



Phoenix Ophthalmologists, P.A.

SMALL INCISION CATARACT SURGERY

An Educational Pamphlet

by

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and

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About Your Surgeon

Gary Mackman, M.D.

Dr. Gary Mackman, a board-certified, fellowship trained corneal, refractive and cataract surgeon, has performed various cataract, refractive and corneal surgical procedures since 1981. Dr. Mackman has given lectures, presented



exhibits, and has taught courses at major ophthalmology conventions. Dr. Mackman has also published numerous articles in many of the major journals on eye disease and eye surgery. Dr. Mackman received his B.S. in 1972 and his M.D. degree in 1976 from the University of Wisconsin in Madison. Dr. Mackman then completed an Ophthalmology residency from 1977-1980 at the University of Wisconsin and a Fellowship in Corneal Disease and Surgery at the University of Florida,

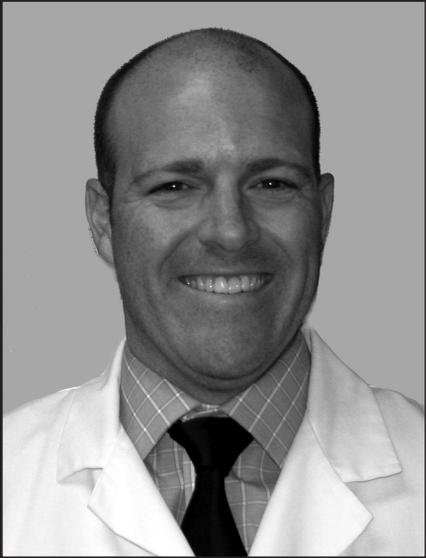
Gainesville, from 1980-1981. Dr. Mackman, practices Ophthalmology in Phoenix, Arizona, specializing in small incision cataract and intraocular lens implant surgery, laser and non-laser refractive surgery, medical and surgical disease of the cornea, and general medical/surgical eye care. Dr. Mackman is a fellow of the American Academy of Ophthalmology, member of the American Society of Cataract and Refractive Surgery, a member of the Castroviejo Corneal Society, and former president of the Phoenix Ophthalmological Society.

Jeremy VanBuren, M.D., Ph.D.

Dr. Jeremy VanBuren, originally from Peoria, IL, joined Phoenix Ophthalmologists in summer 2009. He specializes in both medical and surgical ophthalmology, including glaucoma evaluation, diabetic retinopathy screening, and small incision cataract surgery.

Dr. VanBuren received his B.S. in physiology from the University of Illinois and his M.S. in neurobiology from Northwestern University. He went on to get a Ph.D. in Neuroscience and Pharmacology from Southern Illinois University. Dr. VanBuren next completed his M.D. in 2005 from the University of Wisconsin. Following medical school and internship, he remained at UW and completed residency training in ophthalmology from 2006 to

2009. Over the course of his training, he has published numerous scientific papers and authored several textbook chapters. He is a member of the American Academy of Ophthalmology, the American Society of Cataract and Refractive Surgery and the Phoenix Ophthalmology Society.



SMALL INCISION CATARACT SURGERY

What is a Cataract?

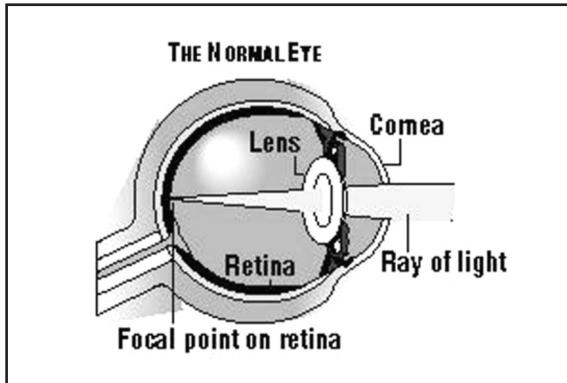


Fig. 1: The Normal Eye

Inside the front of the eye is a lens, much like the lens of a camera. Its function is to focus light rays onto the retina (the film in the camera) at the back of the eye, which then transmits pictures of what you see to the brain. This lens must remain clear for the light to properly pass through and reach the retina. When all or part of the lens becomes cloudy, like a whitewashed window, the vision becomes blurred. This clouding is referred to as a cataract. A cataract is part of the lens. It is not a film or growth over the eye.

Causes of Cataracts

There are several types of cataracts. Some can be present from birth (congenital) and others can form due to an injury to the head or eye (traumatic). Some are disease related (diabetes). Most cataracts are the result of the normal aging process of the eye. Over 95% of today's population over 60 years of age have some degree of cataract development.

Symptoms of a Cataract

Dimming and blurring of vision are the main symptoms of cataracts. Colors may seem faded or altered and reading may become difficult or even impossible. With some types of cataracts, sunlight, car headlights, or halos around lights at night may be very irritating and interfere with vision. Many patients feel as though a film is covering their eye, however, this is really the cataract (clouded lens) which is obstructing vision from inside the eye and is not a film on its surface (Fig. 1).

Treatment for a Cataract

Surgery is the only effective treatment for cataracts when glasses are no longer an option. There are no medicines, diets, or drops that will make a cataract go away. There is no laser surgery available at the present time to remove a cataract.

Decision to have a Cataract Removed.

In the great majority of cases, you are the one who will decide when to have cataract surgery. In the past, surgeons usually waited until a cataract reached the mature or “ripe” stage to remove it. **However, modern surgical advances have made it safe and possible to perform cataract surgery at any stage of development.** Therefore, if you are not able to drive a car and your lifestyle requires it; if you have difficulty reading and you do a lot of it; if you cannot do your own shopping; if you are losing a lot of golf balls; if you are forced to make significant changes in your way of life because of poor vision, you will probably want, **and can**, have your cataract removed.

Cataract surgery is the most successful of any surgery on the body with success rates of 98% or higher.

Preparing for Surgery

There are several steps that are required prior to surgery. A standard medical examination and laboratory tests will be performed by your medical doctor to ensure your general health for surgery. Your eye will be measured by painless ultrasonic waves (Intraocular Lens Biometry) to determine the dimensions of your eye and the prescribed power of the intraocular lens implant that will be required to correct your vision, once the cataract has been removed.

Intraocular Lens Biometry

While biometry, the method used to calculate the power of the Intra-Ocular Lens (IOL) which will be used to replace your “clouded lens” or cataract, is very accurate in the majority of patients, the final result may be different from what was planned for many reasons. Most commonly, as the eye heals the IOL can shift very slightly toward the front or the back of the eye. The amount of this shift is not the same in every patient and it may cause different results than predicted. Errors in measurement, machinery, or calculations can also cause the result to be different than expected. Patients who are highly nearsighted or highly farsighted have the greatest risk of differences between planned and actual outcomes. Patients who have had LASIK or other refractive surgeries are especially difficult to measure precisely and may have very different outcomes than planned. If the eye’s visual power after surgery is considerably different than what was planned, glasses or contact lenses may be needed. Surgical replacement of the IOL might be considered, or refractive laser surgery may be used to correct the error. There may be additional costs for these procedures.

Cataract Surgery

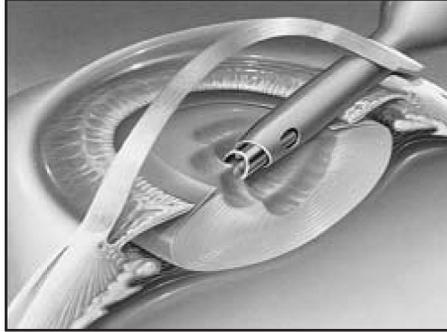


Fig. 2: Removing the Clouded Cataract by Phacoemulsification

There are several methods used to remove cataracts. Each has its advantages and disadvantages. **Each patient is evaluated individually** for the type of surgery and type of intraocular lens implant (IOL) best suited for their particular cataract and their particular eye.

Some physicians and acquaintances may tell you they had “laser removal” of their cataract. There is no laser technique for removal of the “original” cataract. They have probably had Phacoemulsification, and are “calling” it laser - even though it is not. **The Phacoemulsification technique** (Fig. 2) is the most advanced technique for cataract removal and is normally performed on an outpatient basis under local or topical anesthesia. The operation takes about 20 minutes and is usually painless during and after the surgery.

The lens of the eye is like an orange with a “peel” around the outside and a central core (Fig. 1, P.4). We call the outside peel the **CAPSULE** and the inner core, the **CATARACT**. In the **Phacoemulsification technique**, the front “capsule” or “peel” is removed. The core or cataract is then broken into many small particles by an ultrasonic probe and suctioned out of the eye, leaving the posterior capsule (peel) behind (Fig. 2). A plastic, acrylic, or soft silicone lens implant (Fig. 3) is then placed where the natural lens was, resting on the posterior capsule (peel). **Intraocular lens implants** (Fig. 3) are the most natural way to restore your vision after cataract surgery and are used in almost all cases.

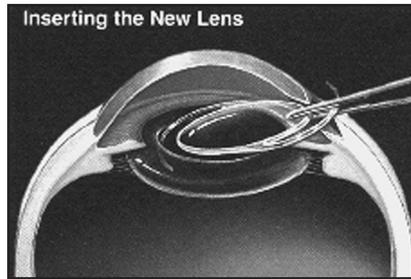


Fig. 3: Inserting the New Lens

There are several “Intraocular lens implant” options available to achieve distance vision and/or near vision after the cataract or “clouded lens” has been removed.

Types of Intraocular Lens Implants:

1. **Monofocal Lens Implant** - You can choose to have a monofocal (single focus) lens implant for distance vision and wear separate READING GLASSES for near vision. This is the “conventional” procedure (costs are usually “deductibles” only, if you have insurance or Medicare).
2. **Monovision Lens Implant** - Lens implants with two different powers can be placed in each eye. One eye will have near vision and the other eye will have distance vision. This combination of one distance eye and one reading eye is called monovision and would allow you to see distance and read without glasses. This technique has been employed quite successfully in many contact lens and refractive surgery patients; however, results of this technique cannot be guaranteed. There is an added, “out-of-pocket” cost for this technique (ask office staff for fees).
3. **Multifocal IOL (Lens Implant)** - Dr.’s Mackman and VanBuren could also implant a “multifocal” IOL (lens implant). These IOLs provide distance vision AND restore some or all of the near vision **in both** eyes. Depending upon the technological features of the IOLs, they may be described as “accommodating”, “apodized diffractive”, or “presbyopia-correcting.” All of these lenses are “multifocal,” meaning they correct for both distance vision **and “one”** other range, *either* **near or intermediate.** When these lenses are used, the procedures are referred to as “Premium Procedures” and there are “added”, out-of-pocket costs for these procedures (ask the office staff for fees).

These surgeries are usually performed using a “**clear corneal, small incision-sutureless technique**”, though a single suture is sometimes needed.

Astigmatism Correction:

Astigmatism is a condition where the eye is shaped more like a football than a baseball with different curves at different angles. This means that there is no single point of focus, but rather multiple focal points (Fig.4). With cataract and lens implant surgery, most people without astigmatism will see reasonably well after surgery in the distance even without glasses. Glasses will be needed for near vision no matter what (unless a multifocal lens is chosen).

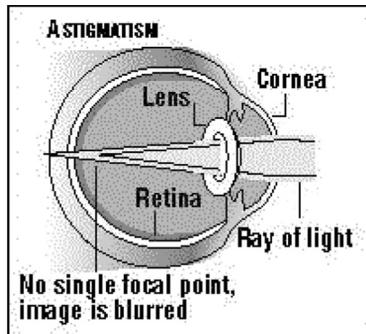


Fig. 4: Astigmatism: no single point of focus

This is not true for patients with astigmatism who **will need glasses after surgery for distance and near vision** if the astigmatism is not corrected. The astigmatism can be corrected in one of two ways:

1. LRI – Limbal Relaxing Incisions are incisions in the cornea, which reduce or eliminate the astigmatism.
2. Toric lens implants correct astigmatism internally within the lens implant itself.

Either method will likely allow patients with astigmatism to see in the distance without glasses, just like those patients without astigmatism (or near if a multifocal implant is used). There are added, “out-of-pocket” costs for these procedures (ask office staff for fees).

When Lasers Are Used

In a certain percentage of patients (about 30%), at any time after surgery the posterior capsule, which is left behind, may become cloudy and the vision may again become impaired months or years after cataract surgery. This “clouding” is referred to as a **secondary membrane**. Should this occur, a small opening must be made in the clouded capsule to allow light to pass

through to the retina. This previously required another major surgery, but now there is a laser available in our office, which can remove this membrane. The YAG laser can be used to remove a cloudy capsule in just a few minutes and allows you to go right home! Visual improvement usually occurs within a day or two.

Post-Operative Period

You will be placed on eye medications, which will be labeled. It is very important that you take all medications as directed and bring all medications with you to follow-up appointments.

In Addition, You Should:

1. Wear glasses or a metal shield at all times for protection.
2. Do not lift any heavy objects over 5-10 pounds, including grandchildren, for one week.
3. Do not do any straining, including during bowel movements.
4. **If bowel movements are difficult, let the doctor know and a stool softener will be ordered.**
5. Do not bend below waist level for more than 10 minutes at a time.
6. Do not wash your hair for one day, and limit the amount of water getting into the eye when washing your hair, and when showering, etc.
7. You may bend to put on your shoes and pick something up off the floor. You may read for short periods, go to the movies, and be up and around, in general. **The key is common sense. Just take everything easy for a week or so.**
8. We do not recommend driving for one week after surgery, as you are likely to be blamed for any accident that occurs shortly after your eye surgery.
9. No sexual activities for three days.
10. You may read for short periods, up to 10 minutes, for the first two weeks.
11. If you have any questions, please do not hesitate to let us know.

Risks of Cataract Surgery:

1. Complications of removing the natural lens may include hemorrhage (bleeding); rupture of the capsule that supports the IOL; perforation of the eye; clouding of the outer layer of the eye (corneal edema, which can be corrected with a corneal transplant); swelling in the central area of the retina (called cystoid macular edema, which usually improves with time); retained pieces of lens (cataract) in the eye (which may need to be removed surgically); detachment of the retina (which is usually an increased risk for highly nearsighted patients, but which can usually be repaired); uncomfortable or painful eye; droopy eyelid; increased astigmatism; glaucoma; double vision; abnormal pupil size, shape or function; wound leaks; macular hole; malposition or movement of IOL; or unexplained poor vision. These and other complications may occur whether or not an IOL is implanted and may result in poor vision; total loss of vision, or even loss of the eye. **Additional surgery may be required to treat these complications.**
2. Complications associated with the IOL may include increased night glare and/or halos, scratches on the lens, double or ghost images, dislocation of the IOL, or incorrect IOL power. Multifocal and Toric IOLs may increase the likelihood of these problems. In some instances, corrective lenses or surgical replacement of the IOL may be necessary for adequate visual function following cataract surgery.
3. Complications associated with local anesthesia injections around the eye include perforation of the eye, destruction of the optic nerve, interference with the circulation of the retina, droopy eyelid, double vision, respiratory depression, hypotension, cardiac problems, and in rare situations, brain damage or death.
4. If monofocal IOLs are implanted, either distance or reading glasses or contacts will be needed after cataract surgery for adequate vision (conventional surgery).
5. Complications associated with monovision. Monovision may result in problems with impaired depth perception since one eye sees in the distance and the other sees near. Choosing the wrong eye for distance correction may result in feeling that “things are the wrong way around”. Once a surgery is performed, it is not always possible to undo what was done, or to reverse the distance eye and near eye without further surgery.
6. Complications associated with multifocal IOLs. While a multifocal IOL can reduce dependency on glasses, it might result in less sharp vision which may become worse in dim light or fog. It may also cause some visual side effects, such as rings or circles around lights at night. It may be difficult to distinguish an object from a dark background, which will be more noticeable in areas with less light. Driving at night may be affected. If you drive a considerable amount of time at night or perform delicate and detailed “up-close” work requiring closer focus than just reading, a standard monofocal lens in conjunction with eyeglasses for near vision may be a better choice for you. If complications occur at the time of surgery, a monofocal IOL may need to be implanted instead of a multifocal IOL. There is no guarantee that all near focus ability will be restored with these lenses.

7. Specific complications of lens implantation: insertion of an intraocular lens may lead to complications which otherwise might not occur. In some cases complications may develop during surgery from implanting the lens or may occur days, weeks, months, or even years later. Complications, in addition to those listed above, may include: loss of corneal clarity, infection, uveitis, iris atrophy, glaucoma, bleeding in the eye, inability to dilate the pupil, increased night glare and/or halo, double or ghost images, dislocation of the lens, retinal detachment, loss of vision, or loss of the eye itself. In some instances, lens power measurements may be in error, resulting in the need for corrective lenses/glasses or surgical replacement of the intraocular lens. If an IOL is implanted, it is done by a surgical method. It is intended that the small plastic, silicone or acrylic IOL will be left in the eye permanently.
8. If complications occur at the time of surgery, the doctor may decide not to implant an IOL in your eye, even though you may have given prior permission to do so.
9. Other factors may affect the visual outcome of cataract surgery, including other eye diseases such as glaucoma, diabetic retinopathy, age-related macular degeneration, the power of the IOL, your individual healing ability, and, if certain IOLs are implanted, the function of the ciliary (focusing) muscles in your eyes.
10. The selection of the proper IOL, while based upon sophisticated equipment and computer formulas, is not an exact science and errors can occur. After the eye heals, its visual power may be different from what was predicted by preoperative testing. You may need to wear glasses or contact lenses after surgery to obtain your best vision. Additional surgeries, such as IOL exchange, placement of an additional IOL, or refractive laser surgery, may be needed if you are not satisfied with your vision after cataract surgery. There are additional costs involved if these surgeries are needed.
11. The results of surgery cannot be guaranteed. If you choose a multifocal IOL, it is possible that not all of the near (and/or intermediate) focusing ability of your eye will be restored. Additional treatment and/or surgery may be necessary. Regardless of the IOL chosen, you may need laser surgery to "fine tune" vision. There may be added costs if further procedures are required. At some future time, the IOL implanted in your eye may have to be repositioned, removed surgically, or exchanged for another IOL.
12. If your ophthalmologist has informed you that you have a high degree of hyperopia (farsightedness) and/or that the axial length of your eye is short, your risk for a complication known as nanophthalmic choroidal effusion is increased. This complication could result in difficulties completing the surgery and implanting a lens, or even loss of the eye.
13. If your ophthalmologist has informed you that you have a high degree of myopia (nearsightedness) and/or that the axial length of your eye is long, your risk for a complication called a retinal detachment is increased. Retinal detachments can usually be repaired, but may lead to vision loss or blindness.
14. Since only one eye will undergo surgery at a time, you may experience a period of imbalance between the two eyes (anisometropia). This usually cannot be corrected with glasses because of the marked difference in the prescriptions,

so you will either temporarily have to wear a contact lens in the non-operated eye or function with only one clear eye for distance vision. In the absence of complications, surgery in the second eye can usually be performed within three to four weeks, once the first eye has stabilized.

Possible problems to watch for after surgery:

As with any surgical procedure, the possibility of complications, as listed under Risks of Surgery, can occur. In spite of advances that have increased the safety of cataract surgery and the best efforts of expert surgeons, complications can and do arise. Possible complications range from minor irritations of the eye to total, irreversible loss of vision or loss of the eye. It is important to know that the chances of having an excellent result after surgery are 99%. Fortunately, the more serious complications are the least common. The more common problems are usually easily treated.

If you have any of the following problems listed below, after surgery, please call us as soon as possible. **DO NOT WAIT!**

1. REDNESS OR IRRITATION
2. PAIN
3. BLURRING OF VISION
4. FLASHING LIGHTS, FLOATING OBJECTS, OR LOSS OF PART OR ALL OF YOUR VISION

If there are any unusual changes in vision or any other unusual symptoms - please call us!

The Cost of Cataract Surgery

Our staff will explain all the expected costs of the operation, most of which are covered by Medicare or private insurance or your PPO or HMO when conventional or standard lens implants are chosen. **Speciality lenses**, as listed previously in this booklet, **if chosen by the patient**, will **add additional, “out-of-pocket” fees**. Please ask about these fees if you are interested in these special lenses or procedures.

Conclusion

You may have additional questions regarding cataracts or surgery after reading this booklet. Please do not hesitate to ask us. We will be happy to answer whatever questions you may have.

PHOENIX OPHTHALMOLOGISTS

EYE CARE AND LASER VISION CENTER



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