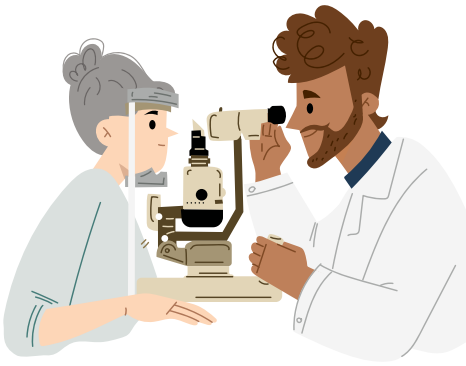
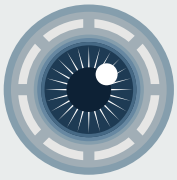
See The Possibilities

Things to think about as you consider cataract surgery



You are going to have cataract surgery – in this safe procedure, your ophthalmologist will remove the cloudy natural lens from your eye and will replace it with an artificial one.



You will be presented with options regarding:

- what **type of lens** the ophthalmologist will use to help you regain your sight
- the **testing** that is done before surgery
- **how the surgery** is done

Your ophthalmologist is an expert in both medical and surgical eye diseases and will help guide you through the planning of your surgery, including recommending what would best optimize your surgery given your ocular health.

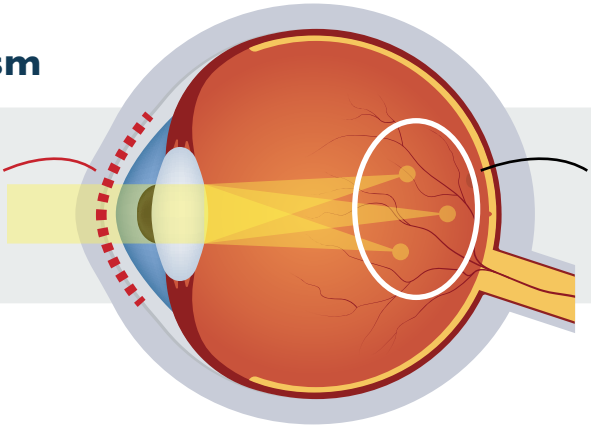
The purpose of this guide is to provide you with information about the options available to you and to help prepare you for a conversation with your ophthalmologist.

To learn more about cataracts and how they are removed, visit the See The Possibilities website here.

Important information to help you understand lens options

The cornea, which does most of the focusing of light in our eye, is rarely perfectly round. Because of this, light is not focused as sharply as it could be. The medical term for this is **astigmatism**. While small amounts of astigmatism do not affect vision, larger amounts need to be corrected to allow clear vision. This is typically done with glasses, however, certain artificial lens options can correct astigmatism, reducing the need for glasses after cataract surgery.

Eye with astigmatism



Contrast sensitivity is the ability to see subtle differences in the shade of colour of an object and detect fine surface details. This is slowly lost as cataracts develop but is also lost from retinal diseases like macular degeneration and from glaucoma. Certain types of lens implants reduce contrast as well and are not a good choice in people who have these diseases.

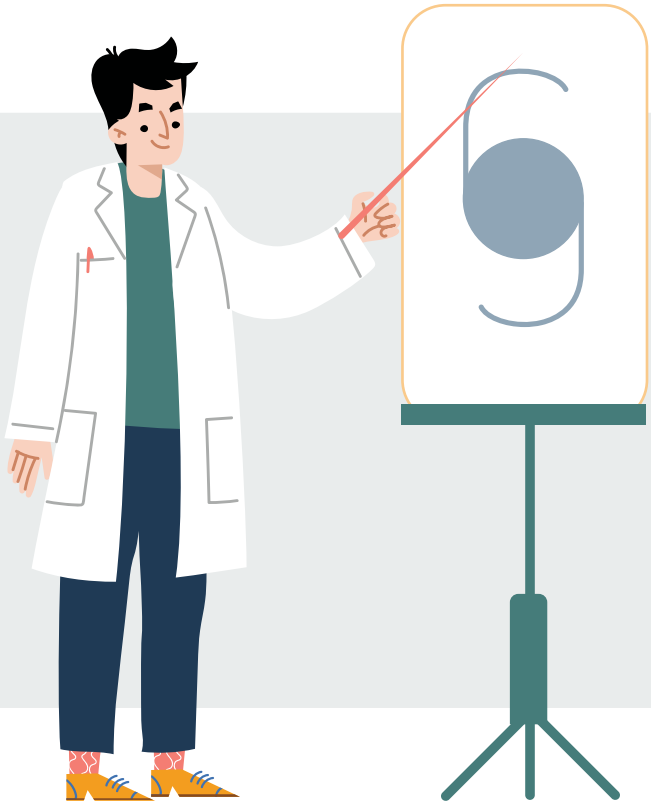
Normal vision

Vision with cataracts causing cloudy vision and reduced contrast sensitivity

Your ophthalmologist will recommend the best lens and surgical options for you based on your overall eye health.

What different types of artificial lenses (intraocular lens implants) are available?

There are several intraocular lens implant options that are used to replace the natural lens of your eye that has become cloudy over time. These range from "standard" lenses to added-feature lenses (sometimes termed "premium" lenses). Read on to learn more about each of the lenses.



Standard lenses

A standard "spheric" lens implant typically produces good vision at distance in a healthy, normal eye. However, the range of focus with this lens is like what many people experience when they reach middle age – under most conditions, you will still need to wear reading glasses to read or use your computer. You may still require a mild prescription for distance as well, depending on how your eye heals.

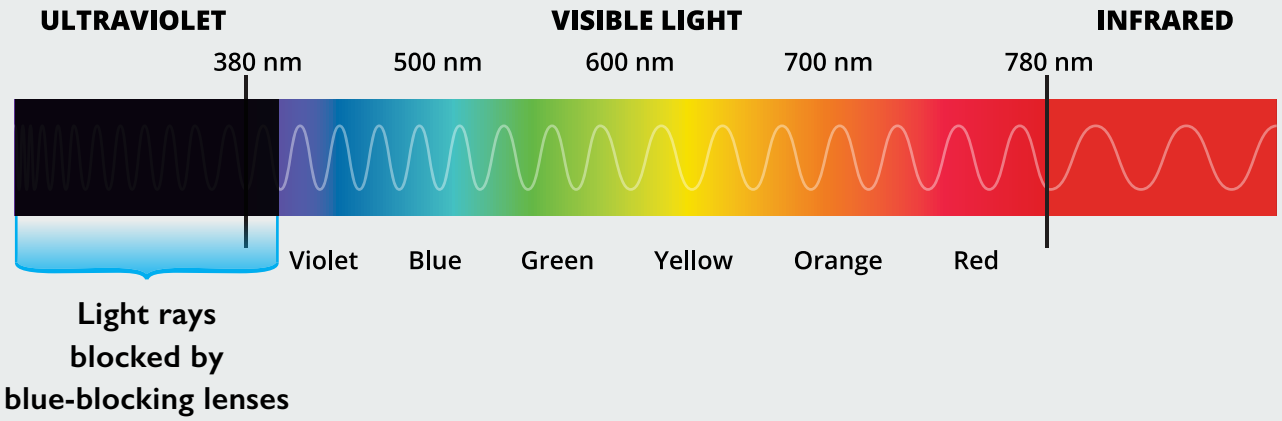
Your provincial health plan will cover the cost of implanting these "standard" lenses and the standard testing needed to select the correct lens strength. You have the option to pay for additional measurements to prepare for your surgery.

What are premium lenses?

"Premium" lenses offer additional features not typically present in the "standard" lens. If you wish to have a "premium" lens implanted, you will be asked to pay an extra fee to cover the additional cost of the lenses and any additional tests that are required. These fees may be different in each province.

Blue-blocking lenses

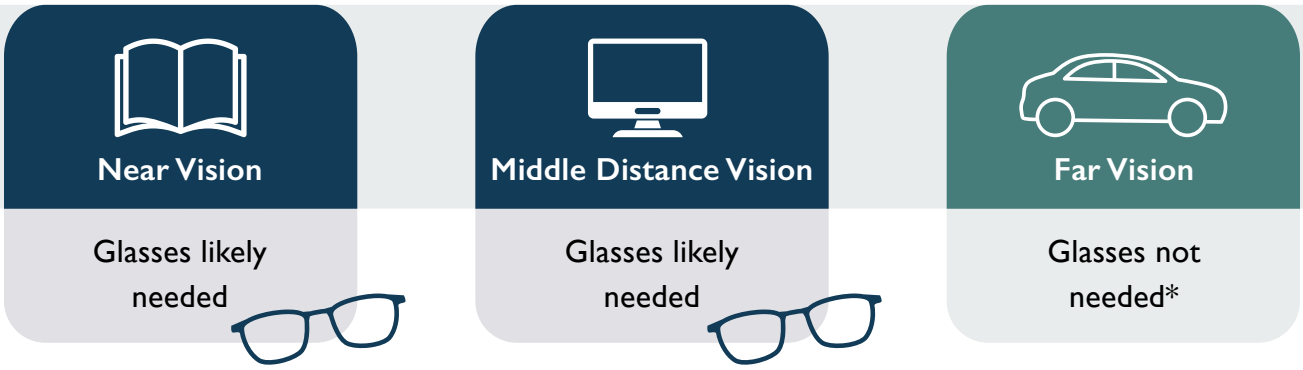
Modern lens implants block ultraviolet light from reaching the retina. "Blue-blocking" lenses also block light rays in the near ultraviolet end of the spectrum. There is some evidence that this may provide greater protection to the aging retina, but the magnitude of this benefit is not clear.



Aspheric lenses

"Aspheric" lenses may provide better clarity and depth of focus when the pupil of the eye is wider, such as in low light situations. They may also reduce glare.

Vision after cataract surgery with spheric, aspheric, and toric lenses



*You may still require a mild prescription for distance vision, depending on how your eye heals.

Spheric, blue-blocking, and aspheric lenses can be selected without the need for additional testing beyond the standard measurements covered by all provinces (see below).

Toric lenses

"Toric" lenses correct astigmatism produced by the cornea. These lenses are beneficial in eyes with moderate to high astigmatism when the goal is to reduce or eliminate dependence on glasses for good vision. These lenses require special techniques at the time of cataract surgery and are dependent on additional testing before surgery to be beneficial. An explanation of the tests is included later in this document.

Extended depth of focus lenses

"Extended depth of focus" lenses increase the range of distances that a relatively clear image can be placed onto the retina. They reduce the need for glasses at far and intermediate (computer) distances, but for most reading and prolonged near activity, glasses are typically still required. These lenses need additional testing before surgery. It's important to understand that these lenses reduce contrast, so they may not be a good choice for eyes with macular degeneration or glaucoma. Under lower light conditions, halos and glare can be a problem, so people who regularly drive at night are not likely to be happy with this choice.

Vision after cataract surgery with extended depth of focus lenses

Near Vision	Middle Distance Vision	Far Vision
Glasses needed for fine print and most reading	Glasses seldom needed	Glasses not needed*

*You may still require a mild prescription for distance vision, depending on how your eye heals.

Multifocal lenses

"Multifocal" lenses attempt to provide reasonable vision at distance and near without the need for glasses. Many different designs exist. There is no guarantee that any of these designs will eliminate the need for glasses. All multifocal lenses reduce contrast to some degree and are not a good choice for patients with glaucoma or macular degeneration. Halos and glare may be a problem during night driving. All require additional testing prior to surgery.

Vision after cataract surgery with multifocal lenses

Near Vision	Middle Distance Vision	Far Vision
Glasses still needed for some patients	Glasses seldom needed	Glasses not needed*

*You may still require a mild prescription for distance vision, depending on how your eye heals.

What kinds of tests will need to be done before surgery?

There are several tests that are required before surgery. Requirements differ depending on the health of your eye, your history of prior eye surgery, and the lens option chosen.

During the evaluation process for cataract surgery, a complete eye history and examination will be done. Features of your eye that may impact the surgery or the choice of lens to be used will be noted.

To determine the focusing power of the artificial lens so that it places light in sharp focus on the part of your retina that helps you see most clearly, testing needs to be done to determine the length of the eye from the cornea to the retina and the focusing power of the cornea.

Keratometry	A-scan biometry
Measures the curvature of the central cornea	Uses an ultrasound to measure the length of the eye

These tests are accurate enough to give good results with standard, blue-blocking, and aspheric lenses in eyes of normal length and in people who have healthy corneas. If you have previously had laser vision correction on your eyes to reduce the need for glasses, you may need additional tests to ensure accuracy of these measurements, since the shape of cornea is now different than it was before your laser treatment.

Other/Special Tests

OCT (optical coherence tomography)

- A non-invasive test that uses light waves to take cross-section pictures of your retina
- May be ordered if there is any question about the health of the retina

Corneal tomography and corneal topography

- Provide a contour map of the cornea; are useful to gain a better understanding of how the cornea bends light
- May be used if the cornea has been previously injured or if corneal surgery (e.g., laser vision correction) has previously been done

Intraocular pressure testing and evaluation of the optic nerve and visual field

- May be done in eyes with glaucoma

Laser biometry

- These machines give more precise measurements than standard keratometry and A-scan measurements, including the length of the eye and corneal curvatures. Measurements using this technology are especially helpful for eyes that are either very long or very short, or eyes that have had laser vision correction
- This extra accuracy is especially important if certain lens types will be used:
  - Astigmatism correction lens (toric lens)
  - Lens that helps with focus at different distances (multifocal lens or extended depth of focus lens)

What surgical options are available for cataract surgery?

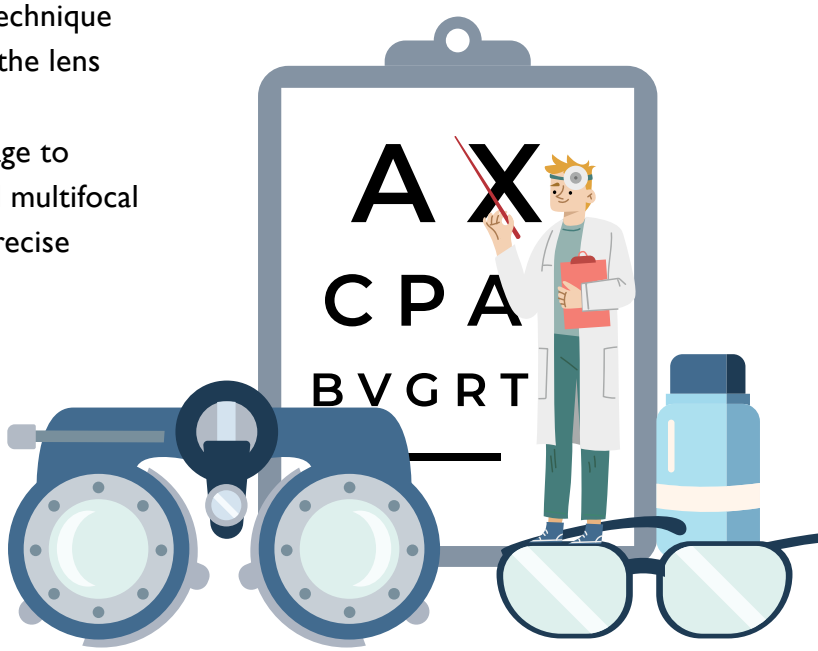
There are some additional surgical options available to you beyond the standard procedure.

Femtosecond laser-assisted cataract surgery, also referred to as "femto"

- Uses a laser to create the surgical wound and the opening into the lens
  - The wound creation is more precise, and the lens opening can be centered and sized with greater precision using this technique
- Sometimes it is also used to break up some of the lens material during surgery
- To date, studies do not demonstrate an advantage to this technique except in the setting of toric and multifocal lens use where lens positioning may be more precise

Cataract and laser refractive surgery

- A combined approach where cataract surgery is followed by corneal laser refractive surgery (vision correction)
- The second surgery is performed after you have healed from your cataract surgery, to "fine-tune" the focusing of the eye to reduce the use of glasses if needed



At a glance: cataract surgery lens implant options

LENS TYPE	FEATURES	CONSIDERATIONS	ADDITIONAL TESTING NEEDED
STANDARD LENSES			
Spheric lenses	• Provide good distance vision with minimal or no glasses	• Glasses likely still needed for reading/computer use	No
PREMIUM LENSES			
Blue-blocking lenses	• Block blue light (light rays in the near ultraviolet end of the spectrum), which may help protect the retina	• It is not clear how much blocking blue light helps eye health	No
Aspheric lenses	• May provide better clarity and depth of focus in low light situations • May also reduce glare	N/A	No
Toric lenses	• Correct astigmatism • Can help reduce or eliminate dependence on glasses in eyes with moderate to high astigmatism	• Special surgical techniques (femtosecond laser-assisted cataract surgery) can be used to help position the lens more precisely but are not required	Yes (laser biometry is required)
Extended depth of focus lenses	• Increase the range of distance of clear vision • Reduce the need for glasses for intermediate and distance vision	• Glasses typically still required for most reading/near activity • Reduce contrast; may not be a good choice for eyes with macular degeneration or glaucoma • Halos and glare can be a problem under low light conditions	Yes (laser biometry is required)
Multifocal lenses	• Reduce the need for glasses at both near and distance vision	• Reduce contrast; not a good option for patients with macular degeneration or glaucoma • Halos and glare can be a problem during night driving • Femtosecond laser can be used to help position the lens more precisely but is not required	Yes (laser biometry is required)

What are the next steps in decision-making for your cataract surgery?

If you haven't already, you will receive a referral to an ophthalmologist for further examination and to set a date for surgery

- Your ophthalmologist will cover in detail what to expect during the procedure and after the surgery, including potential risks and complications
- They will also discuss what lens and testing options are available to you and provide recommendations as well as potential costs, if any

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See The Possibilities

See The Possibilities
A resource for the Canadian public on the topics of vision health, serious eye diseases, and what COS is doing to promote eye health for everyone. Visit us at www.seethepossibilities.ca.

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