PRK, LASEK, and Epi-LASIK for Nearsightedness

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Surgery Overview

PRK (photorefractive keratectomy), LASEK (laser epithelial keratomileusis), and epi-LASIK (epithelial laser in-situ keratomileusis) use a laser to reshape the cornea. By reshaping the cornea, these surgeries allow light to focus on the retina and thereby correct a person's vision.

With PRK, the top layer on the surface of the cornea (epithelium) is removed. Then the laser reshapes the cornea. The laser removes tissue from the cornea very accurately without damaging nearby tissues. The layer grows back during the healing process. PRK may be used to correct nearsightedness and astigmatism at the same time.

With LASEK, the surface layer of the cornea is loosened and pushed to the side. After the laser reshapes the cornea, the surface layer is placed back over the cornea.

Epi-LASIK is similar to PRK and LASEK. With epi-LASIK, the surface layer over the cornea is lifted with a special machine. Like LASEK, the layer is replaced over the cornea after the laser reshapes the cornea.

PRK, LASEK, and epi-LASIK are sometimes called surface ablation. They are different from LASIK (laser in-situ keratomileusis) because they do not involve cutting flaps of the cornea.

Many people have PRK or LASEK done instead of LASIK because of the shape and condition of their eyes. LASEK may also be safer for people with certain lifestyles, such as professional athletes, police officers, and firefighters.
What To Expect After Surgery

PRK, LASEK, and epi-LASIK are outpatient procedures. They are done under local anesthesia in a surgeon's office or a same-day surgery center. The procedure takes about 30 minutes, most of which is spent preparing your eye and the laser. The actual treatment time is very short. Most treatments take a minute or less (treatment for farsightedness may take longer than a minute). The entire process may take about 2 hours, including preparation time, care right after the surgery, and paperwork.

After surgery, you may wear a patch or contact lens on the eye and get a prescription for pain medicine. Someone must drive you home and then back to the surgeon's office the next day. During this second visit, the surgeon will examine your eye and prescribe eyedrops to prevent infection and reduce inflammation. More follow-up visits are required, usually the next week and then throughout the first year after surgery.

- Recovery from these surgeries is longer and more painful than recovery from either radial keratotomy (RK) or laser in-situ keratomileusis (LASIK). But you may return to your normal activities within a few days.
- For 2 to 3 days after surgery, some people may have pain, aching or throbbing, or a feeling that there is something in the eye.
- Your vision will be reduced for several days after surgery. Your vision may remain blurry for days to weeks after surgery. Do not drive until your vision has cleared.
- For 2 weeks after surgery, avoid vigorous sports, eye makeup, and activities that may get water in the eye. The surgeon may recommend that you shower before the surgery and then avoid showering for a day or two afterward to keep from getting water in the eye.

Unstable vision is common in the first 3 months after surgery and may last for up to 1 year. The surgery does not always give 20/20 vision. So you may still need to wear glasses or contact lenses after the surgery. Your vision may vary slightly over the course of a day (although not to the point that you would need two pairs of glasses).

Why It Is Done

PRK, LASEK, and epi-LASIK are similar surgeries and are done for similar reasons. The American Academy of Ophthalmology considers them safe and effective for mild to moderate nearsightedness. Most people with nearsightedness fall in this mild-to-moderate range.

PRK, LASEK, and epi-LASIK may not be appropriate for people who have more severe nearsightedness (high myopia), because the results are harder to predict, complications are more likely, and regression is more likely. Also, PRK may not be appropriate if you have keloids.
In general, for correcting nearsightedness over 3 diopters, PRK, LASEK, epi-LASIK, and LASIK are considered more effective than radial keratotomy (RK).

PRK, LASEK, and epi-LASIK are elective, cosmetic procedures that correct nearsightedness in otherwise healthy eyes.

The procedure may not be done during pregnancy or breastfeeding. You also may not be eligible for the surgery if you have an uncontrolled autoimmune or connective tissue disease.

**How Well It Works**

PRK, LASEK, and epi-LASIK work well to reduce mild to moderate nearsightedness.\(^1\)

Overall, the results of these surgeries are stable over the long term. The results have improved as techniques and lasers have evolved and changed.

These surgeries tend to have more stable results than RK, with less need for retreatment and less hyperopic shift, or increasing farsightedness, for 8 to 10 years after surgery. For instance, about 86 out of 100 people have vision within 1 diopter of the intended surgical correction 1 year after PRK.\(^2\)

Almost everyone notices improvements in their vision after one of these surgeries. But not everyone gets perfect 20/20 vision. Studies show that after PRK or LASEK:\(^1\)

- More than 94 out of 100 people have 20/40 vision or better.
- More than 61 out of 100 people who had PRK and more than 74 out of 100 people who had LASEK have 20/20 vision or better.

In a study done one year after epi-LASIK treatment, all of the people's eyes had 20/40 vision or better. And more than 3 out of 4 eyes had 20/20 vision or better.\(^3\)

In general, most people with mild or moderate nearsightedness can expect to have uncorrected vision of 20/40 or better (without glasses or contacts) after surgery. Results in people who are more nearsighted are harder to predict.

**Risks**

The risks associated with PRK, LASEK, and epi-LASIK are similar.

The problem most commonly associated is clouded vision (sometimes also referred to as haze). Some people's eyes have some clouding of the cornea as a result of healing. This clouding may occur within a year after surgery and then clear up. It has been linked with
spending a lot of time in the sun. Clouding appears to be more common in people who are very nearsighted. Some doctors may give you eyedrop medicine during and/or after the surgery to lower the chance of haze. Some doctors may recommend avoiding direct sunlight for a while after your surgery, taking vitamin C, and wearing sunglasses.

Other complications of these surgeries may include:

- Night vision problems, such as halos (often described as a shimmering circle around light sources such as headlights or street lamps).
- Glare, or increased sensitivity to bright light.
- Double vision (diplopia), usually in one eye. Some people describe this as "ghosting" around an object, rather than a doubling.
- New astigmatism.
- Overcorrection or undercorrection.
- Regression. As the cornea heals, cells may fill in the area that was shaped by the laser, causing at least some of the nearsightedness to come back. Regression may also occur if the treated area thickens as part of the healing process. Regression may occur up to 2 years after surgery. Some doctors suggest medicines to limit regression.
- Loss of best corrected vision, which is the best possible vision you can achieve using glasses or contact lenses. This is not common, but the risk rises with severe nearsightedness.

Retreatment may be desired if you have residual nearsightedness that results from undercorrection or regression.

Serious but rare complications may include:

- Infection.
- Sores (ulcers) on the cornea.
- Elevated pressure inside the eye (intraocular pressure) and glaucoma.

Experts do not yet know about all of the long-term side effects or complications.

What To Think About

If you are considering having surgery to improve nearsightedness, consider all the options (including LASIK, PRK, LASEK, epi-LASIK, corneal ring implants, intraocular lens implants, and radial keratotomy), and discuss them with your doctor. Ask your doctor the questions that you have about surgery (for example, what are the risks, benefits, and possible outcomes) so that you understand your options and can make the best decision.

PRK, LASEK, epi-LASIK, and LASIK surgery have replaced radial keratotomy as the refractive surgeries chosen by most people.
Talk with your doctor about the risks and benefits of correcting both eyes on the same day compared with doing one eye at a time on separate days.

There is no agreement about whether surface ablation surgeries are superior to LASIK, or vice versa, for people with mild to moderate nearsightedness. But with high degrees of nearsightedness, LASIK is often preferred because of the risk of clouding (haze) with PRK, LASEK, and epi-LASIK.

The cost of refractive surgery varies in different locations, but this surgery can be very costly. Most insurance companies do not cover the cost of refractive surgery, because it is a cosmetic procedure.

Nearsightedness: Should I Have Laser Surgery?

Complete the surgery information form (PDF) to help you prepare for this surgery.

References

Citations

Other Works Consulted

Credits

By Healthwise Staff
Primary Medical Reviewer  Kathleen Romito, MD - Family Medicine