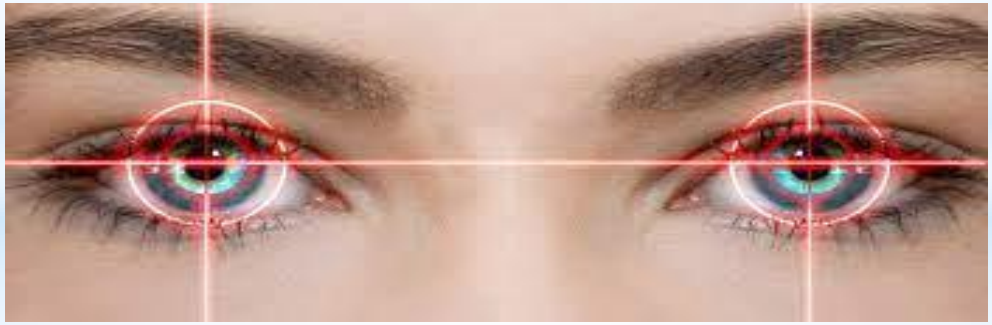
LASER in Ophthalmology



Types Of LASER Ophthalmomlogy

*Excimer Lasers (LASIK,PRK)

*Double Freuency Nd/YAG laser

*Micropuls laser

*Confocal Scanning Laser Ophthalmology (CSLO)

*Laser Doppler Flowmetry (LDF)

Excimer Lasers

Excted Dimer

a laser that uses a noble-gas halide to generate radiation usually in the ultraviolet region of the spectrum.

Excimer Lasers light pulse-emitting gas lasers, forming an excited dimer by an electric discharge of a gas mixture containing an inert gas and a halogen gas that produces a molecule ArF that exists only in the excited state .

Wavelengths 248 nm and 193 nm , in ophthalmology 193nm wavelength is used.

Excimer laser burn without heat nighbor tissues.

Excimer laser is used in photorefractive surgery to correct refractive error as in LASIK and PRK.

LASIK

Laser-assisted in situ keratomileusis.

is the best known and most commonly performed laser refractive surgery to correct refractive error.

In this procedure we used Excimer laser to reform the shape of cornea, application of laser is done after flap in the anterior part of stroma.

Flap of LASIK is done by using either a mechanical instrument called a microkeratome, or a femtosecond laser to create the flap.

*When a femtosecond laser is used to create the LASIK flap, the procedure is described as Femto-LASIK surgery.

The LASIK technique has been used to correct up to

***15 D of myopia**, 6 D of hyperopia, and up to 6 D of astigmatism.

Corneal Topogryphy is very essential to assess if cornea can tolerate photorefractive surgery

Important Take in Considration for the Patiant

- **You should be at least 18 years old** (21 for some lasers). The vision of people younger than 18 still is changing.
- **You shouldn’t be pregnant or nursing**. It might change the measured refraction of the eye.
- **A history of “dry eye” could matter.**
- **Cataract?, Glaucoma?**
- **Cornea State? (keratoconus)**

Benefits of LASIK

- Standard procedure: LASIK has been the standard treatment for over 20 years, and many surgeons are very experienced with this procedure.

- Quick recovery: Typically, vision becomes clearer within a couple of hours after surgery and gradually stabilizes over the following weeks.

- High availability: LASIK is currently the most popular and prevalent form of laser eye surgery. Most clinics offering Laser Vision Correction have the technology available for this procedure.

Preparing for surgery

* **Before and on the day of surgery**
* Before surgery patients are usually directed by their doctor to:

- Stop wearing hard contact lenses for at least four weeks and soft lenses for two weeks before surgery, because they may interfere with preoperative diagnostic tests.

- Don’t make-up, perfume or lotion the day before and on the day of the procedure. These products may leave debris around the eye and eyelashes, which increases your chance of infection.

- Arrange for alternative transportation directly after the surgery, if you usually drive yourself, and possibly for the next few days following surgery.

After surgery

* After surgery, it is recommended to:

- Not rub the operated eye, and to rest and not overexert yourself.
- Wear protective glasses the day after surgery to prevent accidentally moving the flap by rubbing the eye.
- Wear a patch while sleeping for a week to avoid accidentally scratching the eye and moving the flap.
- Use eye drops for a few days following the surgery to prevent infection and alleviate dryness.
- Avoid strenuous contact sports for at least two weeks.
- Doctors require a follow-up exam the day after surgery and again a month.
- Within a few days after treatment, patients are normally able to drive, work and wear make-up

Risks

- **Blindness and irreversible eye damage.** In rare cases, errors during surgery (like the malfunctioning of the laser device) or complications after surgery (for example, inflammation) may cause irreversible damage to the eye, including permanent blindness. In other cases, the problems can be corrected with additional surgeries or other treatments.
- **Vision loss.** You may not see as well after the surgery — even with glasses or contacts — as you did with glasses or contacts before the surgery. Or, you may need glasses or contacts to see as well as you did before surgery.
- **Severe night vision problems**. You may develop debilitating visual symptoms, particularly glare, halos, and/or double vision that can seriously affect nighttime vision.

- **Decrease in contrast sensitivity, “crispness,” or sharpness.** Objects may appear fuzzy or grayish. Even with good vision on the vision chart, you may not see as well in situations of low contrast — like at night or in fog — after treatment compared to before.
- **Severe dry eye syndrome.** As a result of surgery, your eye may not be able to produce enough tears to keep it moist and comfortable. Dry eye not only causes discomfort, but can reduce visual quality due to intermittent blurring and other visual symptoms. This condition may be permanent. Intensive drop therapy and use of plugs or other procedures may be required.

Complications

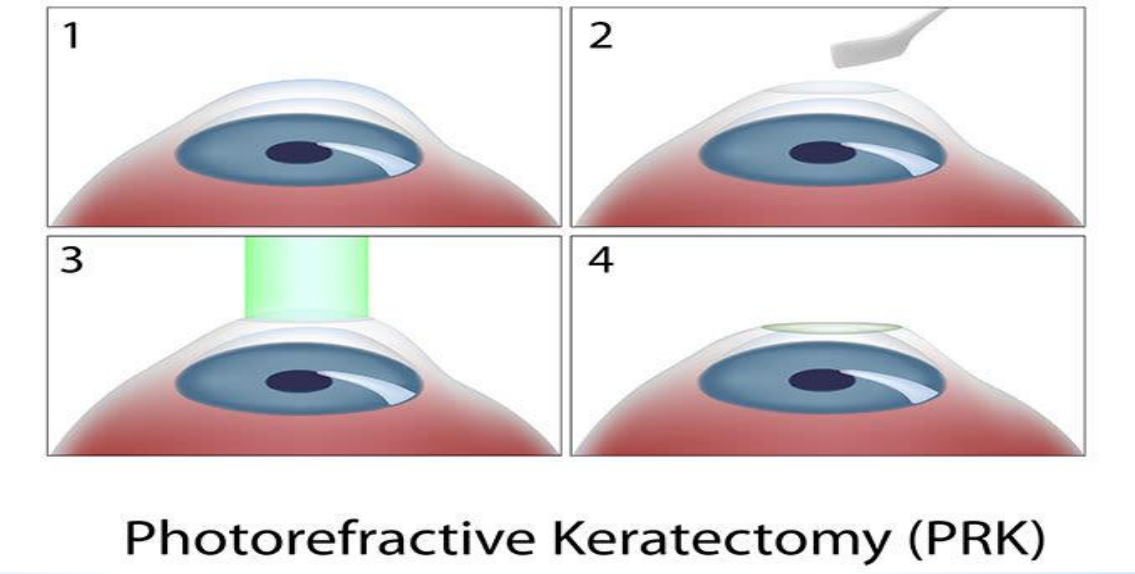
- **Corneal infection or inflammation.** These problems may require additional surgery or other treatments.
- **Problems with the corneal flap after surgery.** These include irregular or incomplete flaps, ingrowth of cells under the flap that may need to be surgically removed, and irregular healing that results in a distorted cornea, which can only be corrected with a corneal transplant.

PRK

Photorefractive Keratectomy

PRK a laser eye surgery that corrects refractive vision error by changing the shape of the cornea.

Technique of PRK completely removes the epithelium to access the cornea, apply excimer laser, apply mytomicine, covering the exposed part of cornea with bandage, contact lens and then the epithelium grows back.

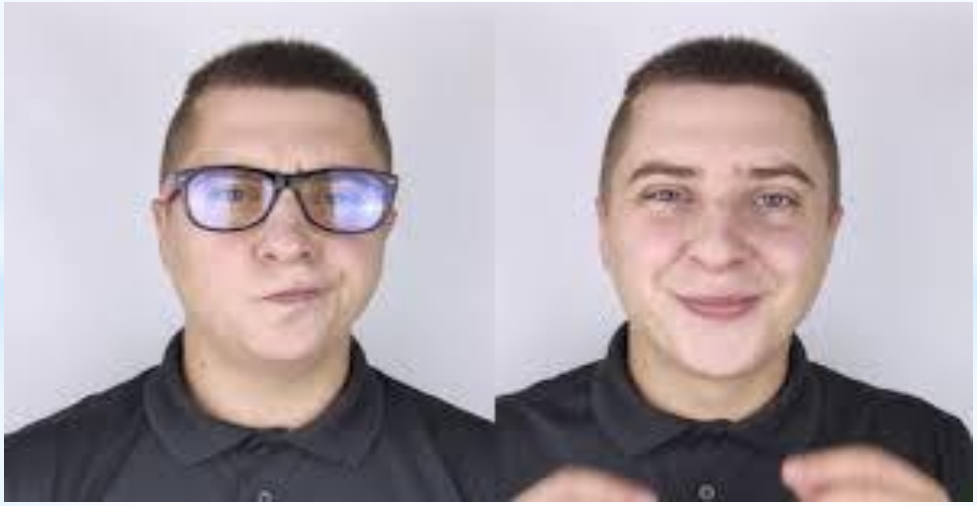


Photorefractive Keratectomy (PRK)

Benefit of PRK

- It is often recommended for people who have very thin cornea.
- It can also be a good choice for those who have dry eyes.
- It may also be a better option for people who are at higher risk of eye injury, such as from sports or certain jobs.

PRK can correct up to -6 D in myopia, +3 D in hyperopia, 3 D in astigmatism.



Side effect and complication of PRK

- PRK will take longer for the eye to fully heal, around one week to a month.
- Immediate pain, tearing, photophopia.
- Under or overcorrection
- Corneal haze
- Decreased night vision
- Glare and halos
- Overall decreased vision
- Blindness

Important Take in Considration for the Patiant

Preparing for surgery

After surgery

* As in LASIK

LASIK vs PRK	
LASIK	PRK
Corneal flap creation with possible flap complicaion	No corneal flap (safer)
Mild pain, less haziness	Sever pain, more haziness
Shorter recovery	Longer recovery
Not suitable for dry eye or thin cornea	Suitable for dry eye or thin cornea
Suitable for high degree of refractive error	Suitable for high degree of refractive error