



# A guide to your cataract surgery options



# See the difference Optegra can make

As a specialist eye hospital group, Optegra Eye Health Care is proud to support our NHS in providing cataract surgery services at our ten major eye hospitals and clinics across the country.

We have helped tens of thousands of patients receive their cataract treatment much more quickly, as we support the NHS in tackling the large post-Covid waiting lists for eye surgery.

Optegra is unique in that our NHS cataract service is complemented by an established private cataract surgery and vision correction service.

And so, we have an unmatched ability to bring together both advanced vision correction technologies and our extensive cataract surgery services, keeping us at the forefront of modern 'refractive cataract surgery' treatments.

## What does this mean for you, our patients?

This means we can treat your cataract and also improve your day-to-day vision (for example if you are long or short-sighted) all in one procedure – and so actively minimise the need for ongoing use of spectacles or contact lenses.

As you can only have cataract surgery once, we believe that every patient considering NHS cataract treatment should be aware of all the options – and especially around the advanced intraocular lens (IOL) implant options which can be used instead of a standard lens to improve your vision every day for the rest of your life.

We are committed to **fully informed patient choice** – and so we have created this booklet to give you more detail on advanced cataract surgery by explaining the opportunities when using various IOL options.

From your Optegra team.

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# A brief history of the IOL

While the term intraocular lens (IOL) implants may not be familiar, these lenses have been used for over 70 years.

In fact the IOL is one of the most influential British medical inventions of the last century thanks to a young London-based eye surgeon, Harold Ridley.

Ridley first considered the idea of an IOL in the early 1940's as he drew on his experience of treating RAF pilots' eye injuries during WWII.

He had noticed how eyes seemed to be remarkably tolerant to having fragments of Perspex in them - arising from aircraft canopies that sometimes shattered in combat. Perspex behaved very differently to many other types of foreign bodies such as metals, which typically cause a marked reaction and always required removal.

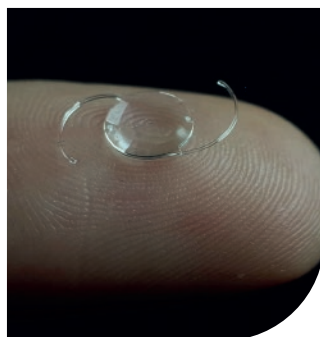
The eye's natural tolerance of Perspex led Ridley to fashion the world's first ever IOL from this material. The rest as they say, is history.

Ridley's courage in developing the IOL should have led to an immediate and widespread acceptance of the concept but in fact it took another quarter century before the IOL really started taking off with a new generation of eye surgeons promoting new designs, materials and developing increasingly advanced optical benefits that lead directly to the current generation of advanced technology IOLs.

## What is a monofocal IOL?

Original IOLs were quite simple in their design. They had a single focusing power concentrated at the centre of the IOL to help provide focus to the eye after cataract surgery. The term for such an IOL is 'monofocal' and today's monofocal IOLs, as used in standard

### A typical IOL



cataract surgery to replace the clouded cataract lens, are descendants of the very first IOL implanted over 70 years ago.

An IOL is required after cataract removal because the natural human lens provides one third of the focusing power of the eye. During cataract surgery, the removal of the cloudy natural lens (the cataract) alone would mean the eye would be left severely out of focus. The patient would then need high power, heavy, thick glasses for best vision.

And so surgeons replace the cloudy lens with an IOL with the power to help get the eyesight in much better focus than if an IOL is not implanted.

### With cataract treatment



### Without cataract treatment



## What is an advanced technology IOL?

As with all technology, IOLs have gone through a series of advancements and as an umbrella term any implant that has properties beyond the simple monofocal lens are referred to as an advanced technology IOL.

These are IOLs which provide additional optical power to monofocal vision.

We will now explain the different types of advanced technology IOLs currently available and the benefits they can provide for patients considering cataract surgery options.

# Cataract surgery with astigmatism

## What is astigmatism?

Many people understand the two most common eyesight disorders or 'refractive errors' – long-sight (hyperopia) and short-sight (myopia); but whilst astigmatism is common, it is less well understood.

Astigmatism is when the eye is not completely round, and this affects the focusing power of the lens. Many describe it as a rugby ball shape rather than a football. Around a third of patients considering cataract surgery have significant astigmatism.

During eye tests, optometrists measure the severity of your refractive error to determine the strength of spectacles you need to see precisely.

Your eye is composed of two naturally occurring lenses: the cornea and the crystalline lens. Astigmatism occurs when one or both of these lenses is not completely round.

This means that when light enters the eye it is bent (or refracted) unevenly within the eyes, so only part of an object is in focus. This results in blurred, distorted vision and objects can appear slanted and ghosted. Uncorrected astigmatism can also cause eye strain and headaches.

## A toric lens



## A non-toric lens



## How toric lenses can help correct astigmatism

The eye scans you undergo at your assessment provide us with an accurate measure of the degree of astigmatism present in your cornea, so the lens is tailored to meet that prescription.

To correct astigmatism, the lens used in cataract surgery is chosen considering the focusing power required across two different curves of your eye.

These powers – or prescription needed in the lens - are based on the natural shape of the eye. In geometry this shape is called a 'torus' and an optical lens which corrects astigmatism is called a toric lens.

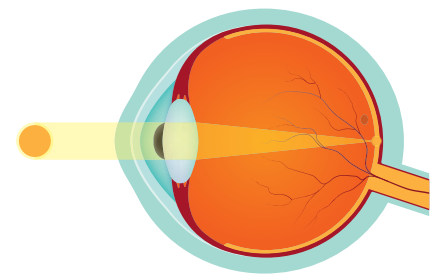
Toric lenses are commonly prescribed in spectacles and contact lenses and over the past two decades have been increasingly used in cataract treatment.

In a standard cataract operation this element of the spectacle prescription is left largely uncorrected, which can result in difficulty with visual performance after surgery and the need for spectacles post op for distance vision and reading.

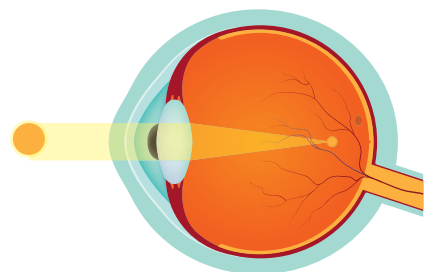
However, toric IOLs can optimise your vision after surgery – by meeting the prescription your individual eyes require. They are available in monofocal, multifocal and extended focus formats.

The results overleaf show the difference in vision outcomes achieved when treating patients who have astigmatism – comparing those who had cataract surgery with a toric IOL and those with a non-toric IOL.

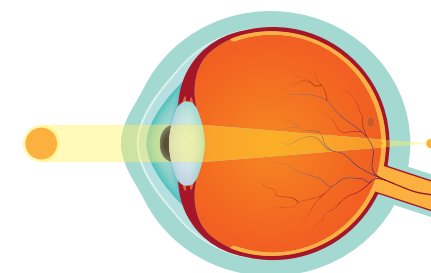
## Normal vision



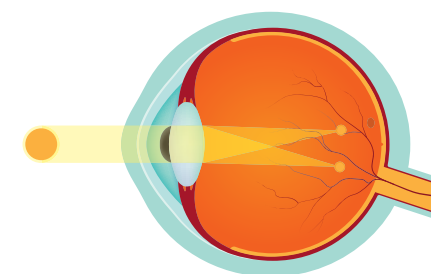
## Myopia



## Hyperopia



## Astigmatism



Normal vision



With astigmatism



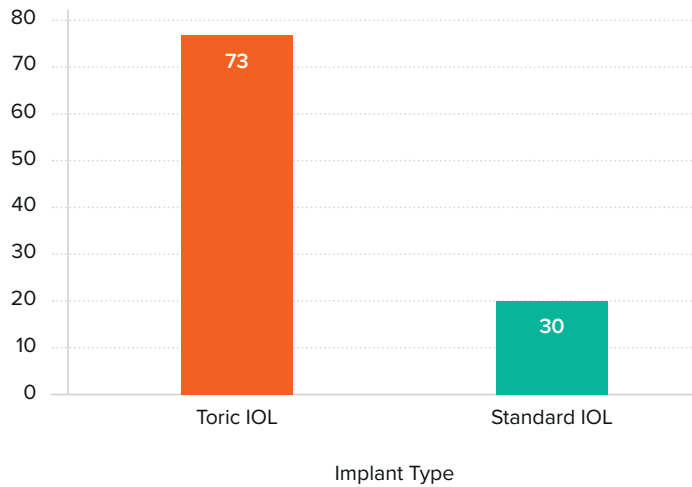
# How toric lenses can help correct astigmatism

These graphs show the benefits of toric IOLs for Optegra patients with astigmatism:

## 73%

On average there was a 73% reduction in corneal astigmatism for patients with toric lenses, compared to only a 30% reduction in those using a standard lens

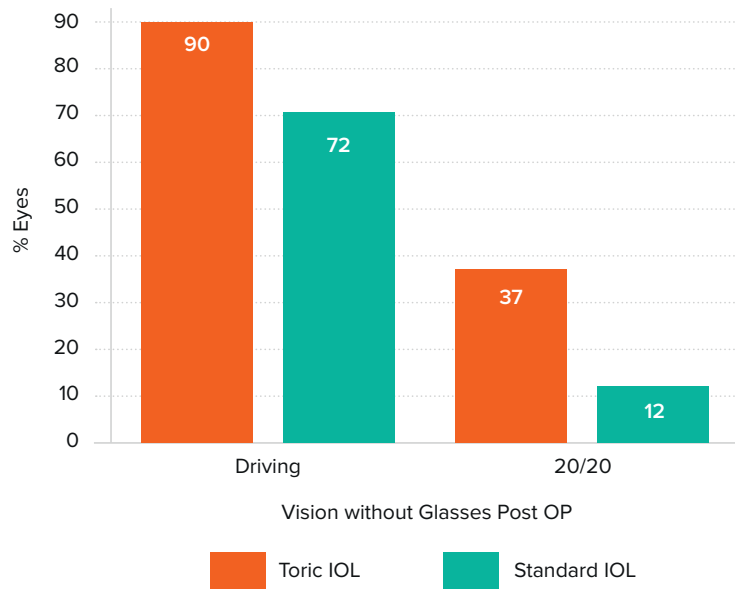
% Correction of Astigmatism Post Surgery



## 90%

of astigmatic patients achieved driving standard vision without glasses after surgery with toric lenses

% Astigmatic Eyes Achieving Driving Standard & 20/20 Vision without Glasses



## 3x

more patients achieved 20/20 'normal' vision, amongst those who had toric lenses, compared to those with standard lenses

The images (right) demonstrate how patients with astigmatism could benefit from a toric IOL. The upper image demonstrates the expected vision (without glasses) when a toric IOL is used, compared to the expected results with a standard lens when astigmatism is known to be present (lower image).



Vision with TORIC INTRAOCULAR LENS



Vision with STANDARD INTRAOCULAR LENS

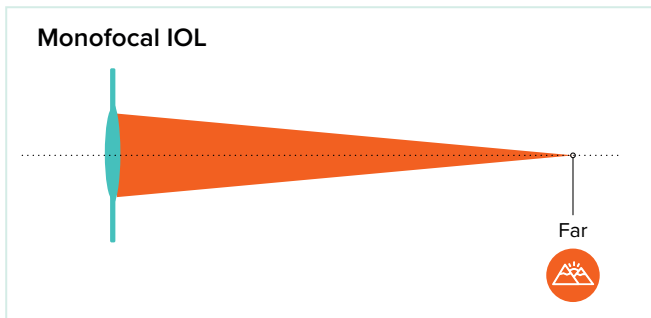
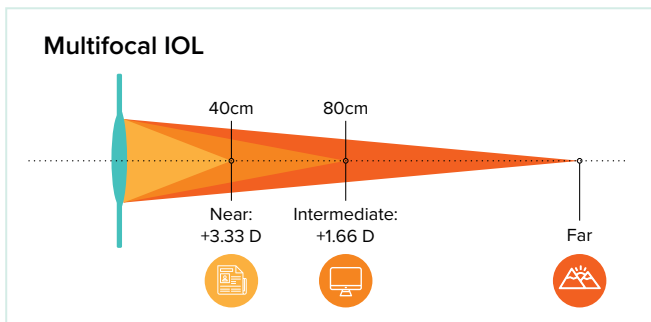


# Multifocal IOL designs

Multifocal IOLs are a result of highly innovative technology, both in corrective power and quality of vision provided.

The different types now available can enable good vision at distance (e.g. for driving), near (around 40cm e.g. for reading) and mid-range (around 70-80cm e.g. for computer work).

Multifocal IOLs are designed to have two or three focal points which means vision can be restored at more than one distance and options include bifocal and trifocal designs.



Vision following multifocal treatment



Optegra's preferred multifocal IOLs are the trifocal variety as they allow the highest level of independence from glasses and they appeal to a broad range of patients.

There are a few things for your consultant to consider when choosing your lens. For example:

### Are you suitable for this lens?

If you suffer from a progressive eye disease such as diabetic retinopathy, glaucoma or macular degeneration, you may not be a suitable candidate for multifocal lenses. In this case, your consultant will discuss alternative options for you.

### Are you aware of possible side effects?

One side effect associated with multifocal implants is a higher degree of visual disturbance and reactions to light, caused by the lens focusing light from multiple distances. This can lead to glare in certain low lighting situations or halos around light sources at night.

Most people with multifocal lenses find these phenomena only mild and get used to them. However, there is a small group of patients who do not adapt well or are very bothered by the side effects that may occur.

Another consequence of the multifocal implants might be a slightly less perfect image quality. This is due to the lens splitting light from different distances on the retina. Patients may have a small degree of compromise on image sharpness in order to have significantly better closer range vision without requiring glasses.

Your consultant will advise on the light features and benefits during your consultation to check if you are a good candidate for a multifocal IOL.

Vision following monofocal treatment





## Optegra outcomes with multifocal IOLs

### Advanced technology IOLs



**99%**

of patients achieved driving standard or better without glasses



**96%**

of patients could read newspaper print size without glasses

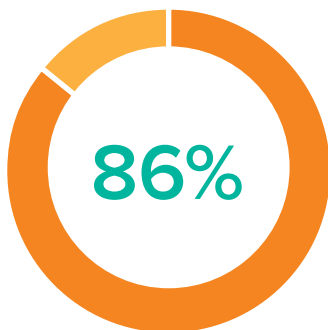
- Postoperative binocular near and distance vision outcomes.
- Only patients that could achieve monocular corrected 6/6 or better with each eye preoperatively were included.
- Binocular near vision results correspond to the best unaided new VA of either eye where binocular near VA data available.
- Includes results from eyes implanted with all types of IOLs (trifocal, EDOF).
- Treatments carried out at Optegra Eye Hospitals during the period from Jan 2017 – Oct 2020.
- Outcome as measured at latest available appointment which may differ from time point when monocular VA data was collected.

### Patient experience – advanced technology IOL

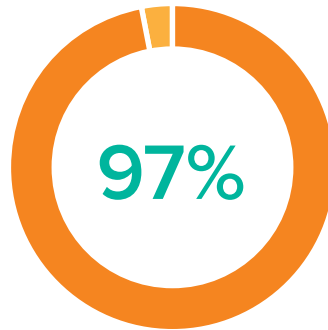


**99%**

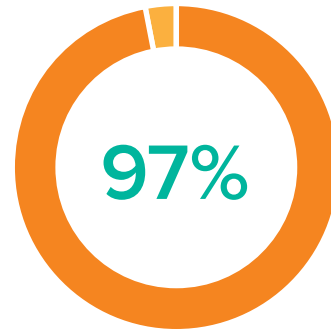
would recommend to family and friends



I am free from the need to wear spectacles.



I am satisfied with the results of my treatment.



I feel my quality of life has improved following my treatment.

- These figures represent the results collected during 2019 from patients who underwent RLE irrespective of the type of IOL implanted.
- Includes data from 277 respondents on PROMs.

# Extended Depth Of Focus (EDOF) IOLs

An EDOF IOL is used to treat presbyopia which is the need for reading glasses due to age, which many people notice in their 40s.

It aims to provide distance vision as well as intermediate vision, which cannot be achieved simultaneously with traditional monofocal IOLs.

The clever concentric ‘diffractive’ design – allowing light to hit various points of the lens – ‘stretches’ a single focal point to improve a patient’s intermediate range vision, while maintaining good distance vision and a smooth transition between the two.

EDOF lenses aim to provide independence from glasses, particularly for distance and intermediate vision (i.e. computer screen work, reading music etc). However, please note it may produce some ‘glare and halo’ side effects. The degree of this side effect is generally somewhat less than those experienced by multifocal IOLs.

It is also important to know that while an EDOF IOL can provide very good intermediate range vision, it does not typically provide the same degree of near vision as would be expected from a multifocal, so reading glasses may be needed.



Treatment with monofocal



Treatment with EDOF lens



# Extended Field Monofocals

These types of lenses are optically closer to a monofocal lens in appearance and design, and are sometimes referred to as an ‘enhanced’ monofocal lens.

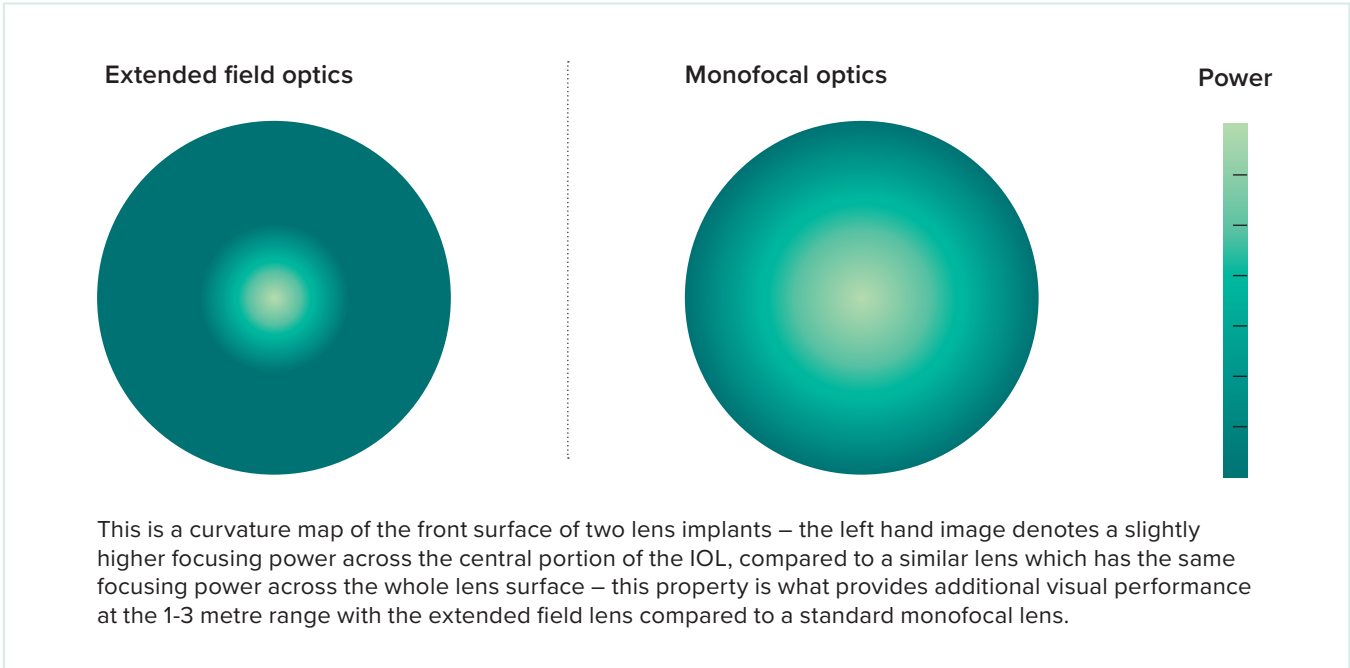
They are designed to address an issue with a standard monofocal lens, where such implants can lead to some reduction of vision at the 1-3 metre distance – so called social interaction range.

Enhanced monofocal lens implants address this to improve the vision performance from far distance all the way through to around the one metre range.

The extended depth of field is achieved by subtle changes in curvature of the front lens surface from the centre to periphery. This stretches the lens focal point without affecting a patient’s distance vision.

As a result, enhanced monofocal IOLs produce minimal visual side effects (i.e. little or no glare or halo) and can work well even in the presence of conditions such as early age related macular degeneration.

It should be noted, however, that these types of lenses do not provide as sharp intermediate or near vision as an EDOF or trifocal lens designs and so glasses are normally still needed to help with tasks such as reading and using computer screens.



Vision with monofocal lens



Vision with extended field monofocal lens



# Cataract surgery having had previous laser eye surgery

## Why does previous laser eye surgery impact your current cataract surgery?

Firstly it's important to understand how the consultant chooses the focusing power of your lens implant.

Many people wrongly believe that your pre-op eyesight prescription is what determines the focusing power of the lens implant. However, this is not the case. It's easier to understand why when you consider how an eyesight prescription is calculated.

### The three main variables are:

- 1 The overall focusing power of the cornea – the clear window at the front of your eye
- 2 The overall focusing power of your natural lens – when cloudy this is called the cataract
- 3 The length of your eye from cornea to retina.

When you undergo cataract surgery the natural lens of the eye is removed, so in effect only variables 1) and 3)

now remain relevant. Thankfully it is possible to measure both the power of the cornea and the distance light must travel to reach the centre of your retina to a very high level of accuracy with modern instruments.

These 'biometric' measures are then fed into sophisticated modelling formulae (typically peer-reviewed and published algorithms) which allow us to calculate the power of the lens implant required to produce a given optical result.

The problem that arises after previous laser eye surgery (or after the old-fashioned Radial Keratotomy (RK) procedures) is that the assumed relationship between the very front surface of the cornea and the back surface changes. This is more marked for people who have previously had laser eye surgery for short-sight than for those who had laser eye surgery for long-sight or RK surgery. This can therefore have a substantial impact on the level of accuracy of lens calculation formulae.

## Post laser vision correction



**88%**

of the eyes achieved driving standard or better without glasses



**54%**

of the eyes achieved 20/20 without glasses

- These figures represent the results collected during 2019 from patients who underwent RLE irrespective of the type of IOL implanted.
- Includes data from 277 respondents on PROMs.



### How we can optimise cataract surgery outcomes after laser eye surgery?

There are several robust and methodical approaches to ensure the required calculations are sourced, despite the cornea being changed by laser eye surgery.

The methods employed are beyond the scope of this booklet, but it is now possible to get much closer to the highly accurate calculation results seen in people who have never had laser eye surgery.

We can measure the power of the front and back surface of the cornea to incredible accuracy with the latest scanning equipment available at all Optegra hospitals. This combined with the expertise of our leading cataract and refractive surgeons assures you of the best chance of the excellent outcome you deserve.

It is important to state, however, that even with the most advanced approach available anywhere in the world, it is possible to be 'off target' due to confounding factors. In such scenarios, at Optegra we are well placed to offer additional refinements – either with further laser eye surgery or with additional lens

implant treatment to help ensure we achieve the result you wished for. These measures are also built into our special package price, so you can rest assured we will do everything we can to secure your required result.

Finally, you can also help us by digging out your eyesight prescription as it was before your laser eye surgery or RK surgery; and ideally also what the early results of the procedure were. It is not essential, so don't worry if you cannot find this information – but it is helpful. You can often source this information from your optometrist or from the company or surgeon that performed your previous surgery.

# How to arrange your private cataract surgery with Optegra

We fully understand that many patients will be a little confused about the difference between NHS-funded cataract treatment and private cataract treatment.

Here we outline some of the major differences so that you are well informed of all the facts if you are considering the possibility of private or health insurance-funded cataract treatment.

Please note some private health insurance providers allow 'top-up' funding for patients requesting any one of the advanced lens implants described above. Should you ultimately opt to continue onto our NHS cataract treatment service you can be assured that we apply the highest clinical standards for every one of our patients whether NHS or privately funded.

As we hope this booklet has demonstrated, there are some clear differences and increased options in the treatment available for patients outside of the standard NHS cataract service package.

Those opting for private or insurance-funded\* cataract treatment can expect the following additional service elements:

1	Your care is assigned to one of our leading vision correction consultants. You will have direct telephone and email access to your consultant's patient experience advisor.
2	You and your consultant can together select the lens implant(s) best suited for your vision requirements, meaning an excellent prospect of achieving the goals you set out in your consultation.
3	Many of our private patients safely opt to have both eyes treated in the same theatre session, significantly reducing hospital visits and downtime.
4	Your follow-up care is also overseen by your consultant.
5	Many of our service packages also include additional vision refinement treatments (e.g. laser vision correction) as complimentary to maximise the prospect of achieving the vision goals set prior to surgery**.
6	Many of our service packages include follow-up aftercare for a period of up to 12 months, including provision for YAG laser capsulotomy should it be clinically necessary in that period**.

\* Please note that many private medical insurance providers will allow 'top up' funding for members who opt to request for a lens implant beyond the standard monofocal lens. The cost of this service upgrade is detailed on [www.optegra.com](http://www.optegra.com). This is in contrast to NHS funding organisations who will not allow this type of co-payment arrangement.

\*\* Excluding our standard private cataract package



## Price list and finance options

Please refer to the detailed price lists on [www.optegra.com/cataract-surgery-costs/](http://www.optegra.com/cataract-surgery-costs/)

We have a number of different payment plans to assist you with the cost of cataract surgery, including finance plans spread over 12, 24, 36 or 48 months.

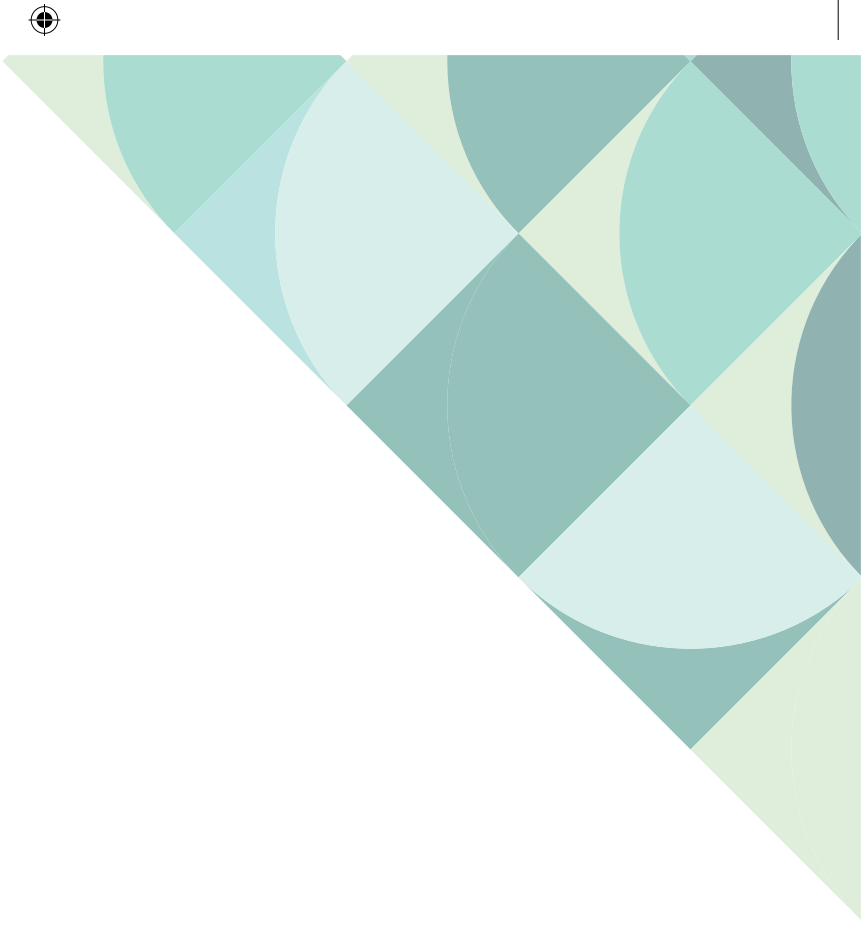
If you decide to go for a 12 or 24-month payment structure, you can benefit from 0% APR. A 10% deposit is required, irrespective of the finance plan you choose.

A consultation with our highly specialized Optometrist is free. Your cataract procedure will be carried out by one of our world-class ophthalmic surgeons.

## What next?

If you are interested in exploring your cataract surgery options, to ensure you make an informed choice, please contact us on **0800 031 4284** or email: [eyecare@optegra.com](mailto:eyecare@optegra.com) to set up your no-obligation, free one-to-one consultation.

[www.optegra.com](http://www.optegra.com)



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[www.optegra.com/cataract](http://www.optegra.com/cataract)