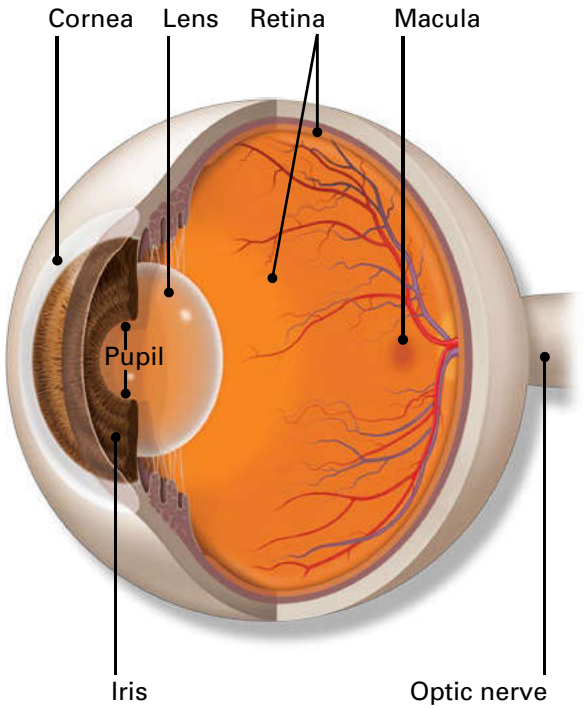
PRK (Photorefractive Keratectomy)

What is PRK (photorefractive keratectomy)?

PRK (photorefractive keratectomy) is a type of refractive surgery. This kind of surgery uses a laser to treat vision problems caused by refractive errors. You have a refractive error when your eye does not refract (bend) light properly.

For you to see clearly, light rays must travel through your cornea and lens. The cornea and lens refract the light so it lands on the retina. The retina turns light into signals that travel to your brain and become images. With refractive errors, the shape of your cornea or lens keeps light from bending properly. When light is not focused on the retina as it should be, your vision is blurry.



Eye Words to Know

Cornea: Clear, dome-shaped window of the front of your eye. It focuses light into your eye.

Lens: Clear part of the eye behind the colored iris. It helps to focus light on the retina (back of the eye) so you can see.

Retina: Nerve layer at the back of your eye. It sends light signals to the brain so that you can see.

With PRK, your ophthalmologist uses a laser to change the shape of your cornea. This improves the way light rays are focused on the retina. PRK is used to treat myopia (nearsightedness), hyperopia (farsightedness) and astigmatism.

The goal of PRK is to correct your refractive error to improve your vision. PRK may reduce your need for eyeglasses or contact lenses. In some cases, it may even allow you to do without them completely.

Who is a good candidate for PRK?

If you have dry eyes or thin corneas and want to have refractive surgery, PRK may be a good choice for you. This is because some other types of refractive surgery, such as LASIK, are not recommended if you have these conditions.

Also, if you have a very active lifestyle or job, PRK may be a better option for you than LASIK or similar procedures. This is because PRK does not involve cutting a flap in your cornea like LASIK and similar surgeries do. If you are highly active, you could accidentally dislodge a corneal flap, causing problems.

Some people who have certain lenses put in their eyes during cataract surgery may have PRK to fine-tune their vision.

To have PRK, you need to meet certain requirements. Here are some of them.

- You should be 18 years or older (ideally, over 21 years old, when vision is more likely to have stopped changing).
- Your eye prescription should not have changed in the last year.
- Your refractive error must be one that can be treated with PRK.
- Your corneas need to be healthy, and your overall eye health must be generally good.
- You need to have realistic expectations about what PRK can and cannot do for you.

Some people are not candidates for PRK. They include people with:

- an unstable (changing) refractive error
- skin or other disease that can affect healing
- a history of a lot of scarring
- cornea abrasions or disease
- advanced glaucoma
- a cataract affecting vision
- uncontrolled diabetes
- pregnant or nursing women
- history of certain eye infections

Your ophthalmologist can talk with you about other conditions that may keep you from having PRK.

To determine whether you are a candidate for PRK, your ophthalmologist will examine your eyes. Here's what will be done.

- The overall health of your eyes will be checked.
- Measurements of your cornea will be taken.
- Your pupil size will be checked.
- Your refractive error will be measured.

What to expect with PRK

Before surgery: You and your ophthalmologist will discuss your vision needs based on your lifestyle. For example, if you play sports, you may be seeking clear distance vision from surgery.

Also, you and your ophthalmologist should discuss your expectations for PRK. People who have PRK to achieve perfect vision without glasses or contacts run the risk of being disappointed. PRK allows people to do most of their everyday tasks without corrective lenses. However, you might need to wear glasses for certain activities, such as reading or driving at night.

Your ophthalmologist will thoroughly examine your eyes and make sure you are a candidate for PRK. Here is what he or she will do:

- **Test your vision.** This is to make sure that your vision has not changed. It also shows how high your refractive error is and whether PRK can be used to correct your vision.

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- **Check for other eye problems.** Your ophthalmologist will make sure that you do not have eye problems. This is because other problems could affect your surgery, or PRK could make those other problems worse.
- **Measure and map the surface of your cornea.** Your ophthalmologist will check the thickness of your cornea and make precise measurements of the cornea's surface. Your eye surgeon uses these measurements to program the computer-based laser used during surgery.
- **Measure your pupil size.** He or she will also measure the size of your pupil.

Pachymetry is used to measure the thickness of your cornea.

During PRK: PRK is usually done in an outpatient surgery center. The procedure usually takes about 15 minutes. Here is what to expect:

- Your eye will be numbed with eye drops.
- Your eye surgeon will place an eyelid holder on your eye to keep you from blinking.
- Then your ophthalmologist will remove the outer layer of cells on your cornea, called the epithelium. To do this, he or she may use a special brush, blade, laser or alcohol solution.
- You will be asked to stare at a target light so that your eyes will not move. The ophthalmologist then reshapes your cornea using a laser. The laser is a special instrument that has been programmed with measurements for your eye. While your ophthalmologist is using the laser, you will hear a clicking sound.

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

After PRK:

- Right after surgery, your ophthalmologist will place a "bandage" contact lens over your eye to help it heal.
- You will need to have someone drive you home after surgery. You should plan to go home and take a nap or just relax after the surgery.
- Your surgeon may suggest that you take a few days off from work. Also, you should avoid strenuous activity for up to a week after surgery, as this could slow the healing process.
- For two to three days after PRK, you may have some eye pain. Over-the-counter medicine usually controls the pain. Occasionally, some people may need eye drop pain relievers or other prescription medicine to relieve pain. Be sure to call your ophthalmologist if your pain is not helped by over-the-counter medicines.

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- You will need to use eye drop medicine for up to a month or as prescribed by your ophthalmologist. Be sure to follow your doctor's instructions for using this medicine to help healing.
- After PRK, you will need to wear sunglasses outside for as long as your doctor tells you. This is because sun exposure can lead to corneal scarring after surgery, causing vision problems.

At first, your vision will be blurry after PRK. Over 3–5 days, as you heal, your vision will gradually improve. Keep in mind it may take a month or longer to achieve your best vision.

What are the risks of PRK?

Like any surgery, PRK carries risks of problems or complications you should consider. These include:

- glare and halos around lights, particularly at night
- scarring of the cornea
- cloudiness of the cornea (called corneal haze)
- corneal infection

Also, with PRK, your vision may end up being undercorrected or overcorrected. These problems often can be improved with glasses, contact lenses, or additional laser surgery.

Most complications can be treated without any loss of vision. However, very rare problems may include:

- having worse vision than before PRK, even with glasses or contacts (called **loss of best-corrected vision**)
- blindness

If you are happy wearing contacts or glasses, you may not want to have refractive surgery. Together, you and your ophthalmologist can weigh the risks and rewards of PRK.

Vision after PRK

About 9 out of 10 people (90%) who have PRK end up with 20/40 vision or better without glasses or contact lenses.

It is important to know that PRK cannot correct **presbyopia**. This is the normal, age-related loss of close-up vision. With or without refractive surgery, almost everyone who has excellent distance vision will need reading glasses starting around age 40.

To help with presbyopia, some people have PRK to get **monovision**. This means one eye is left slightly nearsighted and the other eye is adjusted for distance vision. The brain learns to adapt so that the nearsighted eye is used for close work, while the other eye sees distant objects. Monovision is not for everyone. To see if you are able to adapt to this correction, you will probably want to try monovision with contact lenses first.

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Summary

PRK is a type of refractive surgery. With this outpatient procedure, a laser is used to reshape your cornea, improving how light rays are focused in the eye.

PRK is used to treat myopia (nearsightedness), hyperopia (farsightedness) and astigmatism. It cannot correct presbyopia, the normal loss of close-up vision that comes with age. However, some people have PRK to achieve monovision. This allows them to use one eye for close vision and the other for seeing distant objects clearly.

People who cannot have LASIK because their eyes are dry or their corneas are thin may have PRK to correct vision.

If you have any questions about your eyes or your vision, speak with your ophthalmologist. He or she is committed to protecting your sight.

Get more information about refractive surgery from EyeSmart—provided by the American Academy of Ophthalmology—at **aao.org/refractive-surgery-link**.

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