The Light Adjustable Lens – What you should expect

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The Light Adjustable Lens (LAL) is the first intraocular lens (IOL) whose power can be adjusted after cataract surgery. It is designed to improve how well you see without eyeglasses compared to a standard single focus lens implant.

What is the advantage of the light adjustable lens over other IOLs?

Every other IOL comes in a fixed range of powers, and preoperative calculations are performed to assist the surgeon in estimating the correct lens power for your eye. The measurements are plugged into various IOL formulas, which estimate the IOL that is most likely to hit the target that you set with your cataract surgeon. As you might expect, these formulas are not 100% accurate for every patient because of individual differences in eye anatomy and healing.

Certain factors may make IOL power selection much less accurate, such as a **history of prior refractive surgery like LASIK, PRK, or RK (radial keratotomy)**. Others are born with an unusually flat or steep cornea or an extra short or long eye length. For patients in this situation, having an adjustable IOL may be especially beneficial. Those who enjoy **monovision**—using one eye for distance and the other for near—will enjoy the precision of the LAL because of its ability to fine tune each eye for its optimal target.

How does the light adjustable lens work?

The LAL contains molecules that are light-sensitive. Their position can be adjusted by an external UV light beam, which alters the shape of the IOL without requiring additional surgery. As the shape of the IOL changes, its power changes, which can adjust for astigmatism, nearsightedness, or farsightedness.

Immediately after the LAL is implanted in your eye at the time of cataract surgery, you will wear special UV-blocking glasses to cover your eyes. **You need to wear these glasses 100% of the time while you are awake except when you take a shower.** We provide these glasses for you as part of the LAL surgery—one pair that is clear, one sunglasses, and one clear with a bifocal for reading. These temporary glasses protect the IOL from receiving UV light until the adjustment process is complete.

Most patients will require four adjustments, although some may require one fewer or one more. The adjustments are performed in our office, where we use a light delivery device to send the beam that reshapes the IOL for approximately two minutes per adjustment. The first customized treatment is typically performed 2 to 3 weeks after the cataract surgery. Additional adjustments are performed several days apart. When the result is satisfactory, a final "lock-in" treatment is performed, after which the IOL can no longer change or be adjusted. Some patients, such as those with a history of RK, may need more time to stabilize first. It is important to wear your UV-blocking glasses until the final lock-in is performed, after which they are never needed again. After lock-in, there are no extra precautions ever needed for sunlight or UV light. Because the LAL is adjustable postoperatively, many patients elect to have both eyes operated on at the same time with this option.

What is astigmatism?

Like nearsightedness or farsightedness, **astigmatism** describes a common type of natural blur in healthy eyes that is corrected by wearing eyeglasses. It results from an inherited, imperfect optical shape of the cornea, the clear front window of the eye. The ideal shape of your cornea is perfectly round, but if it is

oblong (like the back of a spoon) instead of spherical, then it will mis-focus details. The more astigmatism one has, the more optically blurry the vision is without eyeglasses. There is no advantage to astigmatism because it adds blur to every focal distance. Corrective eyeglasses and contact lenses can compensate for this corneal shape to correct this blur and to focus eyes with astigmatism properly.

Astigmatism can be reduced or nearly eliminated at the same time that cataract surgery is done. Traditionally, this is done with a special artificial lens that is selected for your cataract surgery called a **toric** lens implant. Unlike the LAL, toric IOLs come in a set range of powers. The LAL has the advantage of being able to provide customized astigmatism correction after your eye has healed and the IOL has settled into its final position. For this reason, it will provide the most accurate final outcome. Although it can increase slightly in some eyes with age, astigmatism won't go away on its own; therefore, the benefit of the LAL should be life-long.

Will I still need eyeglasses with the light adjustable lens?

Most patients will still need glasses in some situations with the LAL, usually for reading small print. However, the LAL improves the "depth of focus," meaning that it gives more range of vision than the basic single focus lens. If you choose to set both eyes for distance vision, you will need glasses for reading and other near activities. However, many patients will obtain good range of vision with the LAL if they choose to make one of their eyes slightly nearsighted. If a patient found that they couldn't adapt to this slight difference, it can be reversed with a second LAL adjustment. Although the LAL does not give as much near range as a multifocal lens, the LAL does not have rings, so it does not cause additional glare, starbursts, or halos at nighttime.

Unlike all of the other IOLs currently available, the LAL allows us to use trial and error to preview various lens powers in front of your eye, like we do when we fit patients for eyeglasses. Some patients, such as those with prior LASIK, PRK, or RK, have irregular corneas, meaning that the shape of the window in the front of their eye is asymmetric. If your cornea is irregular to the point that you need a rigid gas permeable ("hard") contact lens, the LAL will not be able to correct for all of your aberrations in cornea shape.

Also, no IOL can compensate for having other issues with your eye health, such as glaucoma, macular degeneration, or diabetic retinopathy. Because the LAL does not have rings and does not split light, however, it still can be an appropriate choice for those with co-existing eye problems because it has outstanding optical quality.

What are the risks or disadvantages to the light adjustable lens?

Cataract surgery with the LAL poses no additional medical risk and is perfectly safe. The surgery is performed in the usual manner through a small incision. However, some patients are not eligible to receive this IOL, such as if their pupils do not dilate widely enough. Your surgeon will screen you for those conditions at the time of your consultation. You should also be sure that you can comply with full time UV glasses wear (for 4-5 weeks postoperatively) before you commit to receiving the LAL.

Of all of the special artificial lens implants, the LAL is the most expensive upgrade because it is basically a lens that becomes customized for your individual eye. Health insurance, including Medicare and PPOs, covers the costs of cataract surgery with a basic single focus lens implant. However, the additional charge for implanting and adjusting the LAL is not covered and must be paid out-of-pocket by the patient. Remember that the benefit of the LAL is to improve your natural eyesight without eyeglasses. The lenses are not "medically necessary" because they have nothing to do with improving your eye health.