

Chapter 5

LASIK and LASEK

How is LASIK performed?

LASIK is an acronym for *Laser In Situ Keratomil-eusis*. This procedure has had immediate success and popularity in the U.S. because of its minimal discomfort, rapid visual recovery, and precise computerized control. There are four basic steps to this process, combining the best features of the earlier PRK and ALK procedures (described in Chapters 7 and 8). Dr. Chynn is highly trained in both the LASIK and LASEK procedures. He is very knowledgeable and has written several articles about both types of surgeries.

- **Step one: Preparing for surgery**

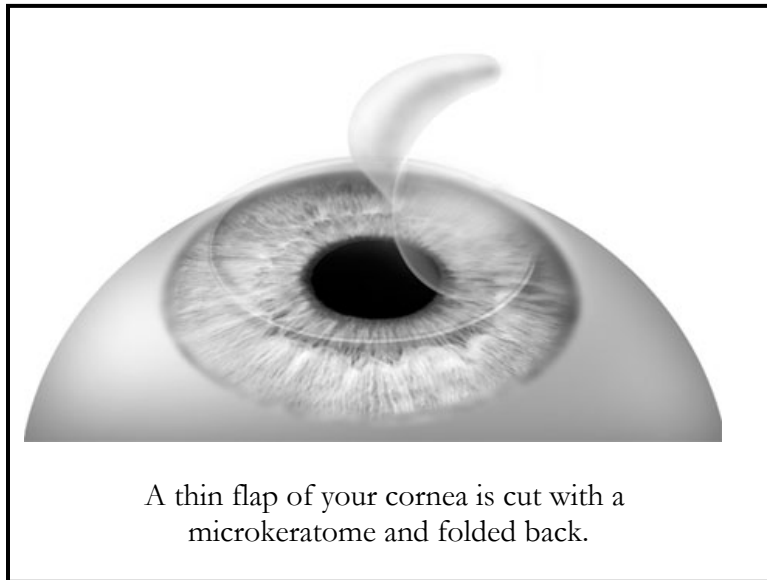
This procedure is performed while you are lying down on an operating table. *Antibiotic* and *anesthetic* eye drops are administered to prevent infection and numb the area. A speculum is used to keep the eyelids open, and a small ring with blue dye is used to mark the cornea and serve as a reference point for Dr. Chynn.

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- **Step two: Creating the flap**

Dr. Chynn will use a **microkeratome** to slice a hinged flap from the central zone of the cornea. The microkeratome is preset according to the thickness of the cornea, and it operates in with a suction ring that holds the eye perfectly still. This suction is activated by a vacuum tube to raise and flatten the cornea while the flap is being created.

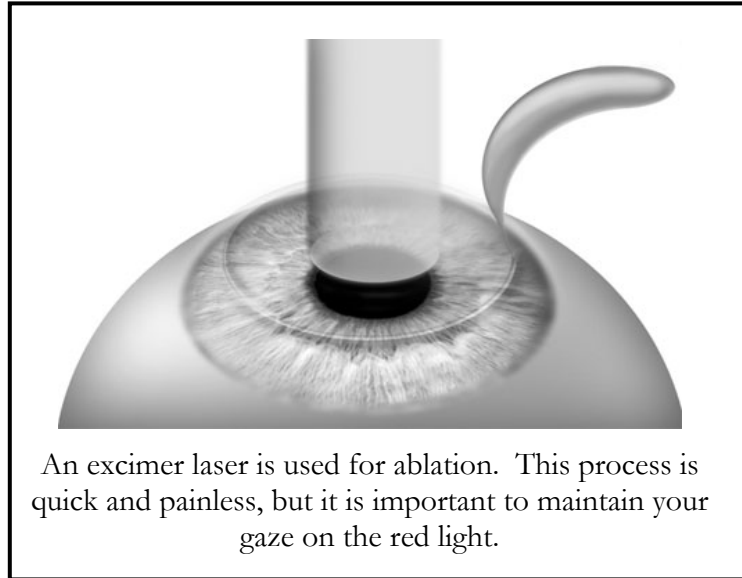
You will feel pressure on your eye during this point and your vision will be impaired while these procedures take place, but you will not feel pain. Once the flap is created, the suction ring and microkeratome are removed, and the flap is folded back to prepare for the next step.



- **Step three: Activating the laser**

During this phase, you will see a small, red light inside the laser. Dr. Chynn will dim the lights in the room to help the patient focus on the red light. This is called

fixation, and it is very important to maintain your gaze on this light because the laser tracks the movements of the cornea and will stop pulsing if it senses that your eye is moving around. Once the laser senses that the cornea is stably positioned, it will begin sending pulses of energy to **ablate** (vaporize) the corneal tissue. This will result in a crackling sound and a very slight burning odor. This part of the process takes anywhere from a few seconds to almost a minute, depending on the severity of the prescription being corrected. Since your eye was previously numbed, this is a completely painless process.



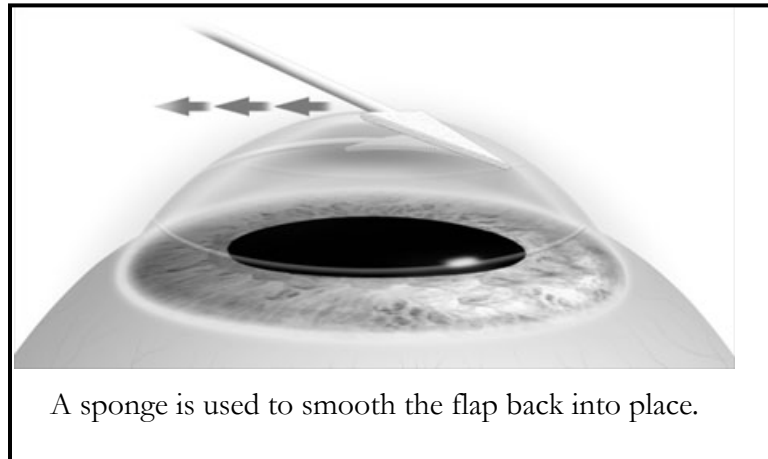
- **Step four: Replacing the flap**

Once the laser has completed its job, Dr. Chynn will smooth the flap back into place and irrigate the eye with a sterile solution. Antibiotic drops will also be placed in the eye to prevent infection. The flap will begin healing on its own, and should reseat by the next day.

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As the numbing drops wear off, some scratchiness and light sensitivity is expected to occur immediately after surgery. Frequent eye drop medication is necessary to prevent swelling, infection, and discomfort. Dr. Chynn will give you the necessary prescriptions and a ***protective shield*** to wear over your eyes for the first few days.

You will return for your first post-operative visit the next day, at which time Dr. Chynn will check to make sure the flap is healing properly. Expected vision at this time will range from 20/20 to 20/40, depending on the amount of ablation that was performed.



Advantages of LASIK

LASIK has virtually supplanted older procedures such as PRK and ALK. This is mainly because of its computerized laser control and its retention of the epithelium that covers and protects the cornea. PRK removes this epithelium, which increases chances of scarring (see Chapter 6). ALK, on the other hand, creates a flap as is done in LASIK, but does not have the precise control that is characterized by the use of a computerized laser (see Chapter 7). LASIK is also advantageous because it can be used to

treat hyperopia and astigmatism as well as higher degrees of myopia.

What is Wavefront-Guided LASIK?

Wavefront-guided LASIK, also known simply as wavefront, is recommended for patients who have a lot of **higher-order aberrations**. These aberrations affect the quality of vision – causing night glare, halos, and problems with contrast sensitivity – and can occur in addition to myopia, hyperopia, and astigmatism.

The degree of your myopia, hyperopia, or astigmatism is classified as a **lower-order aberration**, and these can be corrected with eyeglasses, contact lenses, or conventional LASIK. However, conventional LASIK may exacerbate the vision problems experienced by people with higher-order aberrations, whereas wavefront can be used to treat myopia, hyperopia, and astigmatism without increasing the degree of higher-order aberrations. In some cases wavefront can also be used to treat and reduce higher-order aberrations.

The wavefront procedure is the same as that of conventional LASIK. The only difference is in the pre-operative evaluative testing that is performed. An **aberrometer** is used to measure the extent of a patient's corneal aberrations and produce a clinical ablation profile prescription. The computer-guided laser is given this information and, as in conventional LASIK, the laser operates on the cornea according to the pre-operatively determined prescription.



Wavefront-guided LASIK gives you a customized ablation, and is recommended for people with a large degree of higher-order aberrations.

For more information about wavefront (also known as a CustomVue procedure), you can visit the website <http://www.personalbestvision.com>. This website is updated by VISX, the company that developed this specific technology.

Should I have Wavefront LASIK?

Anyone who is a good candidate for conventional LASIK can choose to undergo the wavefront procedure, but wavefront is usually unnecessary for most patients. The difference between these two procedures is comparable to buying clothes from a store, or getting clothes

custom-made. Although a custom-made shirt may be necessary for some people because of a physical irregularity, the vast majority of the population can find well-fitting clothes in any store.

Dr. Chynn will evaluate the degree of higher-order aberrations in your eyes and let you know if you *should* have wavefront, but you are always welcome to opt for this procedure if you do not mind the extra cost. This procedure is more expensive because it is a relatively recent advancement, and the cost of the extra equipment needed for new technologies are very expensive.

Is Wavefront better than conventional LASIK?

For most patients, conventional LASIK will have virtually the same outcome as wavefront. However, there is a slightly higher percentage of conventional LASIK patients who report problems with nighttime glare and halos around bright objects. It is recommended that patients who are at higher risk for experiencing these problems undergo the Wavefront procedure. Dr. Chynn can tell you if you are in this higher risk category. There is no difference between the two procedures in terms of safety and other surgical risks.

If you have already had conventional LASIK and are currently experiencing problems with night vision and contrast sensitivity, you may be able to reduce these conditions with a ***wavefront LASIK enhancement***. Wavefront can be used to reduce corneal aberrations that interfere with vision quality without affecting your current prescription.

What is LASEK?

Laser Epithelial Keratomileusis, or LASEK, is a newer form of laser vision correction that combines many of the benefits of the two most commonly performed procedures – LASIK and PRK (See Chapter 7 for more information on PRK). It is used to treat astigmatism, myopia, or hyperopia. In LASEK, the epithelium, or outer layer of the cornea, is cut not with the microkeratome cutting tool used in LASIK, but with a 20% alcohol solution.

What are the advantages of LASEK?

There are two main advantages that LASEK has over LASIK:

- Complications associated with cutting and reattaching the flap in the cornea as is done in LASIK are avoided.
- LASEK causes dry eye syndrome less frequently than LASIK.

What are the disadvantages of LASEK?

- Longer visual recovery time compared to LASIK. Many LASEK patients will not fully recover functional vision for 1-2 weeks while their eyes heal, which is similar to the healing time experienced in PRK. LASIK patients often have good vision by the day after surgery.
- LASEK may cause more pain and discomfort than LASIK. Most LASEK patients say the discomfort lasts about 2 days or less.
- Patients need to wear a ***bandage contact lens*** for about 3-4 days after LASEK to serve as a protective layer between your eyelids and the treated eye surface. LASIK patients typically need a bandage contact lens for only 1 day or less.

- Patients must use topical steroid drops for several weeks longer than that used after LASIK.

What are the side effects?

Many of the side effects from LASEK are similar to those seen from LASIK. These may include:

- Sensation of having a foreign object in your eye. This can last from anywhere from 1-4 days.
- Temporary reduced vision under poorly lit conditions, lasting up to several months.
- Dry eyes, requiring the use of *artificial tear drops*.
- Hazy or cloudy vision, but this should disappear within 6-9 months.

How Do I Know if this Procedure Is For Me?

LASEK may be better for patients who have steep or very thin corneas, which make it difficult for the surgeon to make a proper LASIK flap. Since traumatic injury to the eye is more serious after LASIK than LASEK, patients who engage in professional or leisure activities that put their eyes at increased risk for injury (such as boxing) may choose to have LASEK. LASEK *is* better for people who suffer from dry eye syndrome because in avoiding a deeper flap, the corneal nerves responsible for the tearing reflex are not cut.

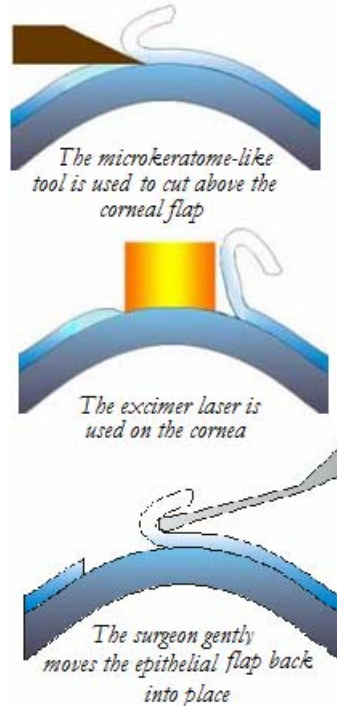
What Happens During the Procedure?

After the LASEK procedure, expectations are similar to what can be expected after LASIK. Keep in mind, even though the flap created by LASEK heals in about a day, you will have to wear a bandage contact lens for up to 4 days after surgery. You will also experience some minor irritation in your treated eyes for 1-2 days following surgery. For patients who undergo the LASIK procedure, good vision is usually attained in a few days. For LASEK this may take as long a week.

The Epi-LASIK Procedure

About five years ago, world-renowned ophthalmologist and “Father of LASIK” Ioannis Pallikaris introduced epi-LASEK to the eye care scene. This relatively new procedure has been hailed as having all the benefits of PRK with quicker recovery time and less pain. Since the epithelial flap is not completely removed in this procedure, a major advantage to epi-LASIK is the avoidance of possible complications such as wrinkled or dislodged flaps during the healing process.

The epi-LASIK procedure involves separating the epithelium from the underlying corneal layer using a microkeratome-like tool that does not make any major cuts. The flap is then moved aside so Dr. Chynn can properly treat your eyes with the excimer laser. Following the application of the laser, the thin epithelial flap is placed back into its original position. Because no significant cuts are made in the epithelium or underlying corneal layers, recovery time for this procedure is generally 3-4 days, while recovery time for PRK and LASEK is between 5 and 7 days.



Patients who are good candidates for the epi-LASEK procedure tend to have thinner corneas and are probably not suited for ordinary LASIK because they may have too little tissue to create a LASIK flap.

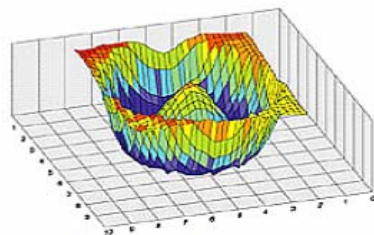
Although epi-LASIK is a newer procedure, it has several advantages over older and more conventional surger-

ies. Surgeons who have used epi-LASIK have reported fewer cases of dry-eye complications. In addition, the *Chinese Journal of Ophthalmology* reported in March of 2005 that epi-LASIK has proven to be an effective method for treating high myopia with only slight irritation.

The epi-LASIK procedure, albeit a recent innovation, is still very effective. Every day, more and more patients opt for this procedure because of its safety, efficiency, and better recovery time. Dr. Chynn and his staff at IWANT2020 will do their best to help you choose the procedure that best suits your eyes.

The CustomVue LASEK Procedure and why so many patients prefer it

In effort to better serve their patients, the top refractive surgeons in the county have developed a technology that combines two of today's leading laser vision correction procedures into one. CustomVue WaveFront ablation and Blakdeless, All-Laser, No-Cut, No-Flap LASEK have been fused together in order to create a more precise and safer method of LVC. This new procedure is called CustomVue LASEK.



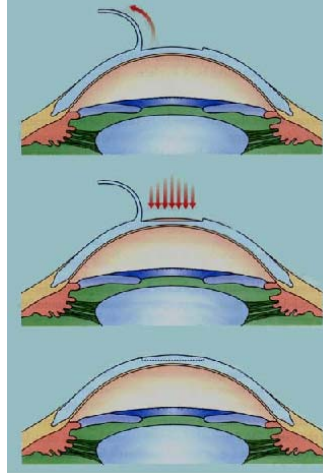
the "fingerprint" of your eye

Prior to CustomVue LASEK, laser vision correction surgeries were "one-size-fits-all," and surgeons could only correct "lower-order aberrations" such as astigmatism, myopia, and hyperopia. However, with the advent of CustomVue WaveFront technology—originally developed by NASA in order to correct the Hubble Telescope—

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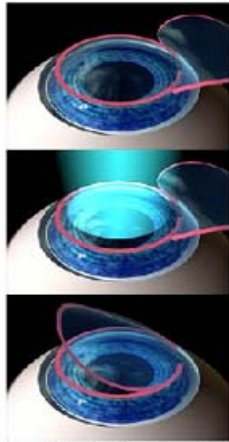
surgeons can now use a computer-generated “fingerprint” of your eye, called a WaveMap. A WaveMap is essentially a 3-D model of your eye surface, containing each and every tiny imperfection. Dr. Chynn uses the WaveMap during surgery to guide the laser and treat your eyes where treatment is needed most. Since CustomVue LASEK is more precise than eyeglasses or contact lenses, patients often see *better* after surgery than they did with eyewear before surgery!

The LASEK portion of this procedure combines the safety of PRK and the rapid recovery of LASIK. PRK involves the removal of the epithelial flap in order to allow the laser to access your cornea. In LASIK, the surgeon will cut into the cornea with a microkeratome blade—or IntraLase laser—and will lift this flap in order to perform surgery. Since nothing is removed, LASIK has a shorter recovery time, but because the flap must heal, complications such as incomplete, and “button-hole” flaps may occur. On the other hand, the LASEK procedure involves a single epithelial sheet that is folded back and then replaced after surgery.



The LASIK procedure

LASEK versus LASIK



The LASEK procedure

When considering which procedure to have for yourself, keep these tips and facts in mind:

- 1) LASEK is safer than LASIK because there is no flap-removal involved. In addition, if any harm is done, your epithelium will grow back in a few days so there is nothing to worry about.
- 2) LASIK is better for younger people, while LASEK works well for people of all ages
- 3) Recovery time for LASEK is longer than that for LASIK (3 days versus 1 day)
- 4) Long-term risks of LASEK may include nighttime glare and mild haze, while long-term risks of LASIK may include regression, flap dislocation, and halos.
- 5) However, with the dawning of CustomVue, LASEK has many more advantages than LASIK and is the preferred method for over 90% of patients.

While results may vary from patient to patient, most people experience dramatic improvement in their vision. In a recent FDA study, 98% of patients saw 20/20 or better after their CustomView LASEK procedure. Many people reported significant improvement in their vision, which shows the effectiveness and power of this new technology.

Which Procedure is Right for Me?

The information provided to you in this chapter is meant to educate you on the Laser Vision Correction process. While much of this information is highly technical and we do not expect you to be as informed as a medical technician, we want you to have the proper tools necessary to make the right decision. Utilizing the knowledge you have gained and the resources available to you at IWANT2020, Dr. Chynn will help you make the best decision for you and your eyes. Based on your, medical history, expectations and desires from eye surgery, lifestyle (contacts, sports, etc.), and pre-surgical testing (corneal thickness), we will help you make an informed choice about your surgery. Remember: an informed patient is a good patient!