Multifocal and Accommodative IOLs

What is an IOL?

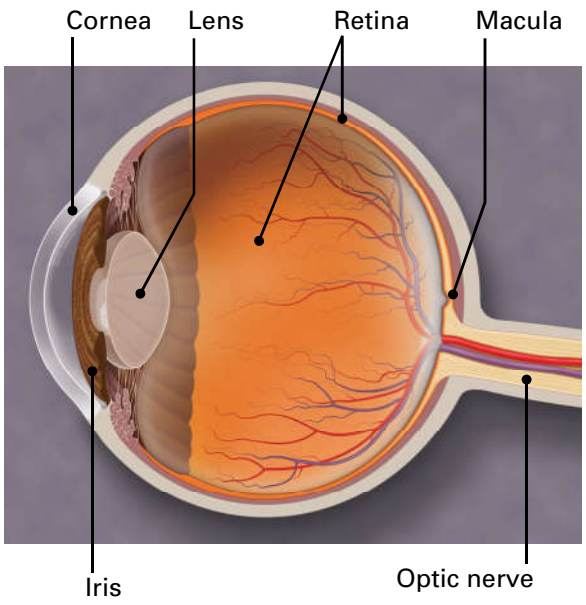
An intraocular lens (or IOL) is a tiny, artificial lens for the eye. It replaces the eye's natural lens.

The eye's normally clear lens bends (refracts) light rays that enter the eye, helping us to see. If your lens has problems, light will not refract properly. An IOL will refract light properly again, giving you clear vision at certain distances. IOLs come in different focusing powers, just like prescription eyeglasses or contact lenses.

If you have a cataract, your lens has become cloudy. Things look blurry, hazy or less colorful with a cataract. Cataract surgery removes this cloudy lens and replaces it with a clear IOL to improve your vision.

Some people without a cataract choose to replace their natural lens with an IOL. This is called a refractive lens exchange (RLE). This allows them to have an IOL that corrects a refractive error (nearsightedness, farsightedness, or astigmatism).

Most IOLs are made of silicone or acrylic. They are also coated with a special material to help protect your eyes from the sun's harmful ultraviolet (UV) rays.



Eye Words to Know

Lens: Clear part of the eye behind the colored iris. It helps to focus light on the retina (back of the eye) so you can see.

Cornea: Clear, dome-shaped window of the front of your eye. It focuses light into your eye.

IOL focusing power

The most common type of lens used with cataract surgery is called a **monofocal** IOL. It has one focusing distance. It is set to focus for up close, medium range or distance vision. Most people have them set for clear distance vision. Then they wear eyeglasses for reading or close work.

People who want to be less dependent on eyeglasses might want to consider other IOLs. Two types, **multifocal** and **accommodative** IOLs, offer different focusing powers within the same lens. These IOLs reduce your dependence on glasses by giving you clear vision for more than one set distance. Here's how they work.

Multifocal IOLs: Provide both distance and near focus. The lens has several rings or zones set at different powers. With this design, you are actually using both near and far vision at the same time. However, your brain learns to automatically select the right focus for what you want to see.

Accommodative IOLs: Similar to how your eye's natural lens changes shape to see at different distances, this type moves or changes shape to bring objects into focus at different distances.

These lenses have multiple zones (top image) or rings (bottom image). Each zone or ring is set for a different focusing power.

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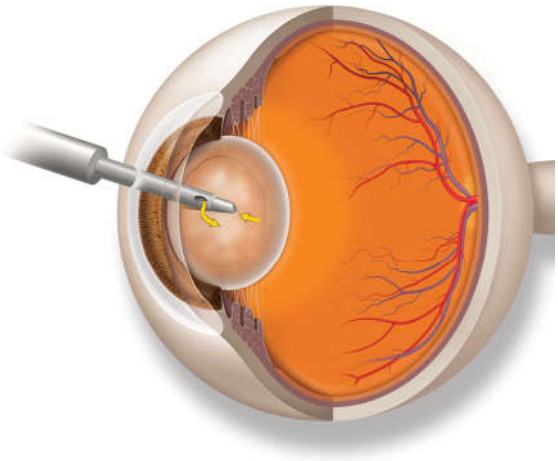
Content last reviewed 03/19

Setting your IOL's focusing power

Your eye surgeon will take measurements in and on your eye before surgery. These measurements are used to decide the correct power of IOL to use.

Things that are measured include your:

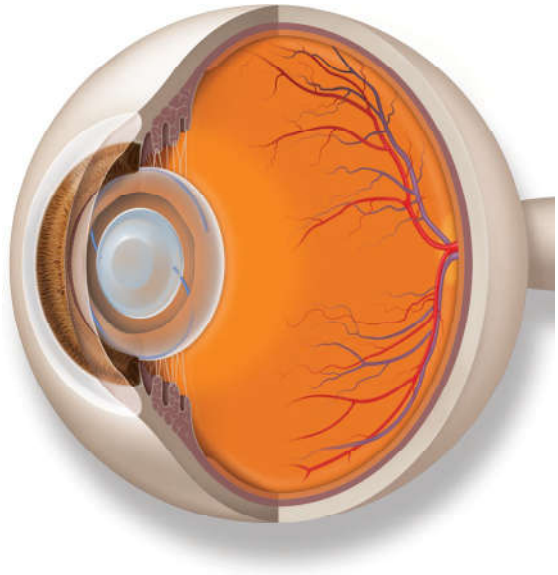
- refractive error (nearsightedness, farsightedness, astigmatism or presbyopia)
- pupil size and function
- corneal curvature and shape
- eye length from cornea to retina



To place an artificial lens (IOL) in your eye, your natural lens is removed first through an incision.

How an IOL is put in your eye

- Your eye surgeon will numb your eye with a topical or local anesthesia.
- He or she will make 1–3 tiny incisions near the edge of the cornea. These incisions allow your surgeon to work inside the eye.
- Using special instruments, your ophthalmologist will break up the center of the eye's natural lens. Then those pieces are gently vacuumed out through one of the incisions. The "capsular bag" that holds your natural lens in place is not taken out.
- The IOL is folded and inserted through the incision. It is placed in the "capsular bag," where it unfolds.
- The tiny incisions in your eye are usually "self-sealing," meaning you will not need stitches.



The IOL is then folded and inserted through the same incision.

It could take 6–8 weeks after surgery to be able to focus fully at all ranges. Basically, your eye has to relearn how to focus at various distances to see clearly.

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Possible risks of IOLs

There are possible risks and side effects with having an IOL implanted in your eye. Here are some of them:

- Your vision can be overcorrected or undercorrected (and you might need re-treatment).
- You could have an eye infection.
- You may get more floaters in your field of vision.
- You could have a retinal detachment (tissue at the back of your eye lifts up).
- Your IOL could move out of position.
- You may see halos and glare around lights.
- You could find it harder to see contrasting colors.
- You could develop clouding or hazing of part of the IOL, or of the capsular bag.
- Your vision could become blurry (especially if you have dry eyes).
- You may need additional surgery to fine-tune the IOL prescription.
- You could lose some of your vision.

Talk with your ophthalmologist about your vision needs.

There are benefits and drawbacks to surgery, eyeglasses and contact lenses. As you explore how to correct your vision, consider your vision needs and expectations. Your ophthalmologist will explain IOL options for you in more detail.

Who might not benefit from multifocal or accommodative IOLs?

With these IOLs, there are some visual side effects. For instance, your vision may be not be sharp in dim light or fog. You may also notice glare and rings (halos) around lights. For that reason, some people might not benefit from these IOLs. Pilots, night drivers or those who spend a lot of time in front of the computer may find these side effects cause problems.

Your ophthalmologist can help you choose a lens based on what you want and need from your vision.

Summary

Multifocal and accommodative IOLs (intraocular lenses) are types of artificial lenses that replace the eye's natural lens. They are usually implanted after a cloudy natural lens is removed in cataract surgery. Sometimes these IOLs are implanted only to correct refractive errors.

Multifocal and accommodative IOLs help make you less dependent on glasses by allowing you to focus at different distances.

There are side effects with multifocal and accommodative IOLs. For instance, your vision may be not be as sharp in dim light or fog, and you may also notice glare and halos around lights.

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When choosing a new lens, consider your lifestyle and vision needs.

If you have any questions about your eyes or your vision, speak with your ophthalmologist. He or she is committed to protecting your sight.

Watch an IOL video from the American Academy of Ophthalmology's EyeSmart program at **aao.org/iol-link**.

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