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### **Photorefractive keratectomy (PRK)**

Photorefractive keratectomy (PRK) is a procedure in which the surface of the cornea is reshaped by an ophthalmologist using an Excimer laser. PRK may be used to treat myopia (nearsightedness), hyperopia (farsightedness), or astigmatism. PRK does not involve creation of a corneal flap utilizing the microkeratome, and therefore, the protective superficial layers of the cornea must heal post-operatively. This generally means that patients who undergo PRK will require significantly more time than LASIK patients to achieve their best vision. The main advantage of PRK, is that patients who are not candidates for LASIK due to certain corneal conditions or corneal scars, can often be effectively treated with PRK eye surgery.

Although the outcomes of PRK and LASIK are quite comparable at the 6 month post-operative visit, it has been argued that LASIK may be safer than PRK due to the greater risk of scarring (haze) and unpredictable healing of the cornea with PRK. The risk of infection is also slightly higher with PRK than with LASIK, although infections following either procedure are rare.

Both PRK eye surgery and LASIK eye surgery are used to treat myopia, hyperopia, and astigmatism, and both procedures work by using a laser to reshape the eye's corneal tissue and correct vision. However, the procedures are performed differently and have distinct advantages and disadvantages.

During LASIK eye surgery, the surgeon uses a microkeratome blade or a laser to create a corneal flap. This flap of tissue is then folded back, exposing the inner cornea where the treatment will take place. Afterwards, the flap is repositioned. During PRK eye surgery, however, the surgeon accesses the cornea's inner layers by removing the thin outer layer of the cornea, the epithelium, altogether. After the PRK procedure, bandage contact lenses are worn to promote healing of the epithelium.

#### **The PRK Procedure**

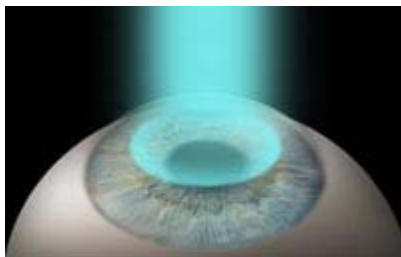
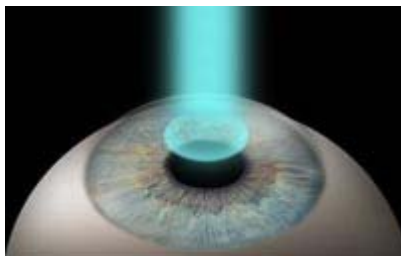
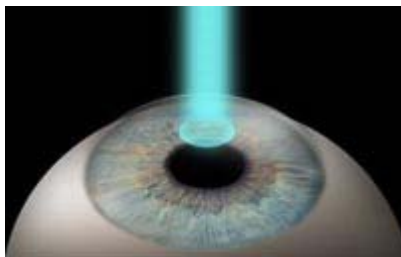
Patients who wear soft contact lenses or rigid gas-permeable contact lenses should discontinue their contact lens wear at least 3 days or 3 weeks prior to the evaluation, respectively. Prior to the PRK procedure, one or more careful refractions (determinations of eyeglass correction needed) will be completed. Contact lens wearing patients who are believed to have an unstable refraction will be asked to discontinue contact lens wear and return for a repeat refraction in one to three weeks. When back-to-back refractions are stable (equivalent), the procedure may be scheduled. Corneal topography, or a detailed surface map of the cornea, will also be completed to rule out keratoconus and irregular astigmatism of the cornea.



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A few minutes prior to the PRK procedure, anesthetic drops will be applied to the eye to numb the eye and prevent pain during the procedure. A speculum will be placed to hold the lids apart for the procedure, eliminating any concern that blinking during the procedure would present a problem. The eye surgeon will then gently remove the surface corneal cells (epithelium) and proceed with the laser aspect of the procedure. The laser, being computer driven for accuracy and precision, is programmed based on the patient's refractive error (nearsightedness, farsightedness, astigmatism).

The laser delivery takes less than one minute for most patients. Once the refractive ablation is completed, i.e., the corneal curvature is reshaped, the surgeon will place a bandage contact lens on the eye for improved comfort along with anti-inflammatory and antibiotic eye drops. The patient can usually leave the laser center within a few minutes following the procedure.



Post-operatively, most patients will need to be re-evaluated one day, three days, one week, one month, two to three months, and four to six months following the PRK procedure. The bandage contact lens can usually be removed on the second or third post-operative day when the epithelium is healed. Most patients will only require eye drops to control healing during the first 6 to 12 weeks, but other patients may require topically applied medications for up to 6 months or more following the procedure. In general, the greater the refractive error, the more likely the patient is to require eye drop medications for a prolonged period following the procedure.

#### **Visual Results with PRK**

PRK results are very similar to LASIK results, at least for patients up to approximately 6.0 diopters of myopia (nearsightedness). However, in general, PRK patients will have a somewhat slower recovery of their best vision than LASIK patients. Studies at the 6 month postoperative visit in LASIK and PRK patients show essentially equivalent results with this range of myopia. Results of the Phase III Excimer Laser Photorefractive Keratectomy for Myopia study showed that for corrections between 1.50 and 6.00 diopters,

66.5% of eyes achieved 20/20 or better uncorrected visual acuity and 92.2% achieved 20/40 or better.

#### **Indications for the PRK Procedure**

- Appropriate levels of nearsightedness, farsightedness, or astigmatism
- Relative intolerance of glasses or contact lenses



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- Properly motivated and realistic patient

PRK may be used to treat nearsightedness (myopia), farsightedness (hyperopia), and astigmatism. However, not all Excimer lasers are presently FDA approved to treat all three types of refractive errors. For example, some Excimer lasers are not yet FDA approved to treat farsightedness. Your surgeon can provide this information to you at your request.

PRK is an elective procedure which, like any procedure, has risks and benefits. In general, indications for surgery must include an appropriate level of nearsightedness, farsightedness, or astigmatism, as well as an educated and properly motivated patient with realistic expectations. The best candidate for PRK is an individual who desires to be less dependent on glasses or contact lenses, is willing to accept the risks of the procedure, and understands that an enhancement procedure may sometimes be required. The primary potential risks include postoperative glare, halos or starburst around lights at night, and infection in the cornea with loss of best corrected visual acuity. Fortunately, risks that threaten vision in the eye, such as infection in the cornea, are very rare.

### **Does PRK Surgery Hurt?**

Many patients are concerned that PRK will hurt. To ensure maximum comfort, numbing eyedrops are used and most patients report that the procedure itself is pain-free. The first few days following your PRK procedure, however, your eyes may hurt slightly as the epithelium heals and covers the treated area. Eye drops, pain medication, and protective contact lenses may be used to minimize this discomfort, and most patients find that they are able to resume normal activities within one to three days. However, PRK recovery and healing can vary.

### **What to Expect After PRK Surgery**

Immediately after the procedure, a bandage contact lens will usually be applied to the eye. This contact lens is worn for the first 2 to 3 days until the surface epithelium is healed. Expect at least a few visits to your EyeMD during the first 6 months following surgery, with the first visit being one to three days following surgery. When the surface epithelium is healed, the eye will be comfortable, and the bandage contact lens is removed. Eye drops are required to prevent infection and control inflammation following surgery. Your vision will gradually improve. Generally, vision will be good enough to drive a car within two to three weeks following surgery, but your best vision may not be obtained for up to 6 weeks to 6 months following surgery.