Hyperopia, or farsightedness, is the condition of the eye whereby the corneal curvature is too flat for the length of the eye, or the eye is too short for the corneal curvature. This results in light rays not yet coming to focus by the time they strike the retina in the back of the eye. A blurred, rather than sharp image of both distance and near objects is produced.

The excimer laser has been used throughout the world to successfully treat farsightedness up to +6.00 diopters using both surface PRK and the LASIK technique. Conventional and Wavefront hyperopic laser treatment is FDA approved.

From the patient’s perspective, the procedure for the treatment of farsightedness, using the excimer laser, with or without astigmatism is essentially the same as treatment of nearsightedness with or without astigmatism. However, rather than flattening the central cornea as is done with the treatment of nearsightedness, the peripheral cornea is flattened allowing the central cornea to become relatively steeper (please see Figure). The relatively steeper central cornea adds refracting power to the surface of the cornea allowing the light rays to focus closer to the central retina. This improves the distance vision of farsighted individuals, and if monovision is performed in one eye, may also help improve the reading vision in the monovision eye.

Because regression back towards hyperopia is slightly more common in the treatment of farsightedness than in nearsightedness, we purposely “overcorrect” patients in the early post-operative period. This means that we actually induce a small amount of myopia (nearsightedness) in both eyes during the early post-operative period. Therefore, the patient may be slightly nearsighted in one or both eyes for a few weeks to a few months after the laser surgery for farsightedness. Glasses for good distance vision may be required in the early post-operative period, and (depending upon the individual), the prescription may need to be changed a few times. Although this “induced” nearsightedness may be permanent and require surgical correction, in most cases, the early post-operative nearsightedness is temporary.

Because it is impossible to predict exactly who will be nearsighted post-laser and how long the nearsightedness post-laser will last, a farsighted individual undergoing laser refractive surgery must plan to wear glasses for distance (and possibly near) vision for the first few weeks to a few months post-operatively.

Whether an individual is farsighted, nearsighted, or has astigmatism, after any form of refractive surgery it is important to realize that glasses and possibly contacts may be required full-time following the laser procedure. The need for post-operative glasses or contact lenses depends on individual healing factors as well as the underlying degree of farsightedness, astigmatism, or nearsightedness that exists in your eye prior to the laser procedure.

**Expectations**

As with all surgery, there is no guarantee that you will attain your desired result with LASIK or any other type of refractive surgery. Although the success and satisfaction rate is extremely high, complications and/or side effects do occur in a small percentage of patients. You are considering these procedures because nature did not give you perfect vision. Similarly, surgeons, surgical equipment and procedures are not perfect. Thus, we cannot give you a perfect eye. Our goal is to give you a much improved eye, with better uncorrected vision (without glasses or contacts) than you are presently experiencing. We do not promise results, but we promise to do the best we possibly can. Following surgery, you must plan to wear distance glasses some of the time to fine tune your vision - especially for night driving. If you are over 40 and elect to not have monovision, then you will also need reading glasses.
**FDA Approval**

We have been performing LASIK since 1996, and as of the fall of 2007, Dr. Mandel had personally performed over 42,000 LASIK procedures. In November 1999, LASIK was fully approved by the FDA for myopia up to -14.00 diopters, astigmatism up to 5.00 diopters, and hyperopia up to +6.00 diopters. Hyperopia with astigmatism is also FDA approved, as is hyperopic wavefront correction. All of the lasers that we use are FDA approved.

**Combined Astigmatism Correction**

If astigmatism correction is deemed necessary, it will be performed by the laser at the time of the LASIK.

Astigmatism touch-ups (enhancement) may be performed either with the laser or with a small precision diamond surgical scalpel (astigmatic keratotomy - AK). In AK, two to four tiny peripheral corneal incisions are performed (less than one-fourth inch in length). Accuracy is quite good up to 2.50 diopters with either the laser or AK. Above this range, accuracy drops, especially with AK.

Both methods of astigmatism treatment are quick (less than three minutes) and performed with topical anesthetic drops. The most common side effect following AK is a foreign body sensation. AK results are observed quite soon, often showing effects within two to three days.

**Post-Operative Side Effects of LASIK**

◆ **Pain:**
During the procedure, both LASIK and surface EPI-LASIK, PRK/LASEK are essentially painless. Topical anesthetic drops provide excellent anesthesis. No injections are required. With LASIK, patients experience pressure when the suction ring is applied. This lasts for approximately 20 seconds. There is usually minimal post-operative pain following LASIK. Some initial soreness may occur due to the suction ring. A feeling of scratchiness, burning or stinging may be experienced the first night and will usually be gone by the following morning.

On the other hand, with surface PRK, LASEK or EPI-LASIK patients usually experience more discomfort than following LASIK. The therapeutic soft contact lens which is placed on the eye following PRK, LASEK or EPI-LASIK (but not LASIK) is effective in reducing discomfort. Most patients describe the discomfort as mild to moderate during this period. Some patients will have significant discomfort and some may have little or none. Oral medication is prescribed to diminish discomfort.

◆ **Light Sensitivity:**
Your eyes will be somewhat light sensitive and you may experience glare during the day and at night during the first few months.

◆ **Eye Coordination:**
As with all refractive procedures following surgery on one eye, there may initially be problems with coordination between the two eyes. Most patients undergoing LASIK will have the second surgery performed the same day. For patients having surface PRK, LASEK, EPI-LASIK or LASIK on one eye at a time, with the second eye weeks or months after the first eye, the patient will wear their contact lens in the non-operated eye to help with the coordination between the two eyes. If patients do not wear contact lenses, then in most instances, the spectacle lens for the operated eye can be removed or changed to clear glass and eyeglasses may be worn in the interim period between surgery for the two eyes.

Clearly, this is not an ideal situation which is why we prefer to perform surgery on the second eye fairly close to the first eye. Patients undergoing surface EPI-LASIK, PRK/LASEK usually wait a few weeks before undergoing surgery on the second eye.

◆ **Overcorrection:**
There can be a mild overcorrection initially after almost all refractive surgeries. This will usually diminish over the following weeks to months. A significant permanent overcorrection occurs in less than 3% of patients, and can be corrected with glasses or contact lenses or a laser “touch-up”.

◆ **Ghost Images and Double Vision from One Eye:**
This may occur following either LASIK or surface PRK, LASEK or EPI-LASIK. This is due to the surface of the cornea healing with a wavy configuration. This wavy surface can also give rise to distortion of images and a decrease in spectacle correctable vision. Many cases of surface waviness (irregular astigmatism) resolve within a year. However, if it does not, then these symptoms can be diminished by the use of a gas permeable contact lens. While the lens is in place, the distortion and ghost image will not be noticeable. However, when the lens is removed, the distortion and ghost images will reappear. A very small number of patients may be required to wear gas permeable contact lenses full time following the performance of either LASIK or surface PRK, LASEK or EPI-LASIK in order to achieve their very best vision.

◆ **Night Vision:**
Glare, halos, and starbursts around lights are very common initially following both LASIK and surface PRK, LASEK or EPI-LASIK. These symptoms may last 6-12 months. They generally diminish significantly.
by one year, but may persist. A decrease in night vision quality (contrast) may be noticed. Patients may require night driving glasses following refractive surgery. Having wavefront treatment may help to diminish the chance for these night symptoms.

- **Subconjunctival Hemorrhages:** Small broken vessels on the white of the eye due to the suction ring are common. They cause no problem and clear within two weeks.

- **Enhancement Procedures:** As with all refractive surgery, enhancements or touch-ups may be necessary following either LASIK, PRK, LASEK or EPI-LASIK. Enhancements may be requested due to regression, undercorrection, overcorrection or induced astigmatism. Occasionally, astigmatism will be created by the laser procedure where none existed pre-operatively. In most (but not all) cases, this induced (regular) astigmatism can be reduced with an astigmatic keratotomy or a laser touch-up procedure. The enhancement rate for hyperopia is approximately 15%. The rate is about 20-25% for patients with hyperopia and astigmatism.

- **Infection:** This can be a serious complication, but fortunately is extremely rare in all types of refractive surgery. Most can be treated effectively with antibiotics, but in the extremely rare case, the vision can be significantly reduced or the eye could be permanently lost.

- **Permanent Decrease in Vision:** The chance of reduced correctable (with glasses) vision (greater than 2 eye chart lines of vision) is 0.5-2.0%. It is highest in the myopic corrections above -7.00 diopters and hyperopic corrections above +4.00 diopters combined with astigmatism over 3.00 to 4.00 diopters. The chance of extreme or total loss of vision is exceedingly rare with either the surface procedures or LASIK. The potential causes are severe infections, flap trauma, optic nerve or blood vessel damage, bleeding in the central retina, retinal detachment, or scarring.

  All refractive surgery results in a decrease in contrast vision - the ability to discern subtle shades of gray. This is a qualitative measurement of vision. Clinically, some patients will notice a decrease in the quality of their night vision. Rarely is this a significant decrease.

- **Complications During the Operation:** These are uncommon, and include the following: Inability to seat the suction ring and/or inadequate suction, incomplete microkeratome pass, irregular cap (flap), tearing of the flap, or entrance into the interior of the eye. These may prevent us from performing LASIK or result in an inadequate flap requiring the procedure to be rescheduled in 3 to 6 months. This could result in astigmatism, inadequate correction and/or scarring with a permanent decrease in vision. Less common is creation of a free unhinged cap (which requires suturing back in place) or loss of the cap (very unusual). If the cap is lost, a partial or full-thickness corneal transplant would be required weeks to months following the cap loss. Vision without glasses or contacts is generally poor following these procedures. A few cases in many millions of procedures have resulted in blindness from disruption of the blood supply to the optic nerve or bleeding in the back of the eye.

  Possible laser-related complications include decentered ablation (the treatment area is decentered), or improper focus by the patient on the target device. These can cause undercorrections, overcorrections, and astigmatism, which could require additional surgical corrections (laser, astigmatic keratotomy) and quite possibly result in loss of best correctable visual acuity, glare and halos. However, most often, a decentered ablation cannot be corrected surgically and results in the need to wear a gas permeable contact lens.

- **Post-Operative Complications:** These are uncommon, and include: Material under the flap - usually of no consequence, but rarely may have to be rinsed from underneath the flap. Dropping of the upper eyelid, dislocated flap or folds in the flap, inflammation under the flap (DLK) requiring the frequent application of cortisone drops and rarely requiring lifting of the flap. Very rarely this inflammation results in central scarring (CTK) with a permanent reduction in vision and possibly the need for a contact lens for adequate vision. The flaps may need to be lifted and repositioned. Epithelial in-growth is growth of the corneal surface epithelial cells beneath the flap. This requires lifting the flap and removing the epithelium. Melting of the cornea from epithelial in-growth - rare but if occurs can be a serious problem. In-growth may require sutureing of the flap if it reoccurs. Infection as described above, corneal haze, significant overcorrection, and irregular astigmatism - all are rare with LASIK. Corneal haze from surface procedures was discussed earlier. There are other possible complications and side effects which are not mentioned because of their extreme rarity. Total loss of all vision in the eye is possible, but exceedingly rare!
1. The surgeon uses a precise instrument called a “microkeratome” to create a thin flap at the top of your cornea which is lifted away, but remains attached at one side.

2. The excimer laser, already programmed to your correction, removes a microscopic layer of cornea. This part of the procedure takes between a few seconds and approximately one minute, depending upon your degree of correction.

3. The corneal flap is put back into place and, because of its natural bonding properties, healing starts immediately. No stitches are required. Altogether, LASIK takes less than 5 minutes per eye.

As always, if you have any questions regarding your care, call us at:

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