Orthokeratology and LASIK: What You Need To Know About Vision Correction

northernvirginiaeyecare.com Special Report
Ortho-K

Wouldn't it be great if your nearsightedness could be corrected while you sleep? It might sound far-fetched, but it's a reality for some people. It's called orthokeratology, or ortho-k, and it is available throughout the country.

Here's how it works: When you sleep, you wear special contact lenses that gently reshape the surface of your eye, so you can see clearly even after you remove the lenses. The effect is temporary — generally enough to get you through a day or so, but you must wear the special lenses each night.

Ortho-k: Not a New Idea

Reshaping the cornea with contact lenses to improve vision isn't new. Orthokeratology has been practiced by some eye doctors for decades. However, in the past ortho-k produced mixed results and wasn't FDA-approved for overnight wear, so the procedure had limited appeal.

Then in June 2002, the FDA granted overnight wear approval to a type of corneal reshaping called Corneal Refractive Therapy (CRT). More overnight ortho-k approvals followed.

At the same time, new manufacturing methods and lens designs were enabling orthokeratology lenses to achieve much higher success rates than experienced in the past. The performance of so-called "reverse geometry" or "return zone" designs have fueled new excitement about orthokeratology.

How Does It Work?

Myopia (nearsightedness) is caused by light coming into the eye in such a way that it doesn't focus properly on the retina. Typically, this problem is corrected by using eyeglasses or regular contact lenses to re-focus the light rays.

A similar result can be achieved by reshaping your cornea. LASIK is a surgical way to do this. Ortho-k contact lenses flatten your cornea without surgery, enabling light to focus properly on your retina, resulting in better vision.

Corneal Reshaping Options

Two brands have FDA approval for overnight corneal reshaping: Corneal Refractive Therapy (CRT) from Paragon Vision Sciences, and Bausch & Lomb's Vision Shaping Treatment (VST). Both are fit only by eye care practitioners who have been through each company's certification procedure.

Other ortho-k lens brands without overnight approval are sometimes fit by practitioners for daytime ortho-k, or for overnight ortho-k as an "off-label" use at the doctor's discretion (see sidebar).

Who Is a Candidate?

Orthokeratology is for people of any age who are nearsighted. The FDA has approved CRT for people with up to six diopters of myopia (-6.00 on your prescription); the VST approval is for up to five diopters.
Astigmatism can also be treated: up to -1.75 with CRT, and -1.50 with VST. Many doctors believe the best candidates are people who have low amounts of myopia, about four diopters or less.

The procedures can be performed on practically anyone of any age, as long as their eyes are healthy. Ortho-k holds particular appeal for people who participate in sports, or who work in dusty, dirty environments that can cause problems for regular contact lenses.

Because ortho-k offers similar benefits to LASIK, it's also appealing to adolescents and teens, who are not eligible for LASIK. However, there are some concerns about corneal infections in young people who have used ortho-k, so it's wise to pursue this with an eye care practitioner who is experienced in treating this age group.

What Results Can You Expect from Ortho-k?

Eye care practitioners usually aim for 20/20 vision, but 20/40 vision (the legal minimum for driving in most of the United States) is typically considered acceptable. In the FDA clinical study for approval of CRT, 93 percent of patients achieved 20/32 vision or better, and 67 percent achieved 20/20 or better. In the clinical study for FDA approval of one VST design, about 95 percent achieved 20/40 or better, and 73 percent achieved 20/20 or better. Both studies followed patients over at least a nine-month period.

What to Expect When You Begin

The eye doctor will begin by measuring the curvatures of your corneas using an instrument called a corneal topographer — a painless procedure that takes about a minute and produces a topographical map of your eye's surface. Your doctor might order lenses for you, or some doctors may have an existing inventory.

You may need a series of temporary lenses to see properly until you reach the desired prescription. "My goal is one pair of lenses for each patient," says Marjorie J. Rah, OD, PhD, of the New England Eye Institute. "But for the most part, I'm using two pairs of lenses." Dr. Rah fits CRT as well as other ortho-k designs.

How Long Does Ortho-k Take?

Ortho-k can reshape two to three diopters of myopia in two weeks or less, says Dr. Rah.

During the time your eyes are being reshaped, you can experience side effects. "In the beginning, you'll have glare and halos that will be reduced with time, but may never completely go away," says Dr. Rah. "As with LASIK, patients with large pupils are especially susceptible to this."

Once your eyes reach the desired prescription, you will need to wear lenses when you sleep or during part of the day to maintain your prescription. Discontinuing lens wear altogether allows your corneas to gradually regress to their original shape or close to it.

Is Ortho-k Comfortable?
Some people have comfort issues with daytime wear of GP contact lenses (also known as RGP or "oxygen permeable" lenses), which are used for ortho-k. With GPs, a sensation of lens awareness can result from interaction of the eyelid with the edge of the lens during blinking. (This doesn't happen with soft lenses because they are larger and remain tucked under the eyelids.) But since ortho-k lenses are worn during sleep, blinking and lens awareness are generally not a problem.

**Cost of Ortho-k**

Fitting ortho-k lenses takes much more of a doctor's time than a regular contact lens fit. It requires a series of office visits and potentially multiple sets of lenses. Each eye care practitioner determines his or her fee for orthokeratology, which is based on both time and lens costs.

On average, eye care practitioners will charge $800 to $1,500 for both eyes, according to the lens manufacturers, plus the cost of replacement lenses in subsequent years. This can vary based on the region of the country, urban vs. rural settings, and the type of practice. Normally, ortho-k is not completely covered by vision care insurance plans. (Read how this compares with the cost of LASIK.)

**Should You Have Ortho-k Instead of LASIK?**

Ortho-k works best for people who don't want to wear glasses or contact lenses all day, every day — but don't mind wearing contact lenses at night, or occasionally during the day.

If your primary goal is to be glasses- and contacts-free during the day, then ortho-k might be a good alternative for you. However, if you want to eliminate the bother of contacts altogether, then ortho-k is not likely to satisfy you.

Ortho-k may be a good option if you suffer from dry eyes. It's been found that this condition is sometimes worsened by LASIK.

Unlike LASIK, ortho-k is reversible. If you try reshaping lenses and later decide you want laser eye surgery instead, you can do that. But for a period of time before surgery (possibly several months), your surgeon would have you stop wearing your lenses so your corneas can revert to their natural shape.

As with all contact lenses, there are some side effects and possible complications. Ask your eye care practitioner about the challenges you can expect.

**LASIK**

LASIK eye surgery is used to correct and restore vision to individuals who currently wear glasses for near-sightedness, far-sightedness or astigmatism.

Using surgery to correct vision is not necessarily a new idea; other older procedures, such as radial keratotomy, have been used to correct vision for many years. Now, LASIK is able to achieve the same or better results with less pain and a shorter healing time.
What will happen at the initial consultation?

During the consultation, your physician will talk with you about the changes that you want to make in your vision. He/she will explain the different options available, the LASIK procedure itself, and the risks and limitations involved. He/she will also explain the kind of anesthesia required; the surgical facility used, and costs.

Your physician will begin by asking you for a complete medical history. He/she may also give you specific instructions in preparing for surgery, including guidelines for eating and drinking, smoking, and taking (or avoiding) vitamins, supplements and medications.

If you wear contact lenses, you’ll need to stop wearing them for a specified period of time before your initial consultation or examination. The physician may schedule additional visits to ensure that the eye is stable. This lens-free period is different for hard and soft lenses, so you should ask your doctor to be sure that you have prepared properly.

Take this opportunity to ask all the questions you have about the surgery, and ask to see testimonials and outcome statistics of the doctor’s recent patients, before and after surgery. Also ask for, and follow up on, patient references. Learning everything you can about your options, risks and benefits is the key to making an informed decision. See Questions to ask your doctor below.

How is the procedure performed?

LASIK eye surgery uses lasers to reshape the clear dome or front surface the eye called the cornea, the part of the eye that focuses light onto the retina. If a person is far-sighted, the cornea is too flat. If a person is near-sighted, the cornea is too steep. In either of these situations, the light does not focus perfectly onto the retina.

Your doctor will begin by marking the outermost layer of cornea with a special type of water-soluble surgical ink. A device called a microkeratome creates a thin flap in the outer layer of the cornea. The laser reshapes the exposed layer of cornea, and the flap is realigned. The flap acts like a natural Band-Aid during the healing process. Finally, the doctor administers eye drops to minimize inflammation and risk of infection.

How long does the surgery take?

The surgery takes about 5 to 10 minutes per eye. Both eyes can be done in the same day.

Where will the procedure be performed?

LASIK eye surgery is generally performed in a surgical suite. A mild sedative is usually administered orally before surgery as well. You’ll be awake but relaxed, and although you may feel some mild discomfort, you probably won’t feel any pain. Usually, you’ll be allowed to return home immediately afterward.

How much pain is there?
The amount of discomfort experienced varies from person to person. Most patients report very little discomfort or none at all. The procedure is performed quite quickly – a few minutes per eye. After the procedure, you may experience some mild discomfort or increased light sensitivity.

**What can I expect after the procedure?**

Your physician will instruct you on the most appropriate post-operative care for you. You should be able to return to everyday activities within 2-5 days after the operation. Consult with your physician about driving, swimming and Jacuzzi activity. No make-up for a period of time is also recommended. Your doctor will prescribe special eye drops in order to prevent infection and inflammation. You should avoid sports and any other activities that may cause injury or sweat to run down into the eyes for at least 2 weeks following LASIK surgery. We recommend you follow all post-operative care regime prescribed by your physician.

**What is the recovery period like?**

The recovery period for LASIK eye surgery is relatively short. Short-term side effects, such as sensitivity to light, usually disappear within a couple of days. Blurred vision or visual distortions occur in some patients, but usually disappear within several weeks to and up to 3 months.

**What is the long-term outcome like for most people?**

The long-term outcome for LASIK patients looks promising. Laser eye surgeries have only been used for a little over ten years now. Because it is a relatively new procedure, life long results have not been determined.

**Ideal Candidate:**

In general, the best candidates for LASIK are:

Knowledgeable about the procedure

In good physical and psychological health

Willing to follow directions for optimal results

A desire to improve myopia(nearsightedness), hyperopia (farsightedness) or astigmatism

Realistic in their expectations and know the risks and benefits.

Good corneal curvature, pupil size and good corneal thickness. (Consult with your physician.)

**Risks and Limitations:**

Most patients are pleased with the outcome of their surgeries; however, LASIK eye surgery is not guaranteed to restore perfect eyesight. There is a small risk that distortions from the procedure, such as
blurred or hazy vision, will be permanent. On rare occasions, results of the surgery are worse than before.

Still, over 90% of patients with mild to severe myopia achieve at least 20/40 vision, and many are able to see 20/20. This is from a −1.00 to −10.00 dioptors of nearsightedness. Individuals with more severe sight impairment should expect less from the surgery. For them, LASIK is usually able to improve vision, but not necessarily perfect it.

**Costs:**

A report from a leading industry analyst based on results of a survey of refractive surgeons conducted during the first quarter of 2009 found that average LASIK costs were:

- $2,140 for all laser-based vision correction procedures (including LASIK) in which a single price is quoted.
- $1,748 for non-customized LASIK using a bladed instrument (microkeratome) and excimer lasers that are not guided by wavefront analysis.
- $2,314 for wavefront-guided LASIK using a laser-created flap.

Note that there can be wide variation in what an advertised price will include. Beware of advertising that, for example, promises "LASIK from $499 per eye." Look for the fine print. Typically, only a few select people are actually eligible for LASIK at prices that sound unusually low, because most eyes require more extensive correction or more follow-up after the surgery.

**Choosing a doctor**

It is very important that you select a physician appropriately trained and experienced in this procedure. We strongly recommend that you consider choosing a doctor who is board certified by the American Board of Medical Specialties. See our Physician Locator feature to find an Eye Care Specialist in your area, including detailed profile information for many of the listed doctors. Also read How to Select an Eye Care Physician for a more detailed discussion on choosing the right doctor.

**Questions to ask your doctor:**

For more information on questions to ask your doctor please review article "Questions for your Eye Doctor".

Are the desired results I described realistic?

Where is the surgery performed? How long will the procedure take?

How much will my vision improve?

Is it realistic to expect 20/20 vision in my particular case?
Would another procedure, such as PRK, radial/astigmatic keratotomy, or implantable contact lens work better for me?

Are there other procedures that I should consider to enhance the effects of this procedure?

What kind of anesthesia is used?

What is your experience in performing this procedure? (How long has he/she performed this procedure, and how many he/she has performed in the past year?)

What percentage of patients has had significant complications? (The physician should disclose this information to you.)

Will you repeat or correct the procedure if it does not meet agreed upon goals? And if the procedure must be repeated/corrected, will I be charged again? (The physician should provide you with his/her policy on this issue.)

May I see testimonials or outcomes statistics of recent patients? The physician should provide many photos of recent patients.

May I have the names and contact information for several recent LASIK patients? (Follow up to get first-hand information on the procedure and the surgeon.)

Could I observe the exact procedure I am considering before I decide to have the surgery? (Either on videotape or ask to view one in real life.)

What should I expect post-operatively, in terms of soreness, what to watch for, medication, bathing, and level of activity?

Who will be assisting during the surgery? What are their qualifications? (Does the ophthalmologist perform the entire surgery?)

Have you ever had your malpractice insurance coverage denied, revoked, or suspended?

Do you offer patient financing?

**Be sure to:**

Tell your doctor about any allergies you have (to foods, drugs, environmental elements)

Tell your doctor if you have any serious medical condition(s).

Tell your doctor about all medications, herbal supplements or natural supplements you are taking (both prescription and non-prescription), including such natural remedies as Echinacea and St. John’s Wort.

Be sure to tell your doctor if you smoke. Smoking can lead to complications and poor healing.
Carefully follow any instructions your surgeon gives you regarding eating and drinking, smoking, and vitamins.

Avoid aspirin and aspirin-containing medicines for two weeks prior to surgery.

Arrange for someone to drive you home after surgery and help you for a few days afterward, if needed.