

Laser in-situ keratomileusis (LASIK)

LASIK- Laser in situ keratomileusis or in simple words remodeling or reshaping of cornea. This is popularly known as laser correction surgery for patients who want to get rid of their glasses or contact lenses permanently. LASIK can correct myopia (nearsightedness), hyperopia (farsightedness), or astigmatism. The surgeon uses an excimer laser to cut or reshape the cornea so that light focuses properly on the retina. However, patients with higher degrees of refractive error (more than 10 diopter) may still need some type of corrective lens.

Selection criteria:

1. Age more than 18 years
2. Stable Refractive error at least for 6 months
3. Myopia up to 8 diopter, hyperopia up to 5 diopter, astigmatism up to 3 diopter

Exclusion criteria:

1. Pathological myopia
2. Irregular corneal surface
3. Severe Dry eye

There are two types of LASIK. The standard LASIK procedure and customized LASIK. Now we have newer more precise femtosecond laser technology.

Diagnosis/Preparation: Before LASIK, patients need to have a complete eye evaluation and comprehensive medical history taken. Soft contact lens wearers should stop wearing their lenses at least one week before the initial exam.

Pre-operative examination:

1. Comprehensive medical history to determine if there are underlying medical problems that will prevent a successful surgery.
2. A complete eye exam to determine refractive error, uncorrected visual acuity and best corrected visual acuity.
3. A cycloplegic refraction using eye drops to dilate the pupils
4. Corneal mapping, a keratometer reading to determine the curvature of the central part of the cornea

5. Slit lamp exam to determine any damage to the cornea and evidence of glaucoma and cataracts.
6. Retinal examination to check for retinal holes and macular degeneration and macular disease and glaucoma.
7. Corneal pachymeter to measure the corneal thickness.
8. Pupilometer to measure the pupil.

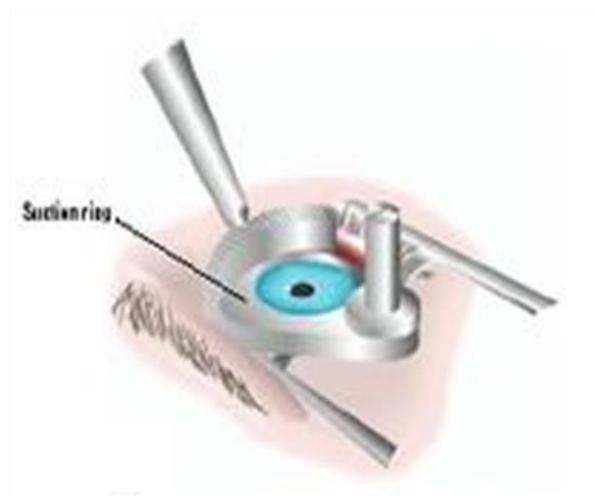
Standard LASIK

The procedure takes to 15 minutes to perform and the results are immediate. Immediately before the procedure, the ophthalmologist may request corneal topography (a corneal map). The surgeon may also measure the corneal thickness if he didn't previously.

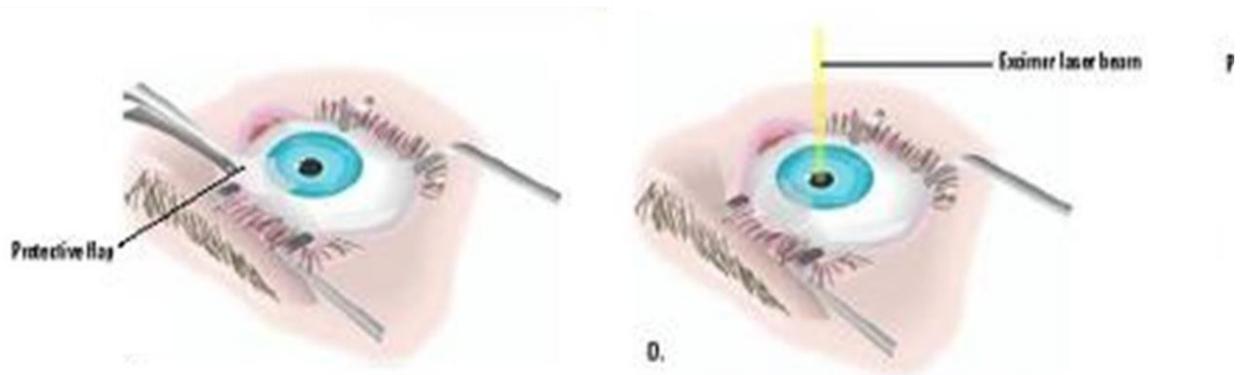
After the prep work is completed, the patient reclines on a laser bed and the surgeon is seated directly behind the patient. Usually both eyes are operated on same day. An eyelid speculum is inserted in the eye to be treated first to hold the eyelids apart. The patient stares at the blinking light of a laser microscope and must fixate his or her gaze on that light. The patient must remain still throughout the procedure.

In LASIK surgery, the eye is held open with a speculum, and a suction ring is attached to the eyeball

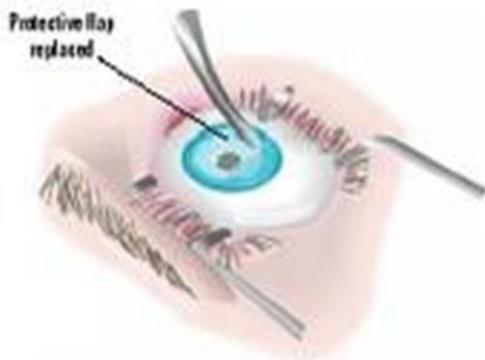
Step 1: A microkeratome is used to shave the protective flap off the top of the eye which is then pulled back



Step 2: A computer-controlled laser is used to reshape the cornea. Laser companies provide an algorithm to determine the correction level, and the surgeon may alter the level because of a patient's special needs. Once the stroma is exposed, the laser ablation begins, ranging from 30 to 60 seconds. The ablation flattens the cornea of myopic patients; steepens the cornea of hyperopic patients; and reshapes the cornea of astigmatic patients.



Step 3: The protective flap is replaced. Saline solution is squirted to remove any debris and enable the flap to move back into place without interruption. The surgeon ensures the flap is in place and removes any wrinkles.



Aftercare: After LASIK, patients may experience burning, itching or a foreign body sensation. They should be advised not to touch the eye as that could damage the flap. Patients may also experience glare, starbursts, or halos that should improve after the first few days. Patients are advised to seek help immediately if they feel severe eye pain, or if symptoms worsen.

The first follow-up visit is from 24 to 48 hours after surgery. Patients is advised to stay away from strenuous activity, such as contact sports, for at least a month. In some cases, if the vision does not meet expectations and the surgeon believes it can be further corrected, he will perform an enhancement. Enhancements are usually done for under-correction.

Complications:

Complications are rare. Surgeons separate LASIK complications into two categories.

Intra-operative risks

- Flap complications. Newer microkeratomes have reduced the likelihood of "free caps," where the cap becomes unhinged. An experienced surgeon replaces the cap after ablation. In some cases, the procedure must be aborted while the eye heals.
- Laser hot spots. Higher energy surrounding the laser beam can cause irregular astigmatism. Proper laser testing before the procedure eliminates this risk.
- Central islands. This refers to a raised area in the central part of the treated zone that receives insufficient laser treatment. Any raised area can decrease the laser's effectiveness. The island either shrinks by itself or can be remedied with retreatment.

Post-operative complications

- Undercorrection or overcorrection. Undercorrection can usually be treated with an enhancement, but over-correction will require the use of eyeglasses or contact lenses.
- Dry eye. This also can be permanent or transient. Most patients experience some dry eye immediately after surgery. Some patients continue to experience dry eye and are treated with artificial tears or punctal plugs.
- Displaced flap. Occurs after the eye is hit or rubbed. If immediate attention is given by the surgeon, who must lift the flap and clean under it, no long-term effects occur.
- Nonspecific diffuse intralamellar keratitis. Commonly known as Sands of the Sahara, this complication can range from corneal haze to eye clouding that resembles swirling sand. It is treated with topical steroids, although severe cases may require eye irrigation.
- Epithelial ingrowth. The cells of the lower cornea migrate under the corneal cap. The surgeon must lift the cap and remove the cells. If untreated, vision is impaired.

- Striae. These are wrinkles in the flap that can reduce visual acuity. The surgeon must lift the corneal flap and smooth the wrinkles.
- Photophobia. Extreme sensitivity to light can last a few days or a week after surgery.
- Infection. This rarely occurs after LASIK. It is treated with **antibiotics** .

Custom LASIK

With Custom LASIK, surgeons use a wavefront analyzer (aberrometer) that beams light through the eye and finds irregularities based on how the light travels through the eye. It creates a three-dimensional corneal map to create a customized pattern for each patient. For standard LASIK, each patient with the same refractive error is treated with the same setting on the excimer laser, barring a few adjustments. The new technology individualizes treatment not only for refractive errors, but also for visual disorders that previous corneal mapping technology could not detect. Custom LASIK can successfully treat glare, night vision and other contrast problems.

Results:

After LASIK, most patients are able to see well enough to pass a driver's license exam without glasses or contact lenses. Some patients may still need corrective lenses, but the lenses won't need to be as powerful as previously they were using. Approximately 90% of persons become 6/6 without the need of glasses or contact lens. If patients are being treated for myopia, they should be aware they will have to rely on spectacles with the onset of presbyopia.