



## photorefractive keratectomy

a closer look

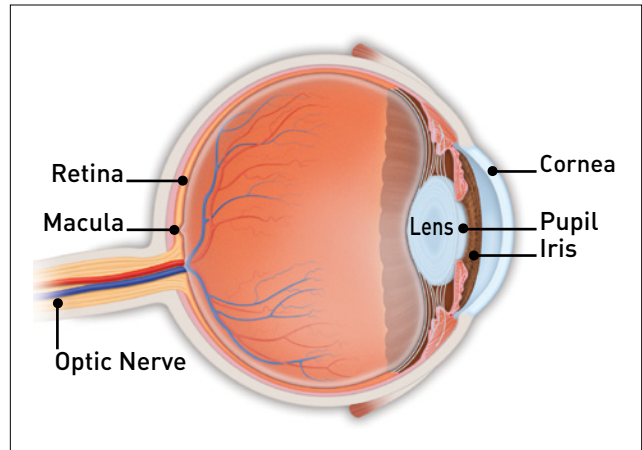
### HOW WE SEE

Light rays enter the eye through the clear cornea, pupil and lens. These light rays are focused directly onto the retina, the light-sensitive tissue lining the back of the eye. The retina converts light rays into impulses that are sent through the optic nerve to your brain, where they are recognized as images.

### REFRACTIVE ERROR

The eye's ability to refract or focus light sharply on the retina may be affected by a variety of conditions. When the eyeball is too long, visual images are focused in front of the retina, and **myopia**, or near-sightedness, results. When the eye is too short, images are focused beyond the retina. This causes **hyperopia**, or farsightedness. If the cornea is not perfectly round, then the image is refracted or focused irregularly, resulting in a condition called **astigmatism**. Similarly, an irregularly-shaped natural lens or problems with the way it functions also can cause focusing problems. These various focusing problems can cause light rays to bend or refract at odd angles, leading to blurry or distorted vision. This inability to achieve sharp focus is called refractive error.

There are a number of methods used to correct refractive errors, including eyeglasses, contact lenses, and refractive surgery.



### WHAT IS PHOTOREFRACTIVE KERATECTOMY?

**Photorefractive keratectomy (PRK)** is an out-patient surgical procedure used by ophthalmologists (Eye M.D.s) to treat myopia, hyperopia and astigmatism. With PRK, an excimer laser is used to sculpt the cornea, permanently changing its shape to improve the way the eye focuses light onto the retina.

### AM I A GOOD CANDIDATE FOR PRK?

To be a candidate for PRK, you must have a stable and appropriate refractive error, be free of eye disease, be at least 18 years old, and be willing to accept the potential risks, complications, and side effects of PRK. You should not have a significant skin or systemic disease that could affect healing. You should also not have a history of excessive scarring. If you meet these requirements, PRK may be appropriate for you to correct your refractive error.

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If you are considering refractive surgery, PRK may be a better choice if you have dry eye or thin corneas, either of which may prevent you from having some other forms of refractive surgery, such as LASIK.

Also, if you have a very active lifestyle or occupation, PRK may be a good option. With refractive surgeries such as LASIK that involve creating a corneal flap, there is a danger that the flap could be dislodged accidentally while engaged in high-risk activities. No flap is created during PRK.

PRK may also be used after cataract surgery to fine-tune vision when necessary if accommodative or multifocal IOLs have been implanted.

### WHAT HAPPENS BEFORE SURGERY?

Before you have PRK surgery, your ophthalmologist will give you a complete, preoperative eye exam to measure your prescription and check for any conditions that might affect the procedure. Your ophthalmologist will determine if you are a good candidate for PRK based on this examination.



**Pachymetry is used to measure the thickness of your cornea.**

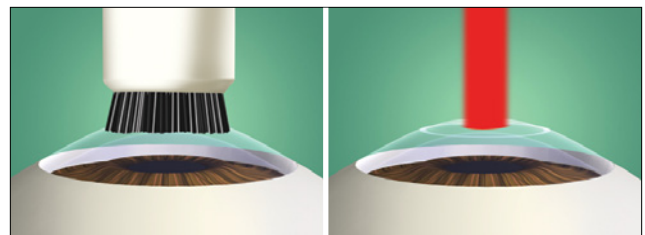
When you arrive on the day of surgery, anesthetic eyedrops are put in your eyes. An eyelid speculum is placed on the eye to keep your eyelid open during the procedure. The other eye is patched.

### HOW IS PRK DONE?

The PRK procedure takes only about 15 minutes. The **epithelium**, the outer layer of the cornea, is usually removed with a special brush, though a blade, alcohol or a laser can also be used.

Once the epithelium is removed, an excimer laser is used to remove a thin layer of corneal tissue. Your ophthalmologist guides the laser with a computer, and the laser beam sculpts the surface of the cornea, decreasing the steepness of curvature for nearsightedness or increasing the steepness of curvature for farsightedness. To treat astigmatism, the laser is programmed to selectively reshape specific portions of the cornea more than others. The laser flattens areas that are steeper than normal and steepens areas that are flatter than normal.

PRK corrects your refractive error and eliminates or reduces the need for eyeglasses or contact lenses. Because no incisions are made, the procedure does not weaken the structure of the cornea.



**With PRK, a special brush may be used to remove the outermost layer of the cornea, the epithelium (left); a laser removes tissue from the cornea to reshape it (right).**

### WHAT HAPPENS AFTER SURGERY?

Immediately following surgery, a “bandage” contact lens is placed on the eye to promote healing, and you will need to use eyedrops for up to a month. You should have someone drive you home following surgery, and your surgeon may suggest that you take a few days off from work. Your surgeon may also ask that you avoid strenuous activity for up a week, as this could slow the healing process.

You may experience some discomfort immediately following surgery, lasting for two to three days. Over-the-counter medications usually control the pain. Occasionally, some patients may need topical anesthetics or other prescription medications for pain control.

### WHAT ARE THE RISKS, COMPLICATIONS AND SIDE EFFECTS?

Like any other surgery, PRK has risks and complications that should be carefully considered. Possible complications of PRK include undercorrection or overcorrection, both of which can often be improved with eyeglasses, contact lenses, or an additional laser surgery.

Other possible complications of PRK include:

- glare and halos around lights, particularly at night;
- corneal scarring and corneal haze;
- corneal infection.

Most complications can be treated without any loss of vision. Permanent vision loss is very rare. There is an extremely small chance that your vision will not be as good after surgery as before, even with eyeglasses or contact lenses. This is called a loss of best-corrected vision.

### WHAT WILL MY VISION BE LIKE AFTER PRK?

Initially, your vision is blurry following PRK. The healing process takes three to five days, during which time your vision will gradually improve, though it may take a month or longer to achieve your best vision.

It is important that anyone considering PRK have realistic expectations. PRK allows people to perform most of their everyday tasks without corrective lenses. However, people looking for perfect vision without eyeglasses or contact lenses run the risk of being disappointed.

Recent studies show that over 90 percent of people who have PRK achieve 20/40 vision or better without eyeglasses or contact lenses. If the procedure results in an undercorrection or overcorrection, your surgeon may decide to perform a second surgery, called an enhancement, to further refine the result.

PRK cannot correct **presbyopia**, the age-related loss of close-up focusing power. Almost everyone will need reading glasses by the time they reach the age of 40 or 50, including those who have had PRK. Some people choose a vision correction method called **monovision**, which leaves one eye slightly nearsighted. The nearsighted eye is used for close work, while the other eye is adjusted for distance vision. Although monovision is acceptable for most people, some may not be comfortable with this correction. To determine your individual needs and your ability to adapt to this correction, you may wish to try monovision with contact lenses before surgery.

If 20/20 vision is essential for your job or leisure activities, consider whether 20/40 vision would be good enough for you. You should be comfortable with the possibility that you may need a second surgery or that you might need to wear eyeglasses for certain activities, such as reading or driving at night.

**DISCUSS YOUR OPTIONS WITH YOUR EYE M.D.**

If you are considering refractive surgery to decrease your reliance on eyeglasses or contact lenses, discuss with your ophthalmologist whether or not you are a good candidate for PRK. Together you can decide if it is the right choice for you.

**NOTES**

**COMPLIMENTS OF YOUR OPHTHALMOLOGIST:**

**Academy reviewed 04/09**

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