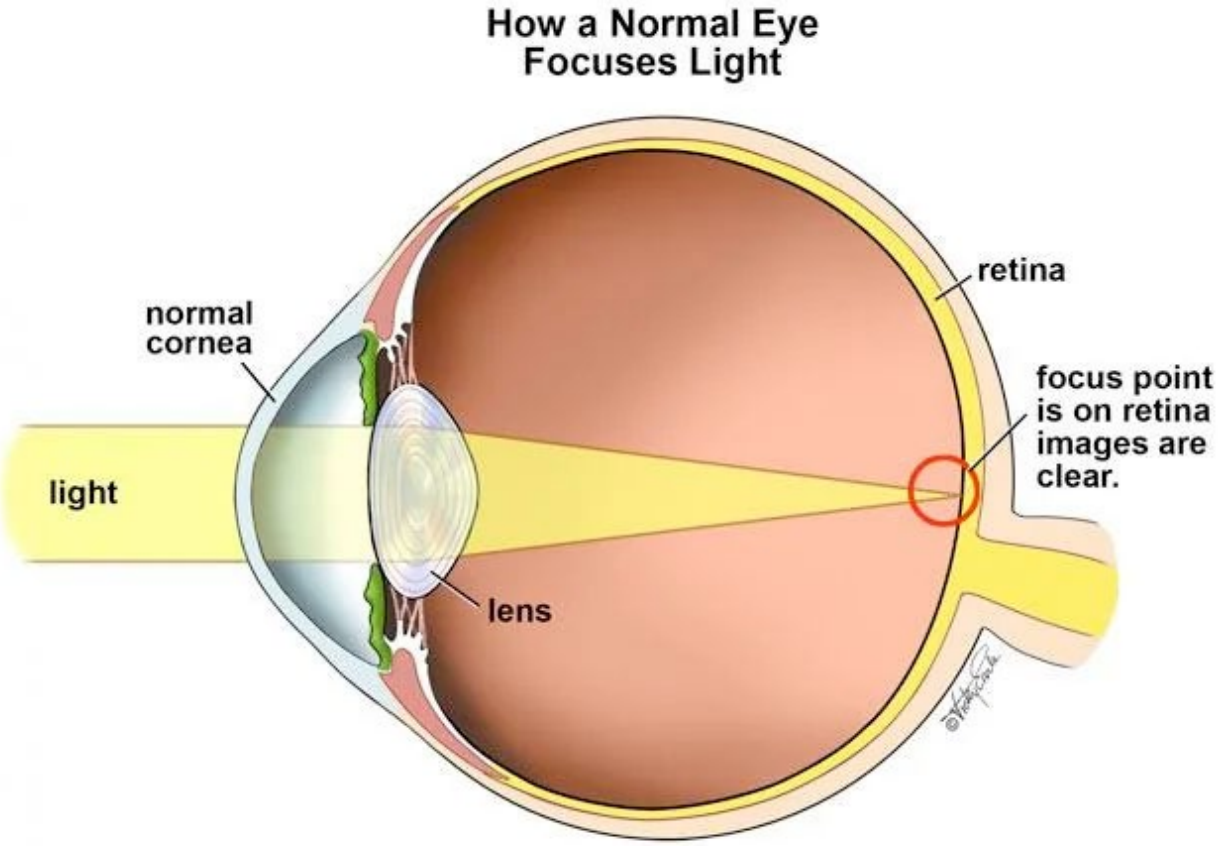
Normal function of the cornea and lens

In order to better understand your options for cataract surgery, it is important to review the normal function of the lens and cornea.

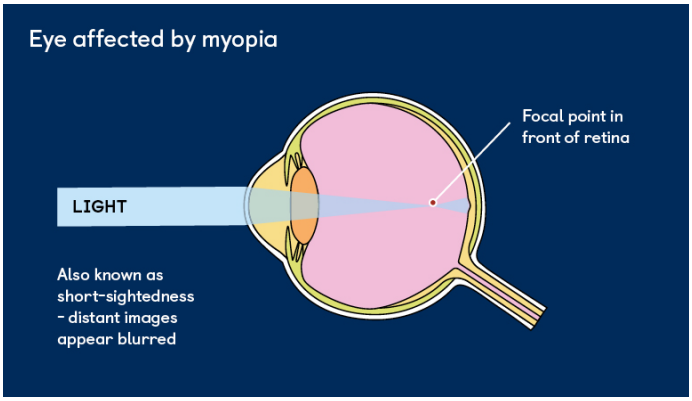
The **cornea** is the very front part of the eye, and is normally crystal clear. The cornea acts to bend and focus light rays, before they pass through the lens. Every cornea has a different focusing power.

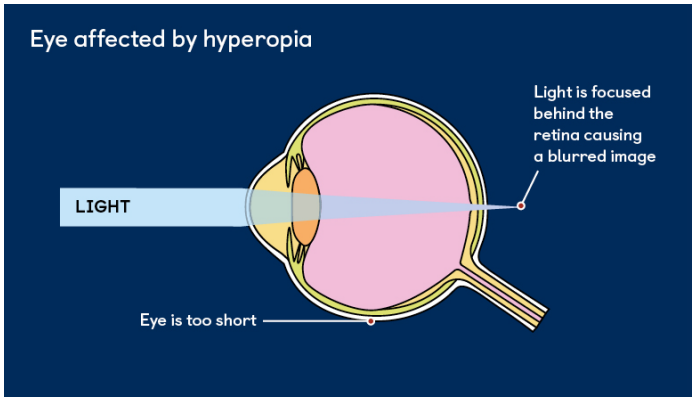
The next part of your eye that light rays pass through is the **lens**. A normal lens is clear, and allows light to pass through to your retina without obstruction. Additionally, your lens adds more focusing power, so that the light rays land on your retina to result in clear vision.



Refractive Error

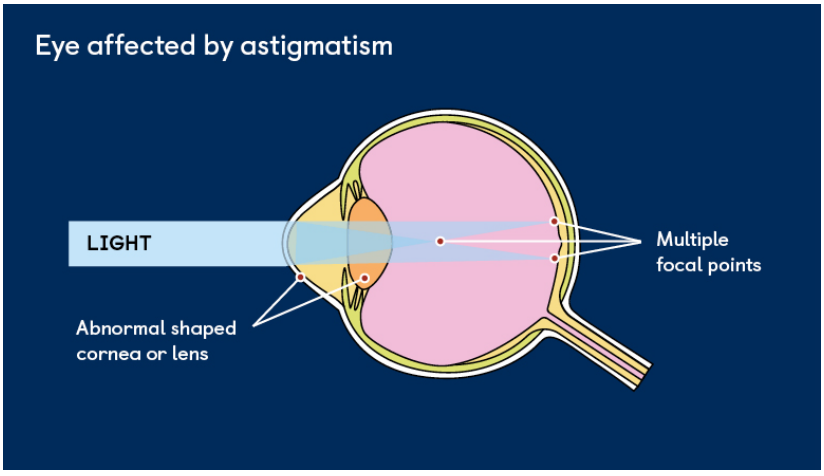
If there is a mismatch in your eye's focusing power, the light rays may land either in front of, or behind the retina. This is called **refractive error** - or being near-sighted/far sighted**,** and causes blurry vision. This is generally corrected with glasses or contact lenses.





Astigmatism

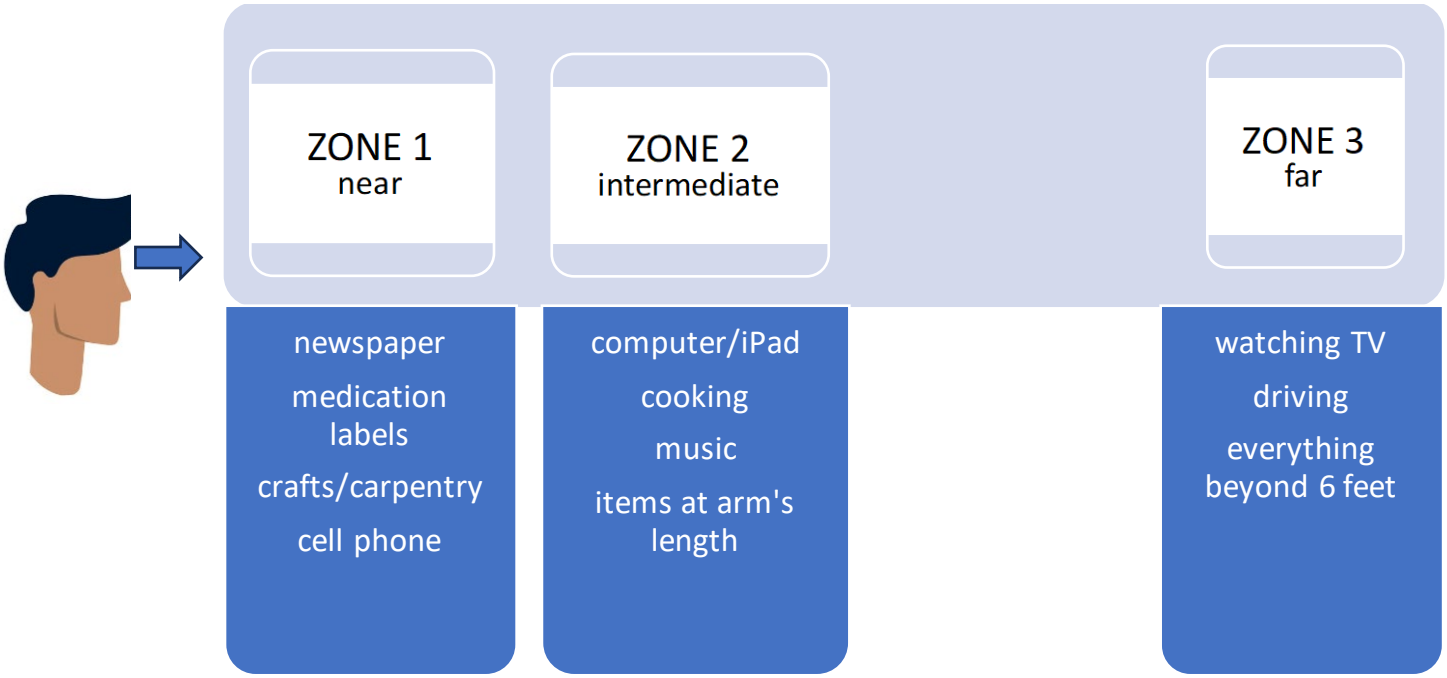
The normal cornea is round. Some people have more oval shaped corneas, and this is called **astigmatism.** This means that your cornea cannot focus light rays properly, and results in blurry vision. This is also generally corrected with glasses or contact lenses. There are different levels of astigmatism, generally classified as mild, moderate, or severe. Please note, astigmatism is generally not a true medical disease - it is simply your anatomy, and is actually quite common. Fortunately we have many options to correct astigmatism during cataract surgery (discussed later).



Normal age-related changes of the lens

With time, your lens changes in two important ways. The first is **Presbyopia**

The normal, young lens is flexible and can change shape, and thus adjust its focusing power when needed. When you look at things up close (computer, phone, reading), you need this additional focusing power to see clearly. The closer you need to see, the more focusing power that is needed. We can simplify this by defining 3 “zones of vision.”

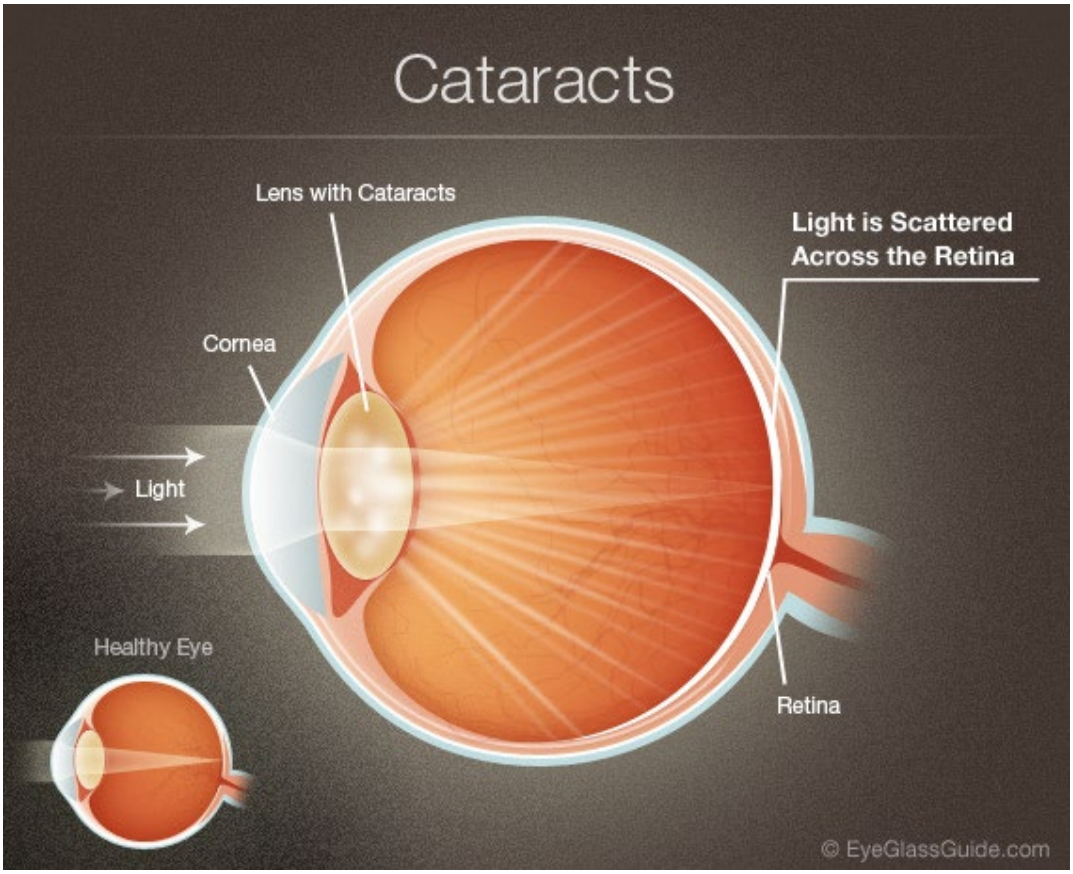


The young human lens can flex shape as needed - this is called lens accommodation. This results in clear vision in all zones without the need for glasses. If you are near-sighted (myopic), or if you have moderate/severe astigmatism, you need glasses or contacts for clear distance vision (zone 1). But your lens can accommodate, and you do not need bifocals.

With time, the normal human lens gradually loses its flexibility, and can no longer accommodate well. This process starts for most people in their 40s and is called **presbyopia**. Initially you require glasses for zone 1 (near), but you still have functional vision in zone 2 and 3 (distance and intermediate). With time, presbyopia worsens, and you will need glasses for zone 2 as well (intermediate). Eventually, many people need glasses even for zone 3 (distance). People who are presbyopic will often wear bifocals / progressive glasses. This allows you to see the different zones of vision, without having to take glasses on and off.

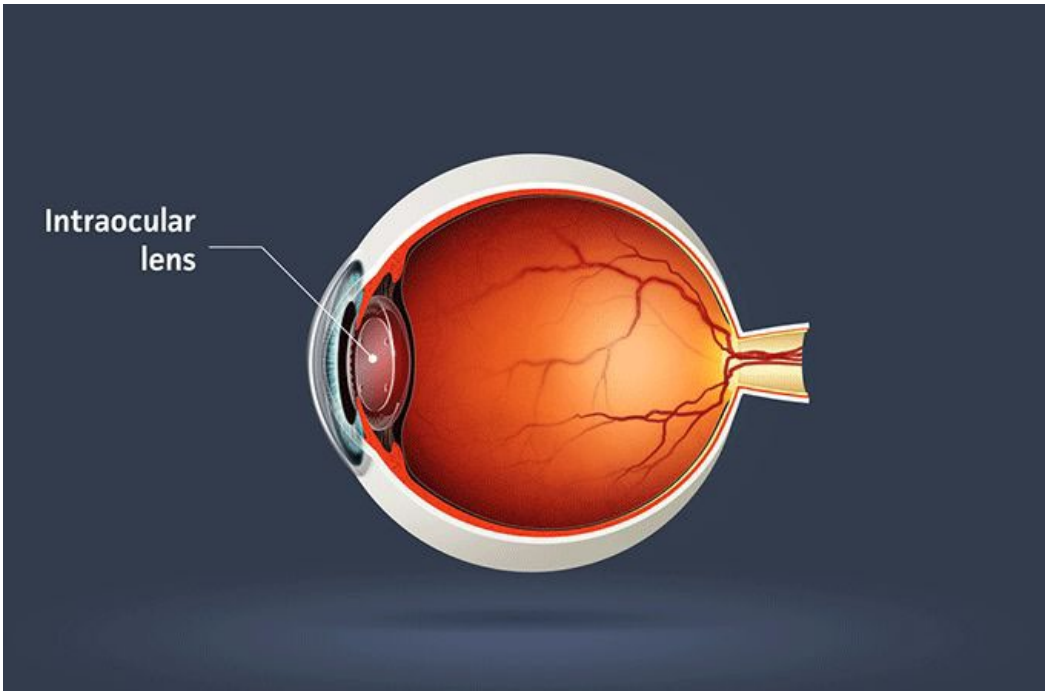
CATARACTS

The second important way your lens changes with time is the development of **cataracts.** The lens becomes cloudy and yellow, causing blurry vision and/or light sensitivity. Common symptoms include difficulty reading or watching TV, difficulty driving at night due to glare/haloes around headlights and streetlights, among others. While certain medical conditions can cause people to develop cataracts more rapidly, cataracts generally develop slowly over time, and are considered a normal aging process of the eye.



CATARACT SURGERY

Once your cataracts have progressed to a point where your vision is not correctable with glasses, it is time to consider **cataract surgery**. During cataract surgery, your surgeon will remove your cataract, and replace it with an **intraocular lens implant (IOL).** Your IOL is clear, and will allow light to pass through to the retina unobstructed, thereby improving your vision.



IOL OPTIONS

After cataract surgery, the two main focusing agents in your eye are now your **cornea** and **IOL**. With modern cataract surgery, you have options as to what type of IOL you choose. Please take a few minutes to read this memo and seriously think about your visual needs following cataract surgery. Once your IOL is implanted, it is permanent and lasts your entire lifetime – cataracts do not grow back. These are your eyes, and we will take care of them - your surgeon and staff will help guide you, however it is up to you to make the ultimate decision.

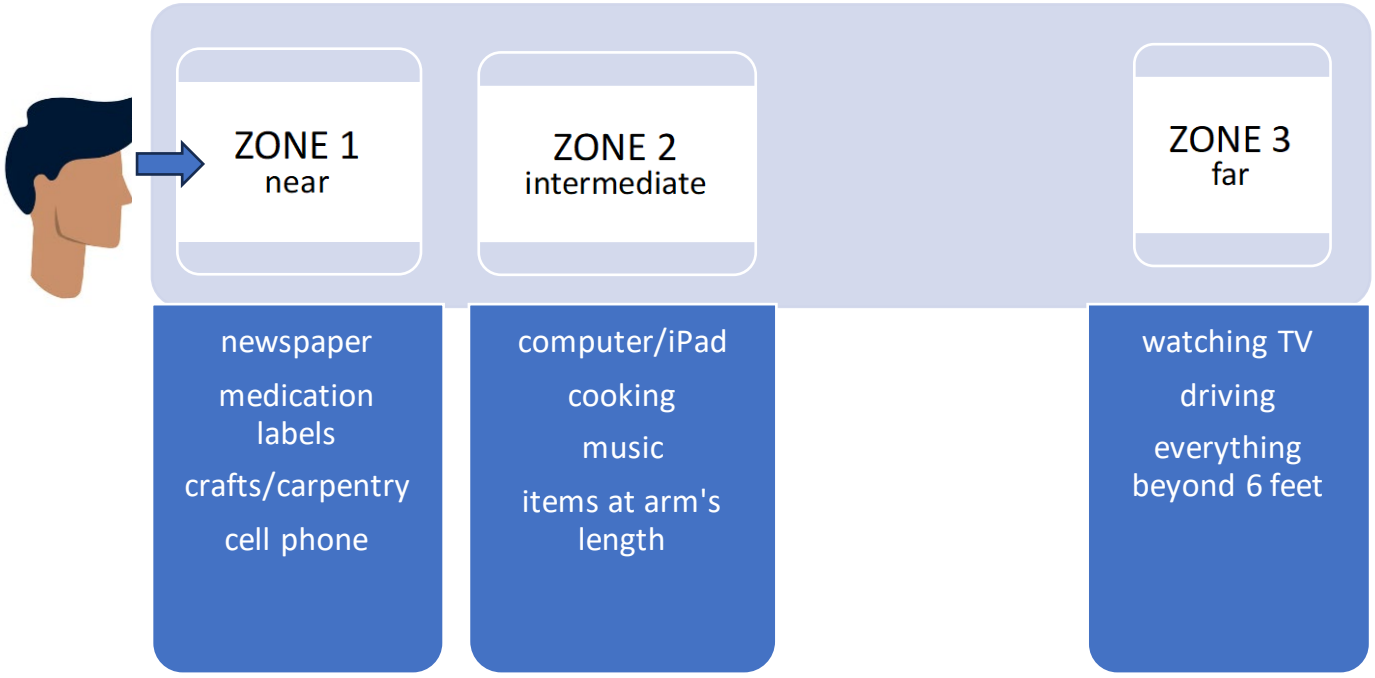
As you read through these options, it is important to keep in mind how much **corneal astigmatism** you have. We may not know exactly how much astigmatism you have, until we perform comprehensive measurements of your eye in our clinic.

Your level of astigmatism: ◊ **mild** ◊ **moderate** ◊ **severe**

Standard Surgery: Monofocal IOL

A traditional **monofocal IOL** will provide focusing power for one focal point / zone of vision (also called single focus IOL), and does not correct astigmatism. Patients who choose this lens must choose one focal point, and will require glasses for the other two zones of vision. Most patients prefer to have clear distance vision (zone 3), and thus will require glasses for all intermediate/near tasks (zones 1 and 2). Some patients who are naturally near sighted, prefer to choose a focal point in zone 1 or 2, and will then require glasses for distance (zone 3).

Standard monofocal IOLs do not correct astigmatism – **if you have astigmatism, then you will continue to need to wear glasses for all zones of vision**. In general, monofocal IOLs work best for people who do not mind wearing glasses most of the time. The cost of a monofocal IOL and standard surgery is covered by medical insurance.



ADVANCED TECHNOLOGY OPTIONS

If you decide to have advanced technology IOLs or laser assisted cataract surgery, additional tests will be performed prior to surgery to optimize your results. ***Medicare and all other commercial/federal insurance plans will not cover the cost of advanced technology lenses, laser assisted cataract surgery, or services related to them***.

Astigmatism Correction/Management-

We offer two different options to manage astigmatism at the time of cataract surgery. Astigmatism correction is not covered by any medical insurance.

- ☐ ***Laser Arcuate Keratotomy***:
  This is a refractive surgical procedure to correct **mild** amounts of astigmatism. Laser guided, partial thickness incisions are made on the cornea to correct your astigmatism, and a standard monofocal IOL is implanted.

- ☐ ***Astigmatism-Correcting Toric IOLs***
  This type of IOL is for patients with **moderate or severe** astigmatism. The toric IOL is implanted and aligned at a specific orientation.

  The intended result of either of the above options is to provide clear vision, without glasses, in your chosen focal point/zone of vision. Thus, you will still require glasses for the other two zones of vision.

Multifocal IOLs:

While standard and toric IOLs provide a single focal point, multifocal IOLs are designed to provide clear vision across multiple focal points. When these IOLs are used in both eyes, approximately 85% of patients find that they do not need glasses for either distance or near activities. Multifocal IOLs can treat **all ranges** of astigmatism. Presently, we offer 2 different types of multifocal IOLs. Multifocal IOLs are not covered by insurance.

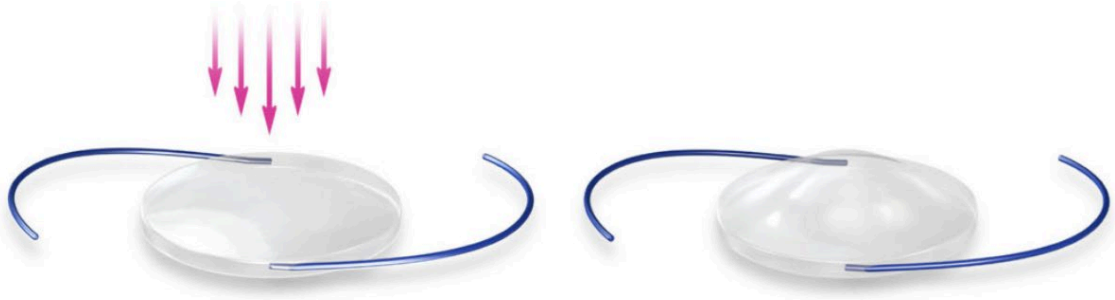
- ☐ ***Panoptix Trifocal IOL***
  This IOL provides clear vision at distance, intermediate, and near. This IOL works best in people who have no other eye disease, and want the most visual flexibility without relying on glasses. Some people (20%) report mild halos or glare around lights. But most patients report that the ability to have a full range of vision without glasses, far outweighs these visual side effects.

- ☐ ***Vivity Extended Depth of Focus IOL***
  This IOL provides clear vision at distance and intermediate, and most patients will require reading glasses for near tasks (small print). This lens has minimal risk of glare and halos. This IOL works well for people who value flexibility from full time use of glasses, and do not want the risk of night time glare/haloes that comes with the panoptix trifocal IOL. This IOL also works well for people with other eye disease, and who still want an extended range of vision IOL.

Light Adjustable Lens

Before surgery, our staff will take comprehensive measurements of your eye. We then run these measurements through advanced formulas, which we use to predict your IOL power that will correct your vision accordingly. While these formulas are quite accurate, they are far from perfect. There are many variables in the process that can result in the IOL power not being perfectly matched to your visual needs. Traditional IOLs (including toric and multifocal IOLs) are fixed power IOLs – this means that they cannot be changed/altered once they are placed in your eye. Thus, if there is a mismatch, your only options for correction are glasses or LASIK.

The **Light Adjustable Lens (LAL)** is the first and only IOL that can be adjusted in power, after it has been implanted into your eye. After your eyes have fully healed from surgery and the IOL is stable (approximately 2-3 weeks), our team performs a full analysis of your vision, including an in depth discussion of your visual needs. We then use a non-invasive, UV light in the office to adjust the power of your IOLs accordingly, up to 3 times. This allows you to "test drive" your vision, and results in the highest chance of your lens power being perfectly tailored to your visual needs.

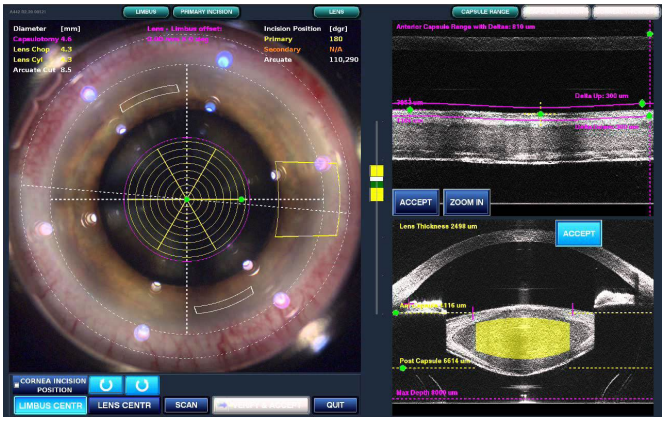


UV light exposure

modified shape

Laser Assisted Cataract Surgery

Regardless of what type of IOL is being used most patients are good candidates for laser assisted cataract surgery. Using a computer guided femtosecond laser platform, your surgeon will complete the most delicate parts of the cataract surgery within 30 seconds. You will then be taken immediately to the operating room, where the residual cataract material is vacuumed out, and your IOL inserted. Benefits include the ability to perform more precise astigmatism treatment, a perfectly centered IOL, and decreased manipulation and ultrasound energy used during cataract removal. Laser cataract surgery is not covered by medical insurance.



How does the cataract evaluation process work?

After you have been diagnosed with a cataract that is ready for surgery, you will be scheduled for a comprehensive cataract surgery planning visit - this takes place in the office, and generally does not require repeat dilation of the eyes. During this visit, our team will perform detailed biometric measurements of your eyes, as well as any other necessary testing. You will then review the measurements with your surgeon, who will help you pick your intraocular lens that best suits your visual goals. You will also speak with our surgical coordinators, who will review the details of the process, and schedule a date for surgery. Many patients find it helpful to bring a friend or family member who can help with the decision making and surgery scheduling process.

Please note - your actual cataract surgery will take place on another date, at a dedicated ambulatory surgery center.

What to expect on the day of surgery

Upon arrival at the surgery center, you will check in and be taken to the pre-operative area. Here, you will receive an IV, and your surgical eye will be dilated. You will also meet the various members of your surgical team, including nursing staff, and your anesthetist. During your surgery, you will likely receive light IV sedation to keep you relaxed. After your surgery has been completed, your eye will be covered. Your IV will be removed, and you will be discharged home with detailed instructions, as well as contact information for our office should you have any problems. Please expect this whole process to take between 2-3 hours.

What is recovery like?

Most patients experience an uneventful recovery from cataract surgery. You will see your surgeon at Maryland Eye Consultants the day after surgery for a postoperative check. Many patients have much improved vision on day 1 after surgery, but it may take a few days to a few weeks for you to realize the full visual benefits. We will provide you with some basic activity restrictions, including no heavy lifting (approximately 20 pounds), and no bending your head below the level of your waist, for 1 week after surgery. Most patients are able to care for themselves, and self administer the prescribed eye drops. You will receive a new prescription for glasses approximately 1 month after your surgery, after your eye has had a chance to fully heal. Most patients are able to use inexpensive over the counter reading glasses for up close tasks during the first month after surgery.