PATIENT INFORMATION

Choosing Your Lens Implant

Monofocal, toric, extended depth of focus (EDOF) and trifocal lenses: benefits, compromises and realistic expectations.

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Understanding your choices

During cataract surgery, the cloudy natural lens is replaced with a clear artificial lens called an intraocular lens (IOL). Its optical design and power are chosen to suit your eye and visual priorities. No lens guarantees perfect vision, freedom from glasses or complete satisfaction.

TWO DECISIONS, NOT FOUR MUTUALLY EXCLUSIVE LENSES

Monofocal, EDOF and trifocal describe the range of focus. **Toric** describes correction of corneal astigmatism. A toric version may be available with a monofocal, EDOF or trifocal design.

At a glance

DESIGN	MAIN AIM	EXPECTED GLASSES USE	MAIN COMPROMISE
Monofocal	One principal focus, usually distance	Reading and usually computer glasses; distance glasses may help	Less range without glasses
EDOF	Extend focus mainly from distance to intermediate	Plan for reading glasses, especially small print	Near vision limited; contrast or light effects vary by lens
Trifocal	Distance, intermediate and near focal ranges	Less reliance overall; glasses can still be needed	More potential for halos, glare and reduced contrast

What the viewing distances mean

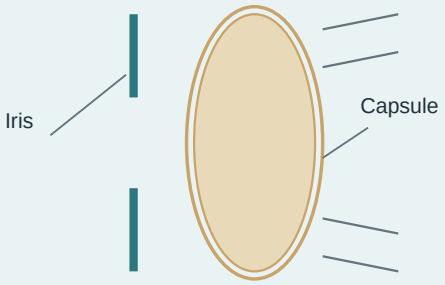
Distance includes looking across a room or driving; intermediate means arm's-length tasks such as a computer or cooking; near includes reading a book or phone. Exact working distances depend on the lens model and your final prescription. These categories overlap and are not guaranteed boundaries.

The comparisons in this guide describe typical patterns, not a prediction for your eyes. Read this alongside the cataract-surgery leaflet and any information for the specific lens being considered.

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A different lens, a different optical system

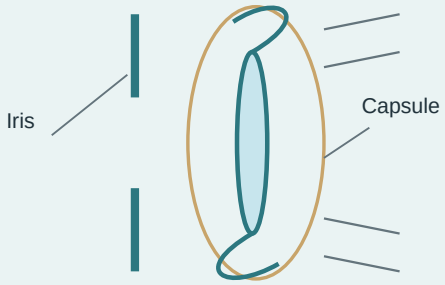
NATURAL CRYSTALLINE LENS



Natural lens fills its capsule

Changes shape to focus when young

ARTIFICIAL LENS (IOL)



Thinner optic with supporting arms

Most implants do not change shape to focus

Simplified side views, not to scale. Implant shapes and supporting arms vary by model.

What changes anatomically?

Your natural crystalline lens is living tissue within a thin capsule, supported behind the iris. In youth it changes shape to focus; this ability reduces with age, and a cataract clouds the lens. Surgery removes the lens contents and places a manufactured optic with supporting arms (haptics) inside the remaining capsule. The implant differs in thickness, shape, material and edge profile; it is not an anatomical replica of the natural lens.

Your brain needs time to adjust

The optical system changes during a single operation. In effect, overnight you are asking your brain to interpret vision through a different lens after years of seeing through the natural one. The image may look brighter, sharper or simply different. The brain needs time to adjust to this new visual input, a process called neuroadaptation. Healing, the final prescription and the balance between the eyes also affect what you see.

ADAPTATION IS INDIVIDUAL

Adjustment may take weeks or months. Many people become less aware of unwanted effects over time, but there is no fixed deadline and improvement cannot be guaranteed. Persistent or troublesome symptoms should be assessed, not simply dismissed as a need to adapt.

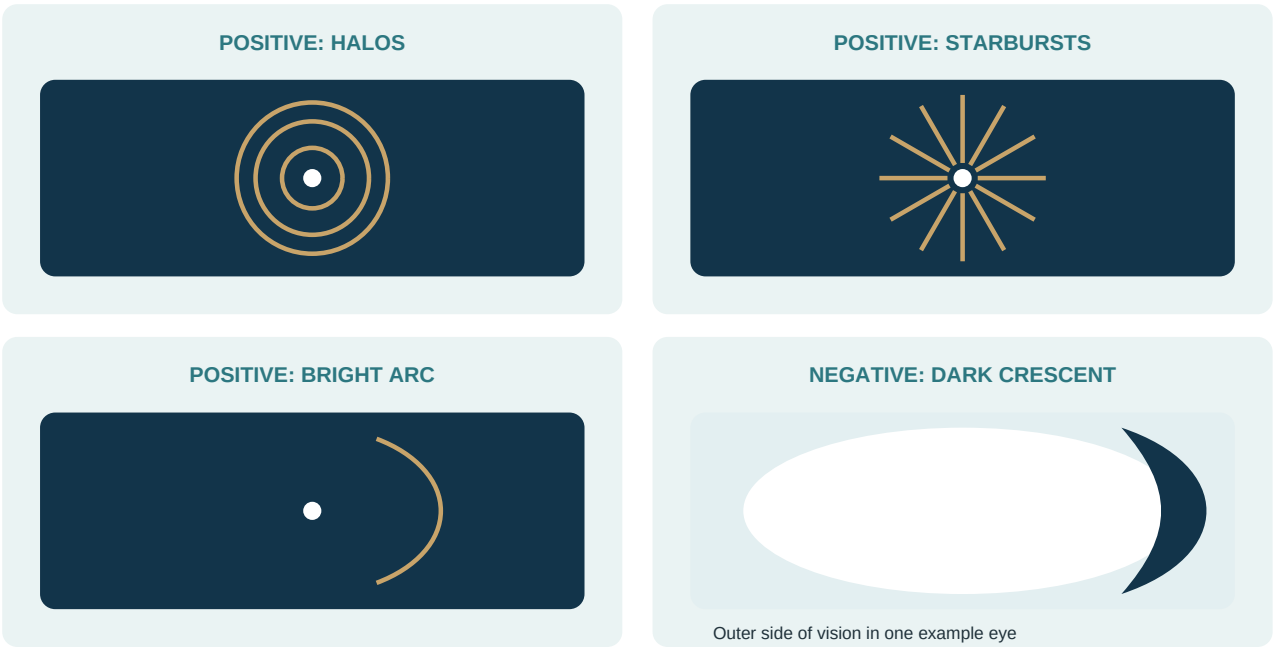
This applies to every lens category

Monofocal, EDOF and trifocal lenses - including toric versions - can all produce unwanted visual effects. Lens edges, material and position, pupil size and the relationship between the implant, capsule and iris can contribute. The mechanisms are complex: anatomy is part of the explanation, not the only cause. A monofocal lens reduces some optical compromises but does not eliminate the possibility of dysphotopsia.

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Positive and negative dysphotopsias

Dysphotopsia means an unwanted visual effect after lens implantation. Positive means added light effects; negative means a dark area or shadow. Both can occur after otherwise successful surgery, including with monofocal lenses.



Illustrations of possible perceptions only; appearance, size and severity vary between people.

Positive: added light

Examples include bright arcs, streaks, starbursts, glare or rings around lights. They can arise from light interacting with the implant's surfaces or edge; halos can also relate to its focusing design. Halos are generally more associated with multifocal or trifocal optics, but no lens category is immune.

Negative: a peripheral shadow

This is often described as a dark crescent or arc on the outer (temporal) side of vision. It may relate to the way light passes through or around the implant and its relationship with the capsule and iris. It can occur with different IOL designs and is diagnosed only after other causes have been excluded.

Assessment and adaptation

Many symptoms lessen over time, although some persist. An examination can look for dry eye, residual prescription, capsule changes, implant position or retinal problems. Management depends on the cause and severity. Persistent severe symptoms occasionally require further treatment; neither adaptation nor treatment guarantees resolution.

DO NOT ASSUME A NEW SHADOW IS DYSPHOTOPSIA

New flashes, a sudden increase in floaters, a curtain or shadow, or reduced vision require urgent eye assessment to exclude retinal detachment or another problem. Do not wait for adaptation or your routine appointment.

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Monofocal lenses

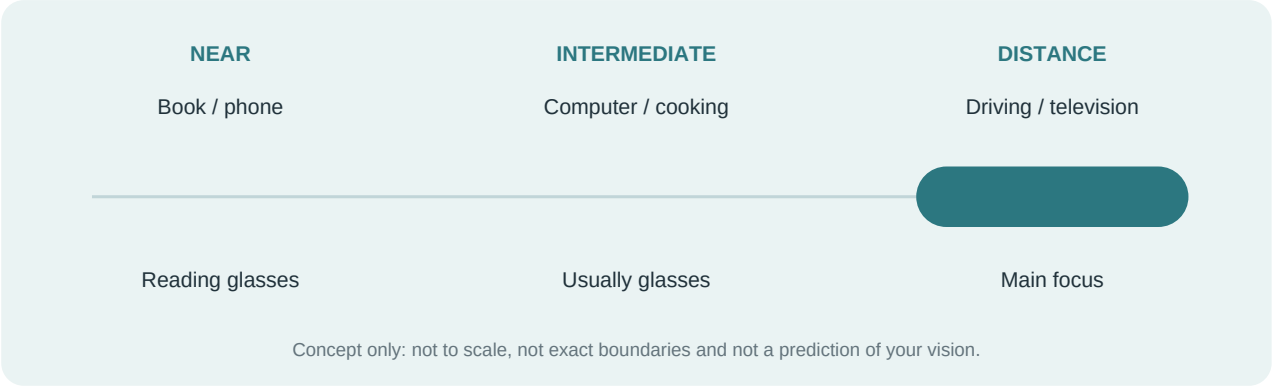


Diagram assumes a distance target. A monofocal lens can instead be targeted nearer, with glasses then needed for distance.

A monofocal lens has one principal focus. It is most often chosen to aim for clear distance vision in both eyes, with glasses for reading and usually computer work.

Why choose a monofocal lens?

It usually offers good optical quality with fewer halos and less glare than a multifocal design. It can be a good choice if you are comfortable wearing glasses, if night-driving quality is a major priority, or if another eye condition makes a broader-focus implant less suitable. Optical symptoms can still occur with a monofocal lens.

Choosing distance or near

A monofocal lens can instead be targeted for near vision. This may suit someone used to taking off glasses to read, but distance glasses will then be needed. The target must be agreed before surgery. Even a well-chosen target is not guaranteed.

Mini-monovision: eligibility in this practice

Mini-monovision targets one eye for distance and the other slightly nearer. It is offered directly only to suitable patients who already routinely use monovision with their glasses or contact lenses. For anyone else, it is considered only after a special contact-lens trial, which incurs an additional charge. It can reduce depth perception or binocular distance sharpness, and reading glasses may still be needed.

A successful trial does not guarantee the surgical result. Monovision with your natural lenses (phakic monovision) differs from mini-monovision with lens implants (pseudophakic mini-monovision). The natural lens and an implant focus differently. The visual experience and satisfaction achieved with glasses or contact lenses cannot always be replicated after surgery.

Enhanced monofocal lenses

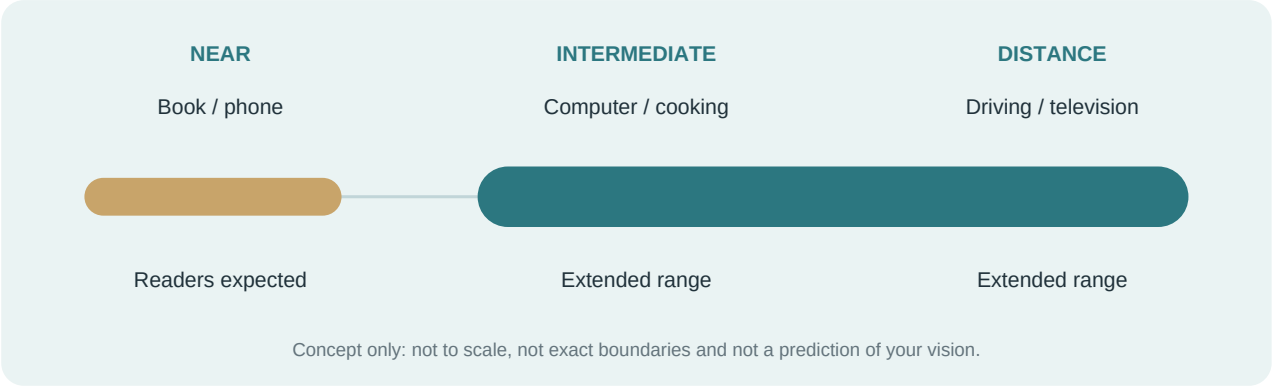
Some monofocal designs modestly extend the range towards intermediate vision. They do not provide the same near range as a trifocal lens, and readers should still be expected. Performance depends on the particular model; ask what extra range is realistic.

EXPECT GLASSES FOR OTHER DISTANCES

If your lens is targeted for distance, expect reading glasses and often computer glasses. Glasses may also improve distance sharpness, particularly for demanding tasks.

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Extended depth of focus (EDOF)



The gold near band represents variable functional near vision, not reliable small-print reading without glasses.

An EDOF lens extends the range of focus, mainly from distance through intermediate vision. It can reduce reliance on glasses for activities such as computer work, cooking and looking at a dashboard. Some useful near vision may be available, particularly for larger print in good light.

READING GLASSES SHOULD BE EXPECTED

Plan to use reading glasses, especially for small print, prolonged reading and detailed close work. Being able to read a phone briefly does not guarantee comfortable book reading without glasses.

A balance between range and optical effects

EDOF lenses generally aim to give more intermediate range than a standard monofocal, with fewer troublesome light effects than a trifocal. However, EDOF lenses use different optical technologies; their contrast, near performance and halo profiles are not interchangeable. Ask about the actual model proposed.

Glare, halos and contrast

Halos are rings around lights; glare is dazzle; starbursts are light streaks. These can occur with EDOF lenses and may affect night driving. Contrast can also be reduced, so an object may be harder to distinguish from its background even when the eye-chart result is good.

Clareon Vivity as one example

Vivity is a non-diffractive EDOF design. Its manufacturer reports low levels of bothersome light effects, but specifically warns of a likely significant reduction in contrast sensitivity compared with a monofocal lens. Particular caution is needed in dim light or poor visibility. Refer to the separate Vivity leaflet if this is your proposed implant.

Mini-monovision with EDOF

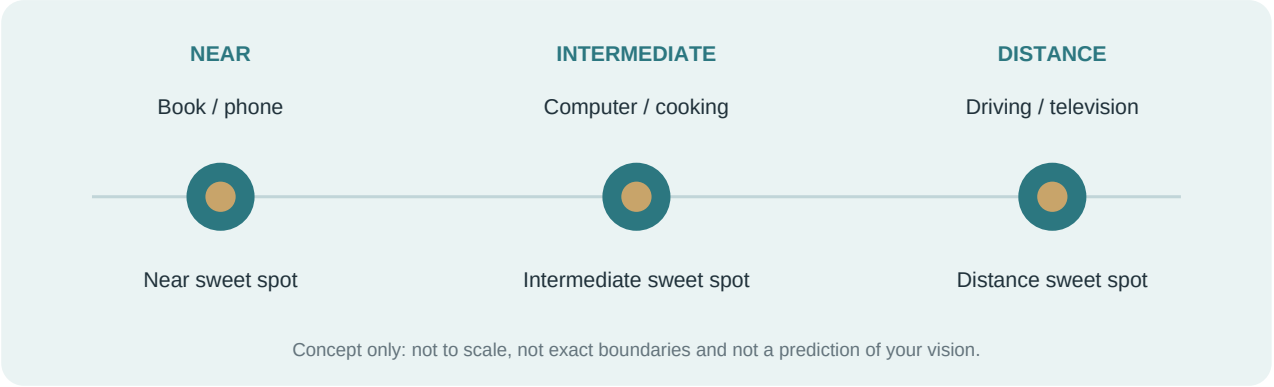
A slightly nearer target in one eye may improve some near tasks but can compromise distance sharpness or depth perception. In this practice it is offered directly only to suitable patients already routinely using monovision with glasses or contact lenses. Anyone else needs a special contact-lens trial first, at an additional cost. Monovision with natural lenses is different from mini-monovision with implants: previous results and satisfaction, including during a trial, cannot always be replicated. Reading glasses should still be expected.

Who may consider it?

Someone prioritising distance and arm's-length vision who accepts readers may prefer this balance. Eye health, occupation and night-driving requirements still determine suitability.

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Trifocal lenses



A trifocal lens distributes light between three main focal ranges: distance, intermediate and near. It aims to reduce glasses use across more everyday activities than a standard monofocal lens.

Three visual sweet spots

Think of three intended areas of optimal focus rather than effortless focus at every possible distance. For example, PanOptix is designed around near at about 40 cm, intermediate at about 60 cm, and distance. Other trifocal models differ. Useful vision may extend between these ranges, but clarity can vary and your own best working distances may differ.

Potential benefit

You may be able to carry out many distance, computer and reading tasks without glasses. Nevertheless, glasses can still be useful for very small print, long reading sessions, poor lighting or residual prescription. Complete spectacle independence is not guaranteed.

The optical trade-off

Dividing light between focal ranges can produce halos, glare and starbursts, especially around headlights at night. Contrast or crispness may be lower in dim light. Good eye-chart vision does not guarantee satisfaction with real-world vision.

Adaptation is individual

The brain may become less aware of optical effects over time, but the speed and success of adaptation vary. Symptoms can persist and occasionally remain unacceptable. Treatable contributors such as dry eye, residual prescription, lens position or capsule clouding should be assessed.

DISCUSS NIGHT DRIVING BEFORE YOU CHOOSE

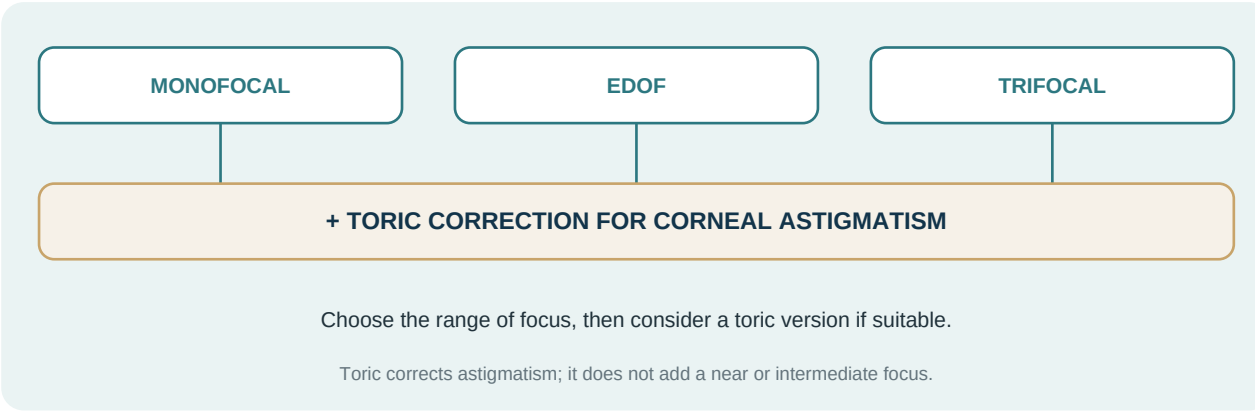
If night driving is essential, or you would struggle to accept rings or streaks around lights, discuss this carefully before selecting a trifocal lens. Low-light visual quality may matter more to you than avoiding reading glasses.

Suitability and alternatives

A healthy cornea, retina and optic nerve are important. Certain eye conditions or previous surgery may reduce suitability or the expected benefit. A monofocal or EDOF option may offer a better balance for some patients. Persistent severe symptoms can occasionally lead to consideration of lens exchange, which is further surgery with additional risks and no guarantee of resolution.

07

Toric: an option for every lens type



Choose the range of focus, then consider a toric version if suitable.

Toric corrects astigmatism; it does not add a near or intermediate focus.

Astigmatism occurs when the eye focuses light differently in different directions. Regular corneal astigmatism is often described as the front of the eye being curved more like a rugby ball than a football. It can blur or distort vision at all distances.

What a toric lens does

A toric IOL contains astigmatism correction. It must be positioned at a calculated angle inside the eye. Reducing corneal astigmatism can improve unaided sharpness, but a toric lens does not automatically provide reading vision.

TORIC CAN BE COMBINED WITH THE RANGE YOU CHOOSE

Monofocal toric: one principal focus plus astigmatism correction.
EDOF toric: extended focus plus astigmatism correction.
Trifocal toric: three focal ranges plus astigmatism correction.

Measurements and suitability

Corneal scans and lens measurements help determine the type and amount of astigmatism. Dry eye, previous corneal surgery or irregular astigmatism may make measurements or correction less predictable. Not all astigmatism is suitable for a toric implant, and some irregularity may remain.

Alignment and rotation

The lens can rotate after surgery. If it moves far enough from the intended angle, correction is reduced and repositioning may be recommended. Additional surgery has its own risks and cannot guarantee a perfect result. Residual astigmatism may also occur despite correct alignment.

Will I need glasses?

This depends on the underlying optical design, final prescription and task. A monofocal toric targeted for distance still normally requires reading glasses. Any toric design may leave a prescription that benefits from glasses or, where appropriate, further treatment.

Other ways to manage astigmatism

Alternatives may include glasses, contact lenses, selected corneal incisions or laser treatment. These have different benefits and limitations and are not all suitable for every eye.

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Making the choice together

The best choice is the one that suits your eyes and priorities. A more expensive lens does not necessarily give the best result for a particular person. Decide which matters most: reduced glasses use, night-driving quality, near detail or a particular working distance.

Your assessment matters

Measurements, corneal shape, astigmatism, tear film, retinal health and previous surgery influence the recommendation. Tell the team about previous laser vision correction, even many years ago. No calculation can guarantee an exact final prescription.

Risks shared by all lens choices

All require intraocular surgery. Recognised risks include infection, bleeding, inflammation, pressure changes, corneal or retinal swelling, retinal detachment, capsule damage, implant movement and permanent loss of sight. This list is not exhaustive. The general cataract-surgery leaflet and your individual consent discussion cover these in more detail.

Further treatment and cost

A residual prescription may be managed with glasses or contact lenses, or in selected cases laser treatment or further lens surgery. Capsule clouding may need a separate laser procedure. Ask about lens charges, what your package or insurance covers, and the possible costs of additional treatment. No further procedure guarantees the result you want.

REALISTIC EXPECTATIONS

Most people are very happy with their vision following surgery. Although every effort is made to achieve the best possible visual outcome, I cannot guarantee that you will be satisfied with your vision following surgery.

Questions for your consultation

- Which lens best suits my eyes and daily activities?
- Will I benefit from a toric version?
- For which tasks should I expect to wear glasses?
- What are the contrast and night-driving compromises of this specific lens?
- What happens if the final prescription or visual quality disappoints me?

This leaflet supports an informed discussion. Reading or acknowledging it does not waive or restrict your legal rights and does not replace the consent discussion with your surgeon.

Selected sources

Pusnik A, Petrovski G, Lumi X. Dysphotopsias or unwanted visual phenomena after cataract surgery. *Life.* 2023;13:53. doi:10.3390/life13010053. Background review; illustrations in this leaflet are original schematics.

ESCRS Patient Portal: Cataract surgery and IOL choices.

ESCRS Recommendations for Cataract Surgery - optical designs, suitability and toric assessment.

Moorfields Private: Cataract lens implant options.

Alcon: Clareon Vivity product information and contrast warning; Alcon: PanOptix focal distances. Model-specific examples, not endorsements or individual predictions.

Sources accessed 23 October 2026. George Voyatzis FRCOphth, Consultant Ophthalmic Surgeon. Moorfields Eye Hospital / Moorfields Private.