

# BAUSCH + LOMB

# Crystalens<sup>®</sup>

## Accommodating Posterior Chamber Intraocular Lens

### PATIENT LABELING

### Introducing Crystalens<sup>®</sup>

Your physician has selected you as a good candidate for the Crystalens<sup>®</sup> accommodating intraocular lens. Congratulations.

Crystalens is completely unique. Unlike other mono- or multifocal IOLs, Crystalens is dynamic within the eye, moving continuously backward and forward to bring images from various distances into focus with reduced dependence on glasses.

You may soon be able to focus your vision at near, intermediate and distant images as Crystalens is designed to move effortlessly within your eye. For many, Crystalens may diminish the need for glasses altogether.

This booklet will guide you through the process of receiving a Crystalens from your doctor as treatment for your cataract. In addition, it will:

- Describe what a cataract is and your options to treat it
- Provide a good understanding of the Crystalens accommodating intraocular lens
- Explain the procedure
- Let you know what to expect from the Crystalens and how to get the best result
- Review the clinical results and the experiences of others
- Answer other questions you may have

Please consult with your doctor concerning any questions you have about the Crystalens or the surgery. You can also obtain additional information by calling the manufacturer, Bausch + Lomb, toll-free at 866-393-6642 (USA).

### What is a cataract?

Cataracts are a natural part of the aging process. More than 20 million Americans have cataracts.

A cataract is a progressive thickening, hardening and clouding of the eye’s lens. Because cataracts develop very slowly, the decline in vision can be difficult to detect. The first sign that your lens is hardening may be an increasing need for reading glasses. This is due to a loss of accommodation, the ability of the eye’s lens to move back and forward to focus on images that are near (14 inches or closer), intermediate (14 to 36 inches from the viewer) and distance.

**Near vision** is utilized for images such as reading, sewing or putting on makeup.

You use your distance vision when taking a walk or window-shopping.

**Intermediate vision** encompasses most daily activities, such as working on your computer or checking the instruments on your dashboard when driving.

Loss of accommodation, also known as presbyopia, affects nearly everyone after age 40. It actually begins gradually at about age 10 and continues to decline, becoming noticeable when we begin to experience difficulty focusing on close objects or fine print.

When this occurs, most people purchase reading glasses for occasional use. As the condition progresses, many people find they own several pairs and experience increased frustration at their growing dependence on them for daily life.

When one is old enough to develop cataracts, they may affect your ability to enjoy the things you used to do. In addition, you may experience changes in how you see colors, have problems with glare from lamps or the sun, begin to encounter double vision or see a frequent need for a new, stronger spectacles prescription.

Eventually, your physician will recommend cataract surgery, the most common and one of the safest procedures performed in the U.S. Removal of the opacified lens and replacement with an artificial lens (an intraocular lens implant or, rarely, aphakic glasses) is the primary treatment for cataracts.

### How the eye works

### CORNEA

The transparent front segment of the eye that covers the iris and the pupil, providing most of the eye’s optical power.

### IRIS

Pigmented tissue that lies behind the cornea that gives color to the eye (e.g., brown eyes) and controls the amount of light entering the eye by varying the size of the black pupillary opening. The iris opens wide for distance vision and constricts for near vision.

### CRYSTALLINE LENS

The natural crystalline lens is the primary focusing mechanism of the eye. Made up of protein and water, located behind the iris, it changes shape and moves forward and back to focus images from various distances onto the retina.

#### CAPSULAR BAG

The clear, thin, elastic membrane that holds the lens. When a cataract is removed, the replacement IOL is implanted into the capsular bag.

#### ZONULES

Thin fibers that ensure the stability of the lens, attaching it to the ciliary muscle.

#### CILIARY MUSCLE

Controls the accommodation of the lens. When the muscle relaxes, the lens rests in the back position for distance vision. When the muscle contracts, it pushes down on the vitreous, which gently pushes the lens forward for near vision. As the lens enlarges and hardens, the ciliary muscle is unable to work as well.

#### VITREOUS HUMOR

A transparent jelly and fluid that fills the section of the eye between the retina and the lens. When the ciliary muscle contracts, the vitreous gently pushes the lens forward.

#### RETINA

Sensitive tissue at the rear of the eye that contains the light sensitive rods and cones that capture the visual images and sends them along the optic nerve to the brain.

#### OPTIC NERVE

Carries the visual information captured on the retina to the visual cortex of the brain for recognition and interpretation.

### Vision Restoration Options

Until now, all options for treating early loss of accommodation were fixed focus (stationary) solutions such as glasses, contact lenses or bifocals.

After the cataract matured, the natural cataractous lens is surgically replaced with an artificial lens implant called an intraocular lens or IOL. While IOLs are a proven option for the treatment of cataracts, they too are stationary within the eye.

#### Intraocular Lens Implants (IOLs)

Until now, there have been two types of IOLs, monofocal and multifocal.

#### Monofocal IOLS

The vast majority of available IOLs are monofocal. It is a technology that has been used successfully for decades. Monofocal IOLs provide clear vision at one focal point, usually distance vision. In most cases, however, the patient still needs to wear glasses or contact lenses to see images within their near field of vision and sometimes for those in the intermediate field of vision, as well.

#### Multifocal IOLs

Multifocal IOLs are a relatively new technology. Different fixed visual zones are built into the optic of the lens. Multifocal IOLs can be a good option for the right patient, although patients with multifocal IOLs have often reported problems with glare and halos.

#### Corneal Ablation (LASIK, LASEK and PRK)

LASIK and other corneal procedures re-shape the cornea to correct

nearsightedness, farsightedness or astigmatism. None of those procedures address accommodation or cataracts in any way. Most doctors feel these types of procedures are a good option for younger patients who have not begun to experience loss of accommodation.

#### Without accommodation, all other options fall short

Patients cannot adjust their vision from distance to intermediate and near.

#### The challenge of stationary vision

Accommodation is the ability of the natural crystalline lens to adjust, and with the natural contractions of the muscle in the eye, to focus on objects through a range of near, intermediate, and far distances.

As with the natural lens, an accommodating lens moves and flexes, in response to ciliary muscle contractions in the eye. These contractions drive forward movements of the lens so the eye can maintain a clear image as it focuses on near, intermediate and far objects. Crystalens<sup>®</sup> is the first and only accommodating lens approved by the FDA.

#### Introducing Crystalens accommodating IOL

#### Addressing cataracts through the power of accommodation.

The Crystalens accommodating intraocular lens

- Plate Haptics and loops hold the lens in place
- Hinges allow lens to move gently forward and back
- Optic focuses the image on the retina

Crystalens is the first and only accommodating IOL in the United States.

Crystalens is designed to mimic the natural accommodating process of the eye. The exact mechanism of the lens has not been fully elucidated but it is designed to move backward and forward inside the eye using a hinge, which is located next to the optic of the lens. The effect on the hinge for movement of greater than a million cycles has not been established. This dynamic enables the eye to automatically focus the lens on images that are within distant, intermediate and near fields of vision and eliminates or reduces your need for glasses or contact lenses after surgery. Remember, while there is every reason to believe you will receive excellent results from your Crystalens, everyone’s focusing capabilities are different. Your optimal vision solution may allow you to do most things without glasses while others may be more comfortable with spectacles for a certain task.

**Based on bench testing, the lens models with aspheric surfaces may provide somewhat reduced near acuity compared to the spherical model. No clinical study was performed to verify these findings.**

**Clinical studies have not been conducted with the Crystalens AO models to assess the effect of the added aspheric surface on spherical aberration, night-time distance visual acuity, and contrast sensitivity compared to the parent model Crystalens Model AT-45.**

#### Excellent visual results

The Crystalens clinical study for the United States Food and Drug Administration involved 497 eyes in 324 adult patients over 50 years of age. Results of the study demonstrated Crystalens power to restore patients’ vision and reconnect them with the most important aspects of their lives.

- 100% of patients implanted with Crystalens in both eyes could pass a driver’s test without their glasses
- 100% could see intermediate (24” to 30”), the distance for most of life’s daily activities, e.g., dashboard, prices in the supermarket, and their computer screen, without their glasses
- 98.4% could see well enough to read print the size of the stock quotes in the newspaper or read the phone numbers in the white pages of a telephone book without their glasses
- More than 80% reported they were using their computer, shopping and applying make-up without needing their glasses
- Some patients did require glasses for some tasks after implantation of the Crystalens
- Significantly more patients implanted with a Crystalens (88.4%) could see better at all distances than patients implanted with a standard IOL (35.9%).
- Based on bench testing, the lens models with aspheric surfaces may provide somewhat reduced near acuity compared to the**

**spherical model. No clinical study was performed to verify these findings.**

### Clinical study results

#### Benefits:

The Crystalens clinical study involved nearly 500 eyes in more than 300 patients. The results indicated that almost all of the patients implanted in both eyes with the Crystalens had good distance vision after surgery (i.e., they could see 20/32 or better at distance), all patients had good intermediate vision, which means that they could see a computer screen or items at arms length, and the majority (98.4%) could read the newspaper without glasses. Almost all of the study patients had vision good enough to allow them to pass their drivers test, see their computer, shop, apply their makeup, or read a newspaper without glasses or contact lenses. Of those patients who had only one eye implanted, about 1 in 10 had their near and/ or far vision worse than 20/40 after the surgery. Two in a hundred had their intermediate vision become worse than 20/40 after the surgery. In contrast, of those patients implanted with a standard IOL, about 6 in 10 had their near and/or far vision worse than 20/40 after the surgery. Six in a hundred had their intermediate vision become worse than 20/40 after the surgery. In the clinical study, more than 85% of patients were able to drive with mild to no difficulty at night. In addition, nearly 85% of patients did not wear spectacles to see at night.

**Based on bench testing, the lens models with aspheric surfaces may provide somewhat reduced near acuity compared to the spherical model. No clinical study was performed to verify these findings.**

#### Risks:

The complications and side effects experienced during the clinical study were similar to those experienced with other intraocular lenses and with routine cataract surgery. Because it is surgery it is not completely risk-free. Complications may occur as a result of the removal of your cataract whether or not an intraocular lens is implanted.

Complications of cataract surgery range from minor, usually temporary side effects, to sight-threatening complications. Fortunately, significant sight-threatening complications are extremely rare and include, but are not limited to infection, hemorrhage, and retinal detachment. People with existing medical conditions such as diabetes and chronic eye infections are at a higher risk of developing complications.

The risks of implantation with the Crystalens are the same risks that exist for all cataract surgery with IOL implantation. However, because the Crystalens contains hinges, there is an additional risk of the lens becoming stuck in an undesired position (vaulting). Vaulting is typically associated with blurry vision. This blurriness may occur suddenly or gradually. If your vision becomes blurred, contact your eye doctor immediately. Vaulting is most commonly treated via a secondary surgery, which has additional risks. Sometimes vaulting requires IOL removal and replacement.

The effectiveness of ultraviolet light absorbing lenses in reducing the incidence of retinal disorders has not been established. Unlike your crystalline lens and most IOLs that are currently available in the United States, the Crystalens does not absorb a significant amount of ultraviolet light. Therefore, you should wear sunglasses with UV 400 protection when in sunlight.

The long term safety and effectiveness of this lens have not been proven.

#### Are you a candidate for the Crystalens?

Your doctor will perform a thorough examination to determine if you have a cataract, and advise you of the most appropriate option for correcting your vision. Depending upon your expectations, lifestyle and the presence of any pre-existing visual conditions, your ophthalmologist will determine whether you can benefit from the implantation of a Crystalens IOL. Virtually everyone with good general health is a candidate for implant surgery. Individuals with chronic eye infections, uncontrolled diabetes, or other health problems may have to wait until these conditions are managed before they have surgery.

People who have had prior corneal refractive surgery (for example, LASIK) are acceptable candidates for Crystalens implantation as long as their eye

is in good health. If you have already had cataract surgery, you are not a candidate for Crystalens implantation.

### Warnings and Precautions

#### Warnings

1. Your eye doctor may not be able to implant the Crystalens into your eye if complications occur during surgery, prior to IOL implantation (e.g. tissue damage that may interfere with proper positioning or function of the IOL). Depending on your specific surgical complications your eye doctor may or may not be able to implant a different IOL during the same surgical procedure.

2. Contact your eye doctor immediately if you have any of the following symptoms while using the antibiotic eye drops prescribed by your eye doctor: itching, redness, watering of your eye, sensitivity to light. These symptoms could indicate a potential serious eye infection.

#### Precautions

1. As with any surgical procedure, there is risk involved. Possible complications from cataract surgery include infection, damage to the lining of the cornea, separation of the retina from the layer of tissue at the back of the eye (retinal detachment), inflammation or swelling inside or outside the eye, damage to the iris (the colored part of your eye), and an increase in eye pressure. You may need additional surgery to treat other surgery complications.

2. Tell your eye doctor if you have been diagnosed with any eye disease. The safety and effectiveness of the Crystalens has not been established in patients with preexisting eye conditions and complications during surgery, such as an increase in eye pressure (glaucoma) or complications of diabetes in the eye (diabetic retinopathy). The outcome of cataract surgery will depend on the health of your eye before surgery.

3. Tell your eye doctor if you have had prior refractive surgery, such as LASIK. The safety and effectiveness of the Crystalens has not been studied in patients with prior refractive surgery.

4. You will need to wear glasses if you have any of the following:
a. Nearsightedness or farsightedness after surgery: These conditions may result from errors in measurements before surgery, wrong lens power, or changes in the cornea in response to the surgery.
b. Uncorrected astigmatism after surgery: This condition may result from the same reasons as stated above.
c. If you must do prolonged reading or read small print, you are likely to need to wear reading glasses.

5. Avoid any activity that could harm your eye while you are recovering from surgery. For example, avoid any activities where objects can come in contact with or put pressure on the eye, such as Tennis or Scuba Diving.

6. Unlike most other IOLs, the Crystalens contains hinges. There are adverse events in which the lens moves into a displaced position when the hinges get stuck. These events are referred to as cases of “lens vault” or “vaulting” and typically cause blurry vision. These may come on suddenly or gradually. If you have only one good eye, and vaulting occurs suddenly, it can make driving or other similar situations hazardous. If this occurs, you should exercise caution. In any case, if you experience blurred vision you should contact your eye doctor promptly to determine the cause. When vaulting occurs, a second surgery is often required to restore the lens to its correct position; sometimes it is necessary to remove the lens.

### What to Expect Before Surgery

Once selected as a candidate for the Crystalens, be certain that you are comfortable with all aspects of your cataract surgery. Ask questions and inform your surgeon of any medications you are currently taking. Prior to surgery, you can expect:

- Pre-op visit- physician evaluations of your eye and vision needs
*This is your chance to ask questions of your doctor and share any specific visual needs you might have. For example, if you have a hobby or pastime, such as oil painting, golfing, playing the piano or gardening.*

- Precise pre-op measurements
*Prior to surgery, your doctor will perform three tests that will measure your vision and help to ensure the results achieved by your Crystalens are consistent with your expectations.*
- Refraction-measures what you see compared to a standard scale, i.e. 20/20*
- Biometry-measures the length of the eye and tells the doctor the power of the lens to be placed in the eye*
- Keratometry-measures the amount your cornea is curved, bending light toward your lens*

**During Surgery**

While Crystalens is a unique technology, your doctor has performed hundreds of surgeries with very similar requirements and undergone additional training for achieving the best outcomes with Crystalens. The expertise of your doctor is well matched to the innovations offered by the Crystalens. That is why he or she was selected to offer the Crystalens to patients.

A few things to know for your day of surgery:

- Surgery with the Crystalens is an outpatient procedure
*Surgery is usually performed as an outpatient procedure and typically takes less than 20 minutes. However, you will need a friend or family member to take you home.*
- Your surgeon will use eye drops to anesthetize your eye and dilate your pupil
- Your nurse will cleanse and drape your eye
- You will be awake during the short procedure
- You will experience no pain, but there will be a slight pressure

### Getting the best result

**After Surgery**

It is important that you closely follow your doctor’s instructions after surgery with the Crystalens. Do not rub your eye since this could impair its healing. During the first day post-op it will be important to limit your activity. After that you should be able to perform all of your normal activities, including showering and swimming. In addition, during the first two weeks it is important to remember:

- Use glasses to read while your new lens settles within your eye
- Your pupils will be dilated, so you will not be able to focus near and you may experience glare
- Your intermediate vision will be slightly diminished, but will improve
- Your distance vision will not significantly diminish and will improve
- You may experience halos around bright lights because of the eye drops your doctor has given you. These side effects will quickly dissipate

**AFTER TWO WEEKS, READ WITHOUT YOUR GLASSES AT LEAST TWICE A DAY FOR 10 MINUTES A SESSION.**

Read the smallest type you are comfortable with. A Vision Restoration Card may be provided as a tool in re-training your eye muscles.

Among the most important things post-operatively will be for you to work the ciliary muscle back into shape. This is the muscle in your eye that enables your natural lens to move to focus on images at different distances. As part of the normal aging process, it has not had to work as it did when you were younger since you have seen at near through a bifocal or reading glasses. That is because your own lens has enlarged and hardened and become less flexible. Therefore, the muscle surrounding that lens is out of shape and must be exercised back into shape.

To achieve that end:

- Don’t wear any reading glasses after the first two weeks
  - Use the Vision Restoration Chart daily
  - READ, READ, READ without glasses
  - Keep practicing until you can read comfortably without glasses (may be approx. 2 months but will probably improve over the first 12 months)
  - You should wear sunglasses with UV 400 protection when in sunlight
- And, remember:
- Your near vision may continue to improve for up to 12 months,**

**especially if you use it!!**

### Frequently Asked Questions

**What is Crystalens?**

Crystalens is a new technology that is designed to mimic the eye’s natural ability to focus on distant, intermediate and near objects. Used in conjunction with standard cataract extraction methods, the Crystalens can restore a continuous range of vision without total dependence on glasses or contact lenses.

**What makes the Crystalens different from other intraocular lenses?**

The Crystalens has the unique ability to focus on objects at varying distances using the eye’s natural muscle. This means that the Crystalens can provide improved vision, without corrective lenses, throughout a range of distances from near to far. Standard (single vision) lens implants have a single focus point and do not have the ability to provide a full range of vision. Most people who have single vision lens implants MUST wear glasses for intermediate and near vision.

**Can my vision be corrected to 20/20, for both reading & distance?**

In the clinical studies with 324 patients over the age of 50, 100% could see images at intermediate distances (24”-36”), 98.4% could read print the size of the stock quotes in the newspaper or phone numbers in the telephone book and 98.4% could see distant objects all without glasses. 100% could see well enough without their glasses to pass their driver’s test. It was also shown in the clinical studies that significantly more patients implanted with a Crystalens (88.4%) could see better at all distances than patients implanted with a standard IOL (35.9%).

Visual acuity is subjective and depends upon each individual’s own ocular and physiological conditions as well as lifestyle preferences. Some patients implanted with the Crystalens still require glasses for certain activities.

**Based on bench testing, the lens models with aspheric surfaces may provide somewhat reduced near acuity compared to the spherical model. No clinical study was performed to verify these findings.**

**What about my intermediate vision, like working on the computer. Will it be like wearing trifocals?**

Your ability to see at approximately arm’s length (intermediate vision) will be greatly enhanced with the Crystalens. Over 98% of people enrolled in the clinical study were able to see 20/20 at arm’s length without correction. And, 100% could see 20/32. In addition, the quality of vision compared to wearing trifocals is significantly improved. You can have a continuous range of vision, without having to tilt your head to find that portion of your glasses that allows you to see clearly. The Crystalens is designed to mimic the natural focusing ability of your eye.

**Will I be able to read in all light conditions?**

The Crystalens functions very much like the normal human lens. It is important to remember that reading vision in low light is also influenced by the overall health of your eye and by the condition of the light sensors in the retina. As we get older our ability to see in low light conditions may start to decrease. It is always best to read in good light conditions.

**How do I know if I am a good candidate for Crystalens implantation?**

If your vision is becoming less clear, you suspect you have a cataract or if you are frustrated with an increasing dependence upon glasses, you should consult with your ophthalmologist. Your doctor will perform a thorough examination and advise you of a customized treatment plan for effectively correcting your vision.

Virtually everyone with good general health is a candidate for implant surgery, but people with chronic eye infections, uncontrolled diabetes, or other health problems may have to wait until these conditions are under control prior to surgery.

People who have had prior corneal refractive surgery are acceptable candidates for Crystalens implantation as long as their eye is in good health. Talk to your doctor.

If you have already had cataract surgery, you are not a candidate for Crystalens implantation.

**How long will the surgery take? Will I feel anything?**

Crystalens implant surgery is typically performed in an outpatient surgical facility. You will arrive at the surgery center about an hour before the procedure. A number of drops will be placed in your eye and oral medications may be administered to help you relax. The eye drops anesthetize your eye and dilate your pupil.

The actual surgery usually takes less than 15 to 20 minutes. The surgeon will stabilize your eye with a device to keep your eyelids open. You will feel no pain, only slight pressure on your eye.

**What can I expect after surgery?**

Once the surgery is complete, additional drops will be placed in your eye to prevent infection, decrease inflammation, and keep your pupil dilated. A patch may be placed over your eye and someone will need to drive you home. Once at home, you should rest for the remainder of the day. You should avoid any strenuous activities. Your doctor will see you the day after surgery to remove the eye patch, if used, and examine your eye. Do not rub your eye since this could impair healing.

The doctor will give you additional medications that you will need to put in your eye for the next two weeks. These drugs help the eye heal and will wear off in a week to 10 days leaving no residual effects.

**What are the chances that something could go wrong with the surgery? What would they be?**

Cataract surgery is one of the most common eye procedures currently performed and is considered to be extremely safe and effective. The risk of sight-threatening complication is extremely rare, but because it is surgery it is not completely risk-free.

Complications of cataract surgery range from minor, usually temporary side effects, to sight-threatening complications. Fortunately, significant sight-threatening complications are very rare and include, but are not limited to infection, hemorrhage, and retinal detachment. People with existing medical conditions such as diabetes and chronic eye infections are at a higher risk of developing complications.

Your doctor will perform a thorough examination and fully inform you of any increased risk of a complication.

**What will my vision be like after surgery?**

Your distance vision will usually be very good within a day or two after surgery. However, your middle and near vision may be somewhat blurred at first.

Drops may be applied to your eye after surgery, which paralyze the eye’s ability to change the focus from far to near. These drops dilate your pupil and may make you sensitive to light until the drops wear off. This is done to ensure that the Crystalens is correctly positioned in your eye as it heals. It will take 7 to 14 days for the effects of this drug to wear off. You may need to wear reading glasses to help you read during this time.

After about 2 weeks, you may notice that your intermediate (arm’s length) vision is improving and your near vision is also starting to get better. It is important to strengthen the focusing muscle of your eyes.

It may take several months for your eyes to reach their full focusing potential. The more you try to read without reading glasses, the quicker you will be able read without them. You may notice a difference in your vision from one eye to the other after your eyes heal. This is normal. If the difference in your vision is significant your doctor may recommend additional surgery, although this is rare. This is often done for the correction of astigmatism after implant surgery.

Everyone’s focusing ability is different. Most people will able to see clearly in the distance, have excellent intermediate vision and will be able to read a newspaper without glasses, but some people may be more comfortable with additional correction, particularly at night or in dim light.

It is important to remember that implant surgery cannot resolve pre-existing visual conditions such as floaters, flashes, macular degeneration, or visual field loss that are a result of conditions of the eye and are not related to the human lens.

**What about glare, problems driving at night and sensitivity to light? Can implant surgery create these problems?**

These symptoms can be produced or exacerbated by cataract surgery. A unique feature of the Crystalens is the smaller optic (5.0 mm diameter)

compared to a standard IOL which is typically 6.0 mm in diameter. Many people report these problems before cataract surgery and even after surgery; however, they are rarely debilitating. While clinical studies showed that the amount of glare experienced by patients implanted with the Crystalens was comparable to a standard IOL and is minimal to absent, small optics may cause glare or other visual disturbances under certain lighting conditions.

Glare can be a problem at night when the pupil widely dilates. This typically does not occur in your central field of vision, but rather in the periphery.

**Will I have to have cataract surgery again?**

Once your cataracts are removed and replaced with an artificial lens, you will never have to have cataract surgery again. Occasionally, several months after the lens has been placed in the eye, the vision may start to become cloudy once again. This is sometimes called a secondary cataract and refers to the clouding of the membrane that surrounds the implant.

A laser is used to make an opening in the membrane behind the implant, immediately improving vision. This is usually done in the office and takes only a few minutes and does not require an anesthetic. Once this is done no further surgery related to your cataracts will be required. This procedure is known as a YAG capsulotomy.

**How do I know who is a qualified Crystalens implant surgeon?**

All surgeons who are implanting the Crystalens have gone through a comprehensive training course. Your surgeon has been performing cataract implant surgery for years and applies many of the same techniques to implanting the Crystalens.

### Glossary of Terms

**Accommodation** - The movement of the lens to focus on images at various distances.

**Anesthesia For Cataract Surgery** - The standard cataract surgery anesthetic is now topical drops. The patient is awake during surgery, but may be sedated.

**Aphakia** - The absence of the eye’s natural crystalline lens, usually after cataract removal.

**Aphakic Spectacles** - Thick, plus-powered eyeglasses that were once the standard correction following extraction of a cataract. The glasses were cumbersome and greatly distorted peripheral vision. Today, an intraocular lens (IOL) is implanted in the eye after the cataractous lens is removed.

**Astigmatism** - Astigmatism is blurry vision produced by football-shaped corneas, which are too steep in one place and too flat in another. Astigmatic corneas focus light in two different places in the eye, making both near and distance vision a problem.

**Capsular Bag** - The clear, thin, elastic membrane that holds the lens.

**Cataract** - An opacity or clouding and hardening of the crystalline lens that may prevent a clear image from forming on the retina and reduces the lens’ ability to accommodate. The cataractous lens may require surgical removal and replacement with an intraocular lens if visual loss becomes significant.

**Ciliary Muscle** - Control the accommodation of the lens. When the muscle relaxes, the lens rests in the backwards position for distance vision. When it contracts, it increases the pressure in the vitreous which gently pushes the lens forward for near vision. As the lens enlarges and hardens, the ciliary muscle is unable to work as well.

**Cornea** - The transparent front segment of the eye that covers the iris and pupil, providing most of the eye’s optical power.

**Crystalline Lens** - The natural lens of the eye, located behind the pupil, which helps bring rays of light to focus on the retina. Made primarily of protein and water, the original state of the lens is transparent and flexible, but the lens becomes cloudy, enlarges and hardens with age.

**Diopter** - A measurement of the degree to which light converges or diverges; which relates to the refractive power or strength of the lens.

**Haptics** - The two plates and/or tiny loops located on opposite sides of an intraocular lens that hold the lens securely in place. Crystalens has patented hinges built into the haptics to allow gentle movement forward and backward to focus.

**Hyperopia** - Also known as farsightedness, hyperopia is a refractive error caused by the eye being too short. Light focuses behind the retina and

therefore strikes the retina before it can come to a sharp focus.

**Intermediate Vision** - Range of visual focus between 14” - 36”, e.g., seeing the dashboard, prices in the supermarket, computer screen

**Intraocular Lens (IOL)** - A clear, artificial lens that may be surgically implanted to replace the natural cataractous lens of the eye. The Crystalens is a flexible IOL made of a proprietary advanced generation solid silicone called BioSil™.

**Iris** – The pigmented tissue that lies behind the cornea that gives color to the eye (e.g., brown eyes). It controls the amount of light entering the eye by varying the size of the black pupillary opening. The muscles in your iris open the pupil wide for distance vision and make it small for near vision.

**Laser Assisted In-Situ Keratomileusis (Lasik)** - Is considered effective for myopia (nearsightedness). The surgeon uses an excimer laser to ablate a thin layer of the cornea. LASIK will not treat a cataract or improve the lens’ ability to accommodate.

**Myopia** - Also known as nearsightedness, myopia is a refractive error caused by the eye being too long. In these cases light focuses instead in front of the retina.

**Near Vision** - Range of visual focus up to 14”, e.g., reading, sewing, etc.
**Ophthalmologist** - A physician and surgeon specializing in refractive, medical, and surgical treatment of eye diseases and disorders.

**Optometrist** – A primary eye care provider who diagnoses and treats disorders of the visual system, and manages and treats eye diseases.

**Phacoemulsification (fay-koh-ee-mul-sih-fih-KAY-shun)** - A cataract surgical procedure which uses an ultrasonic vibration to break up and remove a cataract through a tiny incision.

**Point Size** - A relative measure of the size of a font in type. 20/40 vision is equivalent to reading 6-point type, the size of the stock quotes in the newspaper or print in the telephone book. Most computers are set to 12-point type.

**Presbyopia** - Occurs as the lens of the eye ages, enlarges and becomes less elastic and less able to accommodate. Usually becomes significant after age 45 and is often signaled by the need for reading glasses or bifocals.

**Pupil** - The variable-sized, black circular opening in the center of the iris that controls the amount of light that enters the eye.

**Retina** - The thin lining at the back of the eye that converts images from the eye’s optical system into electronic impulses sent along the optic nerve for transmission to the brain.

**Vaulting** – An uncommon complication that can develop following implantation of the Crystalens. Vaulting occurs when the lens hinges become stuck in an undesired position. Vaulting typically causes blurry vision.

**Vitreous Humor** - A transparent jelly and fluid that fills the section of the eye between the retina and the lens. When the ciliary muscle contracts, it increases the pressure in the vitreous which then gently pushes the lens forward.

**YAG Laser** - The YAG laser is a surgical instrument that emits a short pulsed, high energy light beam that can be precisely focused to treat a clouding of the remaining capsular tissue that envelopes the IOL. The surgery is performed on an outpatient basis, is done without an anesthetic usually in the office, takes only a few minutes and is painless.

**Zonules** - Thin fibers that attach the lens to the ciliary muscle.

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