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So, You Have A Cataract…

WHAT IS A CATARACT?
Every year the lens in your eye that helps you see gets thicker. In your forties, the lens is thick enough that it doesn't change its shape well enough to focus on near objects and is referred to as a cataract. So, the day you need reading glasses, (or if you are nearsighted, the day you are forced to take your glasses off to read), is the day you have a cataract by definition. As the cataract becomes denser, you need stronger reading glasses or bifocals. Eventually you feel you are not seeing as well as you used to for viewing things in the distance, reading or doing close work, or for driving at night or in bad weather despite the best glasses. Once this occurs, you become a candidate for cataract surgery.

WHAT IS CATARACT SURGERY?
Cataract surgery is lens replacement surgery. Before surgery, measurements are made to determine what lens power needs to be placed in your eye to help improve your vision. Special equipment is used in the surgery center to remove the cataract and a new lens is placed in your eye. Today's technology allows you to choose what type of lens you want implanted.

STANDARD – DISTANCE
With "Standard" cataract surgery, a monofocal lens is implanted. This means the lens has one focal point (i.e. the lens focuses the eye to see in the distance OR at near for reading but not both). Most people choose to see in the distance. We call this option **"Standard Cataract Surgery - Distance Lens."** If you choose it, you WILL need glasses to read, use the computer, see your cell phone, or do any close work. Often, over-the-counter glasses can be used for these near vision tasks; however, if you have astigmatism (more on this later…) and select this option, you WILL need glasses to see in the distance as well as to read due to your astigmatism.

STANDARD – READING
Some people are naturally about 2 or 3 diopters nearsighted. They use glasses to see in the distance but love reading without glasses. Some of these people desire to continue with this type of vision after their surgery. If you select this option which we call **"Standard Cataract Surgery - Reading Lens**", your eyes will be focused to read but your distance vision without glasses will be blurry and you will need to wear glasses to see in the distance, drive, play golf, watch TV, etc. I only perform this type of surgery on people who have lived this way their entire lives – glasses on for everything except reading. Again, if you have astigmatism and select this option, you may still need glasses for near tasks as well as to see in the distance.

MONOVISION CATARACT SURGERY
Some people have successfully worn monovision contact lenses. With monovision, one eye sees in the distance and the other eye focuses to read. The dominant eye works best as the distance eye. Tests can be done in the office to determine ocular dominance. **"Monovision Cataract Surgery"** is surgery in which a monofocal lens is put in each eye. The power of these lenses is such that the dominant eye will focus in the distance and the non-dominant eye will focus to read. Many people who have natural monovision or who are successful monovision contact lens patients select this option as they are used to seeing this way. If you are interested in this option and if your preoperative vision is not too poor in one or both eyes from cataract formation, a monovision contact lens trial can be arranged preoperatively. Generally, I operate on the dominant eye first for distance and then see how the postop vision turns out. If you are happy with your postoperative distance vision, we can place a contact lens in your non-dominant eye in the morning that will make that eye blurry in the distance but able to see near objects. You return later in the day and

let me know how you liked your day with monovision. If you like it, we can do it surgically..

WHAT IF I HAVE ASTIGMATISM?
The outcome in each of the above cases assumes that patients have less than half of a diopter of corneal astigmatism. If you have more than this, astigmatism may limit your vision (distance or near) without glasses. Corneal astigmatism is an irregular curvature of the cornea. This is common and most people have a small amount of it. The astigmatic cornea is not round like a basketball (no astigmatism) but rather has a curve in one direction and another curve in the other - like a football. This causes vision to be blurry without glasses. Therefore, people with astigmatism who get "Standard Distance Surgery" WILL need glasses to fine tune their distance vision (as well as to read). Many of these patients would prefer to have better vision in the distance with a decreased dependency on glasses.

The **Toric Intraocular Lens (astigmatism correcting intraocular lens)** gives them that option. By positioning the lens on the steep axis of a patient's astigmatism, the astigmatism is reduced. The Toric lens can be inserted at the time of cataract surgery if you desire distance vision only, reading vision only, or monovision. If you have astigmatism and are choosing one of these options, ask if the Toric intraocular lens is right for you. The correction of astigmatism is a non-covered service and no insurance companies (including Medicare) will pay for it.

Special incisions called **Limbal Relaxing Incisions or LRIs** can also be made in the cornea at the time of surgery to decrease corneal astigmatism. Toric lenses now reliably correct larger amounts of astigmatism so this technique is most often used when smaller amounts of astigmatism are required. They are also not covered by insurance. For well over 10 years, I performed astigmatism-reducing limbal relaxing incisions using a special diamond blade. This procedure has become even more precise by using the **femtosecond laser**.

FEMTOSECOND LASER OPTION
The **femtosecond laser** is an amazing machine that can make the necessary incisions into the eye that are required to remove the cataract. It can also make a perfectly round hole in the anterior capsule of any size I select. This hole which is called a continuous curvilinear capsulorhexis (CCC) is again necessary to remove the cataract. Studies have shown that refractive outcomes are better when the CCC is about 5 mm in diameter and well centered so that it overlaps the new lens that will be implanted in the eye. These intraocular lenses are often 6 mm in diameter. The laser can also be used to break up the cataract into smaller pieces. This allows less ultrasound energy to be used which may be safer for the health of the cornea. The femtosecond laser is especially helpful if your cataract is very dense or if you have a weakness in your capsule called pseudoexfoliation. Finally, the **femtosecond laser** can perform Limbal relaxing incisions which reduce astigmatism allowing better uncorrected vision.

OPTIMAL REFRACTIVE RESULTS (ORA)
There is now a technology that can measure the refractive error in the eye once the cataract has been removed while you are still on the operating table. This may become the most accurate method of determining what power lens should be placed in your eye to give you your desired refractive result. This device is called the **ORA**. It is not perfect but may give you the best chance of achieving your desired visual outcome. I think it is an option worth considering for everyone. I highly recommend it if you have had prior refractive surgery such as Lasik, PRK etc.

PREMIUM LENS OPTIONS
Some patients are interested in trying to see in the Distance AND at Near with both eyes simultaneously (Not Monovision) without wearing glasses. Options for this include – **Trifocal Lens (PanOptix Lens)**

Cataract Surgery, Extended Depth of Focus Lens (Symfony Lens) Cataract Surgery, **Bifocal Lens (formerly Multifocal Lens) Cataract Surgery,** and **Crystalens Cataract Surgery**. These lenses are lens implants that correct vision for both distance and near. As a result, patients that have these lenses placed are far less dependent on glasses than patients who undergo standard cataract surgery. While these are very good options, patients will still need to make some compromises. There are no lenses available that make you see like you did when you were eighteen.

PREMIUM COMBINATIONS

While health insurances, including Medicare, cover standard cataract surgery and the placement of a monofocal lens, they will not pay the additional cost for **trifocal lenses (PanOptix), extended depth of focus lenses (Symfony)**, **bifocal lenses** or the **Crystalens** or the additional expenses associated with the procedure including the possibility of using the **femtosecond laser** and **ORA**. I believe the best results are often achieved with a premium lens combined with the use of the femtosecond laser and ORA. <u>If you don't mind wearing glasses, or want to wear glasses after surgery then these procedures are not necessary.</u> If your goal after cataract surgery is to decrease your dependence on glasses, you will want to consider these premium combinations.

BIFOCAL LENS

Formerly and incorrectly referred to as Multifocal Lens surgery, **Bifocal Lens** cataract surgery utilizes a lens that has a series of rings in it which allows the lens to produce images for both distance and near vision. It has two focus points and is therefore a bifocal (not a multifocal) lens. It shows the brain two images at once and the brain chooses the one it wants to see and filters out the other image. This works quite well and both distance and near vision are good with this lens. The patient does need to make a choice here as they can see distance and reading distance or distance and computer distance but not both as this lens has only two focal points. At night, the pupil dilates when it is dark. When light from a point light source (such as a headlight or lamppost) passes through the rings in a dilated eye, it causes patients with these lenses to see halos around lights. Studies show these halos lessen over time but they are still always there. If you do a lot of night driving (drive for a living) or if you are a pilot, or if you think you do not want to trade seeing halos at night for the ability to see in the distance and at near, this lens is not the lens for you. Most of my patients don't mind the halos and tell me they gradually stop noticing them. They also say the halos do not affect their ability to drive at night and they were happy to accept the halos in trade for the ability to see in the distance and at near.

TRIFOCAL LENS (PanOptix Lens)

On August 27, 2019, the FDA approved the **PanOptix Lens**. This is the first trifocal lens available as a lens replacement option for patients undergoing cataract surgery. This lens truly is multifocal as it can help you see at distance, at around 16 inches for reading and at around 24 inches for the computer. There is quite a bit of data on this lens as surgeons have been using it in Europe for years. I am the most excited about this lens as it gives the patient the largest available range of vision from distance to near. There is still no lens available that can make you 18 years old and we still cannot guarantee "20/20" outcomes but this lens currently may be the best option at helping a patient achieve spectacle independence. It still has rings so patients with this lens will still see halos when looking at a point light source. Because the quality of distance vision is so high and because patients with the trifocal lens are able to be glasses free for a lot of their distance, computer vision, and near vision tasks, my PanOptix lens patients are among the happiest in my practice. Patients with astigmatism are not excluded from this lens as toric trifocal (PanOptix Toric) lenses are available. The company's study states 99% of people with the PanOptix lens would choose the same lens again and 98% of people with the PanOptix lens would recommend it to family and friends.

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EXTENDED DEPTH OF FOCUS LENS (EDOF Lens/ Symfony Lens)
An EDOF lens, such as the **Symfony Lens,** works differently than multifocal lenses. They give a higher quality distance vision than bifocal lenses. They have rings but these rings are diffractive steps that help the eye focus on distant objects and continue to focus through intermediate objects towards near ones. The vision gradually "comes in". Most of my patients with these lenses have excellent distance vision and note that their color vision is fantastic. They can also see to read their computers, ipads, and phones but may need to put on reading glasses to see very small print or if they are going to sit down and read for several hours. While some of my EDOF lens patients can read even the smallest print without glasses, this result should not be expected. The diffractive optic that helps you see closer objects creates a diffractive pattern that looks like a spider web or starburst and may be seen at night. In my experience, this phenomenon is also tolerated quite well by patients seeking to trade experiencing these starbursts/spiderwebs in exchange for decreasing their dependency on glasses. Patients with astigmatism are also not excluded from this lens as Toric EDOF (Symfony Toric) lenses are available.

ACCOMODATING LENS (Crystalens)
The **Crystalens** is an accommodating intraocular lens. This means that it changes its effective power when the ciliary body (a circular muscle within your eye) contracts. This allows it to become more powerful to better view near objects. Because the lens can move forward in the eye, it can give patients a broader range of vision than a monofocal lens. There are still some limitations. When the distance vision in the dominant eye is excellent, patients can often read at "computer" distance, but it can be hard to read very fine print. Making the nondominant eye a little blurry in the distance gives great computer vision and allows for better reading vision than the dominant eye (a sort of Crystalens monovision). With both eyes open, distant images, intermediate (computer) images, and close (reading) images can be seen. The ability to hit the refractive target with this lens is less predictable than with other lenses so a corneal refractive laser procedure such as PRK or LASIK may be required to "touch up" the vision. This laser "touch up" has an additional cost.

Please let me know about the following before signing up for surgery:

Are you on prostate medicines such as Flomax? _____
Do you have any severe medication allergies? _____
Have you had a bad reaction to anesthesia in the past?_____
Have you had prior refractive surgery such as Lasik, PRK etc.? _____

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<u>While all of the Non-Standard options discussed here with or without the use of ORA and/or the femtosecond laser all decrease dependency on glasses, they are NOT perfect.</u> No guarantees on "100% glasses free" can be made. Glasses (or contact lenses) may be required to perform certain tasks. For those who are not happy with the outcome of their surgery and are determined to become spectacle free, Laser Vision Correction may be required. (There are extra costs associated with this option). People who do the best with these "premium options" are easygoing people who are willing to tolerate possible glare, halos, spider webs or starbursts and the possibility of very good but not perfect vision to decrease their dependency on glasses. Patients who are poor candidates for these options are people who require the highest degree of visual clarity at any distance, people who have difficulty adjusting to changes in their glasses prescription, or people with unrealistic expectations who expect "perfect".

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I certify that I have read and understand my surgical options as described in the "So, You Have a Cataract…" handout. After discussing my options with Dr. Sando, Jr. and having all of my questions answered, I would like…

____ **Standard Cataract Surgery** – Distance Lens
____ **Standard Cataract Surgery** – Reading Lens
____ **Monovision Cataract Surgery** - ____________ eye is the near vision eye
____ **Toric Lens** to correct astigmatism– (Distance focused or Near focused)
____ **Bifocal Lens** (formerly and incorrectly known as Multifocal Lens Surgery)
____ **Crystalens** Surgery - _____________ eye is the dominant eye.
____**Extended Depth of Focus Lens (Symfony Lens)** Surgery (Regular or Toric version)
____ **Trifocal Lens (PanOptix Lens)** Surgery (Regular or Toric version)

____ Femtosecond Laser Assisted Cataract Surgery with or without Limbal Relaxing Incisions (LRIs) if needed (must also check one of the above 8 choices)

_____ ORA intraoperatively to confirm intraocular lens power (must also check one of the above choices)

____ date____________________
Patient Signature

____ date____________________
Ralph S. Sando, Jr., M.D.