



Issue 013

Is My Patient a Candidate for LASIK?

There are many people who can benefit from refractive surgery and with the advances in technology the demand for LASIK is increasing. Who can have it and who can't? Several factors are involved including the refractive error, corneal thickness, corneal curvature, overall ocular health, and motivation for surgery.

Refractive Error

First, what is the patient's refraction? For on-label use, the range is +6.00 to -12.00 D sphere and up to -6.00 D cylinder with a maximum -14.00 D spherical equivalent can be treated. We must also look at the best-corrected VA to see what the best possible result can be. Patients with amblyopia can be treated as long as the patient is aware that their vision will be no better than what they can achieve with corrective lenses. This even holds true for those with no binocularity but have an alternating exo- or esotropia. If the patient needs prism in their glasses, he/she needs to be aware that prism glasses would still be necessary to retain ocular comfort. On the other hand, if a strabismic patient has no diplopia in contact lenses, they will not have it after LASIK and will not need prism glasses. Of course, in the case of presbyopes, reading glasses will still be needed unless monovision is the goal. Monovision patients will likely need glasses for night time driving. Occasionally, patients elect to be undercorrected in both eyes. The undercorrection typically does not exceed -1.50D OU. These patients will need glasses for driving, but they won't need them for most indoor activities.

Corneal Thickness

New imaging technology is now being utilized to screen for ocular conditions that would make corneal surgery contraindicated. Pachymetry is a vital piece of the puzzle and can be determined using ultrasonic instruments, anterior segment OCT, or the Pentacam. Manual pachymetry is operator-dependant. OCT and Pentacam pachymetry is the most reproproducible. With OCT and Pentacam, we can also compare the superior to inferior corneal thickness and evaluate the progression of the corneal thickness from center to periphery. This allows for the most accurate patient screening to rule out even subtle corneal asymetry, such as keratoconus, for example.For LASIK, a corneal thickness greater than 500 microns is desirable. When it is less than 500, other options are explored such as PRK, ICLs phakic IOLs, or no surgery at all. For corneas above 500 microns, we have developed the software to calculate the residual stromal bed after LASIK. This software calculates the amount of stroma removed based on the patient's refractive error, adds the flap thickness, and subtracts these two values from the total corneal thickness. Flap thickness can, of course, be safely adjusted with the IntraLase.

Corneal Curvature

Standard placebo-disc corneal topography is performed to find unusual steepening, oblique astigmatism, or any other corneal irregularities. Keratoconus and other corneal thinning conditions are a contraindication for corneal surgery. With Pentacam, we can increase our sen-Continued with Candidate on page 2

LADARVision 6000: advanced excimer system

Recently, the excimer system was upgraded from LADARVision 4000 to LADARVision6000, ushering laser vision correction into the new era of ultra-fast ablations and precise outcomes. With the advanced system, the benefits to patients are remarkable.

LADARVision 6000 AutoRegistration Involves

Measuring (Wavefront)

Matching (Under Laser)

 Registering the ablation profile to the eye, correcting for cyclotorsion and translation

Figure 1. Accurate registration is the key component of accurate wavefront LASIK. Registration involves measuring the wavefront map (while the patient is supine) and then matching the map to the eye, correcting for cyclotorsion and translation (in a reclining patient). In LADARVision6000, this process is automated, eliminating possible operator error.



⁻ Registering the wavefront to the eye

LADARVision 6000 Upgrade	Benefit to patient
Increased speed of ablation	Increased comfort
- faster treatment time	 More predictable correction
- less corneal bed exposure	 Faster recovery of vision
Infrared lighting	Increased patient comfort
- better patient fixation	 Accurate wavefront correction
- better contrast provides accurate wavefront map registration to the corneal	
surface	
Auto-centration and Auto-registration (Figure 1)	Accurate wavefront correction
- removes possible observer bias	
- accurately matches wavefront image to the cornea treated under the laser	
Simultaneous wavefront image and eye display (Figure 2)	Accurate wavefront correction
- accurately matches wavefront image to the cornea treated under the laser	

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sitivity in detecting subtle keratoconus. Unlike standard topography, the Pentacam scans the posterior corneal surface in addition to the anterior. It also analyzes eight different indices of keratoconus. And the camera is peripheral so that the central cornea is directly measured, rather than estimated as in the standard topography and Orbscan.

By using both, the topographer and the Pentacam even the most subtle signs can be found. Using either one alone may not give the complete picture since each is sensitive to different corneal properties. Flat corneas around 40 diopters may also put a patient with a high refractive error at risk for higher order aberrations following surgery due to the resulting shape of the ablation. Many doctors have different opinions about how flat they are willing to go post-surgery. However, studies indicate that we should maintain residual corneal curvature greater than 35 diopters. Hyperopic ablations should stay below 50 diopters of corneal curvature.

Overall Ocular Health

The eyes are also checked for ocular conditions that may interfere with the results of LASIK such as cataracts and macular disease. Certain conditions must be resolved and stable such as central serous maculopathy and myopic shifts due to diabetes. Those being monitored for elevated IOP can have surgery. IOP should be checked before surgery and a new baseline IOP would be started a few weeks afterwards. Women should wait about 2 months following childbirth to guard against any vision changes due to the pregnancy. If in doubt, give the patient some time and re-evaluate later.

Factors that are NOT contraindications for LASIK

Well-controlled collagen vascular diseases, such as rheumatoid arthritis, for example, are not contraindications for LASIK. Two studies published in 2005 and 2006 analyzed patients with collagen vascular disease and found the results similar to healthy patients. We typically recommend working with the patient's rheumatologist and getting blood work done prior to LASIK to insure normal ESR (sedimentation rate). Often, we treat one eye at a time. HIV is not a contraindication as well. If the T helper count is low, we recommend treating one eye at a time. Patients with well-controlled diabetes can have LASIK, providing the prescription is stable (within 0.5D over a year). Breast-feeding is not a contraindication.

2007 calendar of the Upcoming Events for PVI Affiliated Doctors:

02/21/07:	Quarterly staff training. "All-Laser LASIK",
	Pacific Vision Institute.
03/23/07:	6th Annual San Francisco Cornea,
	Cataract, & Refractive Surgery
	Symposium. Ritz Carlton Hotel,
	San Francisco.
	Four hours of CE credit.



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