold your hand and talk to you. He or she will explain how to signal if you feel uncomfortable. During the operation, you'll probably see the light of the microscope your surgeon uses. You may also see flashes of light and changes in colour or brightness, or you may catch a glimpse of the surgical instruments. In a study of 102 people, no one found these things unpleasant, although two people said the light from the microscope was uncomfortably bright.⁸

There are two ways to remove the lens. In both cases, your surgeon will look into your eye with the light of a microscope and make a small cut in the thin film (cornea) that covers the surface of the eye. The surgeon then removes the cloudy lens through the cut. The natural lens sits inside a case of thin tissue called a capsule. The capsule stays in place to support the artificial lens.

The most common way of doing the operation is called **phacoemulsification** (or 'phaco' for short).

- Your surgeon gently makes a cut in the clear, thin film (called the cornea) that covers your eye. The cut is about 3 to 5 millimetres. It isn't painful and heals very quickly.
- The surgeon then puts a tool with a fine needle through the cut to reach the lens inside your eye.
- The tool gives off high-energy ultrasound waves. These sound waves break down the lens into small soft pieces which are then sucked out through the centre of the needle.

- Your surgeon will then put a lens made of a flexible plastic into your eye. This lens unfolds once it's inside the eye. The small cut on your eye shouldn't need stitches.⁷

The other kind of operation is called **manual extracapsular extraction**.

- The surgeon makes a slightly longer cut across your eye and removes the lens in one piece.
- The natural lens is replaced with a rigid plastic lens. Then the cut on the eyeball is closed with stitches. These stitches dissolve and don't need to be taken out.

Your eye may be covered with a pad or you might have a small piece of tape across your eye. You can take this off after a few hours. Some surgeons leave the eye uncovered.

The artificial lenses can come in different focusing strengths, rather like the lenses in glasses. Your eye specialists will have measured your eye before the day of your operation to choose a lens that matches your eye. Doctors call the artificial lens an **intraocular lens (IOL)**. It will become part of your eye, and apart from being clear it won't feel any different from your natural lens.

How can this operation help me?

After your operation, if you don't have other eye diseases, you should be able to:

- See things in focus
- Look into bright light without as much glare
- Tell the difference between colours
- Get back to your usual activities such as reading, working, watching television, sport and driving.

Seeing better

One big study collected information on the results of 18,000 cataract operations that took place in 100 eye units across the country.⁹ It found that most people who have the operation can see much better afterwards, no matter how poor their eyesight was before.

- More than 9 in 10 people who have a cataract operation (and no other eye disease) can see well enough to **meet the legal rule** for driving. Opticians call this **6/12 vision**.
- About 8 in 10 people can see even better than this after their cataract operation. They have what opticians call **6/9 vision**.

People who have cataracts along with another eye problem, such as macular degeneration (a lack of blood to the retina in the eye), diabetic retinopathy (when blood vessels leak blood and fluid into the eye) or glaucoma (pressure builds up in the eye so you can't see well), probably won't see as well after their operation as people who have just cataracts. But about 7 to 8 out of 10 people with other eye problems can still see well enough to drive after a cataract operation.⁹

Eye tests

An eye test called the **Snellen eye test** measures how well you can read a chart made up of six rows of letters. You are asked to read out rows of letters on a chart placed exactly six metres away to find out which are the smallest letters you can see clearly. Researchers use this chart to measure how good people's eyesight is after a cataract operation and to compare it with normal vision.

The first row is usually just one letter and is the size that a person with normal vision could read 60 metres away. Each row beneath this has smaller letters than the one before it. The size of each row of letters corresponds to what a person with normal vision could read at 36 metres (second row), 18 metres (third row), 12 metres (fourth row), nine metres (fifth row), six metres (sixth row), five metres (seventh row) and four metres (eighth row).

If you have normal vision, it's called 6/6. This means that at a distance of six metres you can read the letters on the sixth row. A person with slightly weaker eyesight might only be able to read the letters in the fourth row

at six metres. This is called 6/12 vision, because someone with normal vision could read this row at 12 metres. This is the measure researchers use in studies. It's how well you need to see to legally drive in the UK. If you have 6/9 vision it means you are able to read the letters in the fifth row at six metres. Someone with normal vision can read this row at nine metres. You may have heard normal vision called 20:20. This means the same as 6/6.

Enjoying life more

Researchers have also looked at how cataract surgery affects people's enjoyment of life. One way of doing this is to ask about how a person's eyesight affects their ability to do things like reading the paper, reading labels on bottles, seeing shop signs, cooking, taking part in sport, sewing, filling out forms, playing card games or watching the television.

A set of questions can be asked before and after the operation and the results compared. One study that did this with about 300 people found that most of them had much less difficulty performing everyday tasks four months and 12 months after their operation.¹⁰

But having your cataract removed is unlikely to give you perfect eyesight. Problems such as astigmatism (when the eye is shaped like a rugby ball rather than a sphere) and short-sightedness are not fully corrected by changing the lens. And the eye will not normally be able to change its focus to let you see things in the distance and read things close up without using different glasses.

Is one type of surgery better than another?

Removing the lens in small bits (phacoemulsification) works better than removing it in one piece (manual extracapsular extraction).^{11 12} One year after surgery, more than 9 in 10 people who have phacoemulsification have 6/9 vision. This means you're able to read the letters on the sixth row of an eye chart at six metres away. Less than 9 in 10 people who have their lens removed in one piece see this well.^{12 13}

What are the risks?

All operations have risks, although serious problems with cataract operations are rare.¹⁴ Less than 1 in 10 people have complications during surgery to remove their cloudy lens.¹³ There's a risk that you won't be able to see as well as you did before. But serious problems that can make your sight much worse happen in only 1 in 1,000 operations.⁹

One study found that people who have their lens removed whole (manual extracapsular extraction) are three times as likely to have problems as people who have their lens removed in small pieces (phacoemulsification). About 7 in 100 people had a problem if their lens was removed in pieces compared with 21 in 100 who had their lens removed whole.¹⁴

Problems during the operation

Bleeding: Heavy bleeding inside the eye (haemorrhage) happens to less than 1 in 1,000 people.⁹ But it is serious and can damage your sight. A small amount of bleeding is more common.

Damaged capsule: The capsule that supports the lens can tear or break. This happens to about 4 in 100 people. If it happens, your sight may be worse than before the operation.⁹

Piece of lens left behind: A bit of the lens with the cataract can break off and become lost in the eye. This happens to less than 1 in 100 people. You may need another operation to remove the lost piece of lens.⁹

Problems after the operation

About 1 in 4 people have a problem within a couple of days of their operation. Most of these are mild and clear up without treatment or are easily treated.¹⁹

Swelling of the cornea: The cornea is the clear, dome-shaped layer on the front of the eye. It swells up in about 1 in 10 people. You can lose some sight and be in a lot of pain. The cornea may turn cloudy. Usually, the swelling is temporary and will go away by itself. But you might need another operation to transplant a cornea so you can see better again. This happens to less than 1 in 100 people who have cataract surgery.¹⁵

Increased pressure in the eye: This is uncomfortable and happens to about 8 in 100 people. Your doctor may give you eye drops to make your eye feel better.

Inflammation of the front part of the eye: This is called **uveitis**. It happens to about 6 in 100 people.¹⁴

An infection inside the eye: This is called **endophthalmitis**. It's extremely serious and you can lose your sight in the infected eye. The infection should be treated with antibiotics straight away. About 2 in 1,000 people will get an infection after surgery, and about 1 in 1,000 people lose some or all of the sight in the affected eye.¹⁴

Bruising: It's possible that your eye or eyelid may be bruised.¹

Swelling of the retina: Fluid may build up in the retina between two weeks and 12 weeks after the operation. It usually happens after more complicated surgery and if the lens capsule has torn. If this happens, you'll notice that your sight becomes cloudy a couple of weeks after your operation. Doctors call this cystoid macular oedema. It usually goes down by itself, but you can lose some sight. Less than 3 in 10 people get this after a phaco operation.¹⁴

Injury to the iris: Less than 1 in 100 people have an injury to their iris (the coloured part of the eye) if they have their cataracts removed by phaco. It's more common following manual extracapsular extraction.¹⁴

Problems that may happen later

Some problems can happen months or even years after your operation.

Cloudy lens capsule: This is called **posterior capsular opacification**, or PCO. Around 1 in 5 people get this problem, although it may be less common than this with newer lenses.¹⁴ It happens when the thin capsule that is left in place to support the artificial lens becomes cloudy. As light from the lens has to pass through the capsule, it needs to be clear for you to see sharply. It can be treated with a minor operation using a laser beam.

Detached retina: This is where the light-sensitive area at the back of your eye (known as the retina) comes away from the back of your eyeball or is torn. It happens to around 7 in 1,000 people after a cataract operation.¹⁴ It's extremely serious and could make you blind in that eye. You'll need another operation straight away to put the retina back in place with a laser.

What will happen if I choose not to have an operation?

If you choose not to have an operation, your cataract won't get better and your sight will gradually get worse. Your cataract will keep growing until the whole lens is white and you can no longer see.

Cataracts may cause problems that can severely damage your sight. And leaving them to grow can make surgery more difficult, which increases the chance that something will go wrong during the operation.

But cataracts usually develop slowly over the years, and many people with cataracts manage well with glasses and contact lenses. If your cataract isn't interfering with your daily life, you may choose not to have your operation straight away. Unfortunately, your doctor won't be able to tell you exactly how fast your cataract will grow. There hasn't been any good research on this.

Older people sometimes put off having an operation and may avoid it altogether.

What other treatments are there?

Having an operation is the only way to remove your cataract and improve your sight. Eye drops and other treatments are available to treat cataracts, but there's no good evidence that they work.

New glasses, brighter lighting, anti-glare sunglasses or magnifying lenses might help with the first signs of a cataract (slight cloudiness at the edges of an image), but these won't stop the cataract growing and blurring your sight.

What can I expect after the operation?

After having a rest, you will be able to go home. You won't be able to drive, and if you've had a sedative you'll need someone to stay with you for 24 hours.¹ The operation doesn't usually hurt, but your eye may feel a bit uncomfortable and itchy for a couple of days. Your eye may also be sensitive when you look at bright light or when you touch it.

You'll need to put eye drops in the treated eye every day for several days or weeks. These make it less likely that you'll get an eye infection and will reduce any swelling. The drops may make your vision blurry.

You may need to go back to the hospital soon after your operation. This is so the doctor can check there are no problems with your eye. Some hospitals make checks over the phone rather than asking you to come back in.

You'll be able to do most things when you get home, but take care not to knock your eye. You should be able to read or watch TV almost straight away. But your vision may be blurry as your healing eye gets used to the new lens.¹

It's best not to swim until a few weeks after the operation and you should avoid sports like tennis, where there's a risk you will get knocked in the eye.



You may notice that colours are much brighter than before. This is because your new lens is clear and natural lenses become yellowy-brown as you get older. If you wore glasses or contact lenses before your operation, you may need new ones afterwards because your sight has improved. After a few days, you'll probably be able to see things in the distance well enough without your glasses, but you may find it hard to see things close up until you have new glasses. You'll probably not notice the full benefit of your cataract operation until you get new glasses.

There are laws about how well you need to see before you can drive. Your surgeon will give you advice at the follow-up appointment about when it's safe to drive.

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