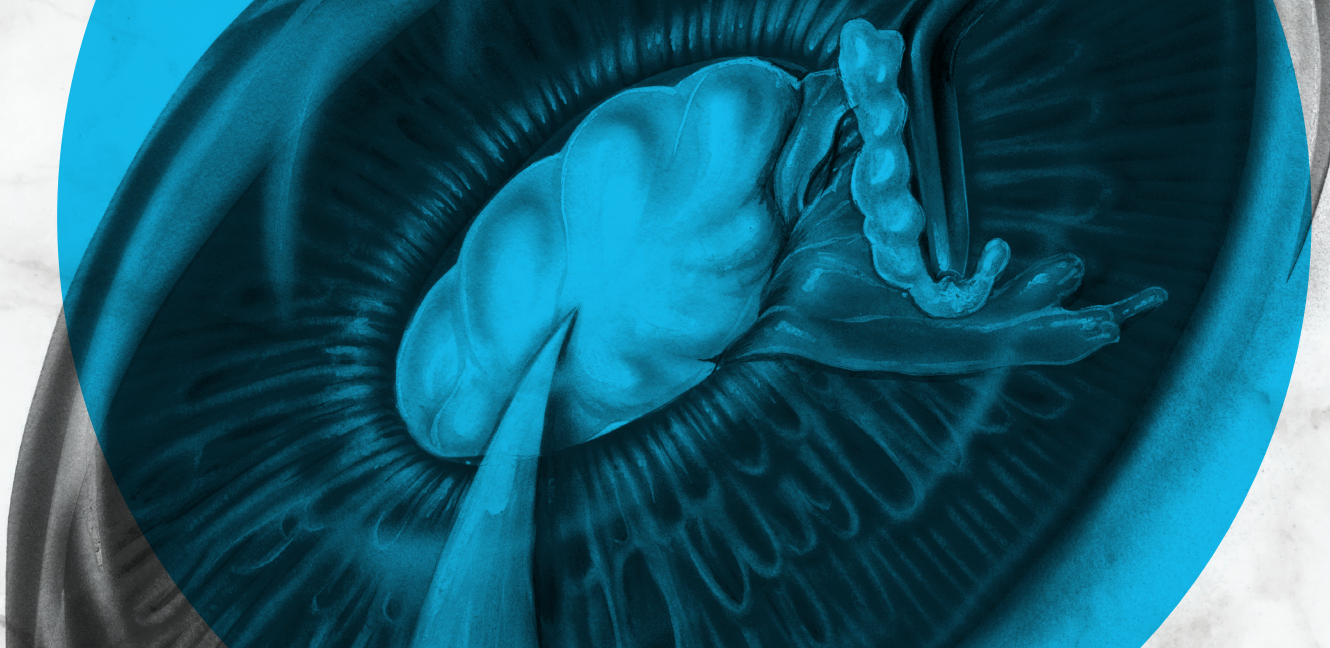




LASIK PRE- AND POSTOPERATIVE CARE PEARLS



Keep these in mind to help ensure the best visual prognosis.

BY MARGARET MOORE, OD, FAAO

This year marks the 25th anniversary of the FDA approval of LASIK, which has now been performed on an estimated 20 to 25 million eyes in the United States.¹ LASIK has revolutionized the ophthalmic surgeon's ability to provide elective surgical vision correction to a wide range of patients who, up until surgery, had spent their lives dependent on glasses or contact lenses to experience the world around them.

As with any surgical procedure, both preoperative and postoperative care of the patient is of utmost importance to ensure the best

possible visual outcomes and meet patient expectations. Although the patient satisfaction rate following LASIK is generally more than 95% (per a systematic review of 19 articles),² striving for satisfaction for every patient should always be the goal. The optometrist's role as a comanaging partner is essential in achieving this objective. Read on to see how.

PREOPERATIVE CANDIDATE SELECTION Emotional Considerations

Proper candidate selection based on motivation, expectations, and

attitude toward ophthalmic surgery is necessary for maximizing success in LASIK. If a patient wants to be entirely free from glasses and contact lenses at all distances for the rest of their lives, an upfront conversation should be had to set accurate expectations about LASIK's capabilities and limitations.

It is important for patients (and doctors) to remember that LASIK is only ever performed on healthy eyes and that the chance of complications from any surgical procedure is never zero. If a patient underwent LASIK and then developed halos in their night vision and chronic dry eye symptoms that they were not expecting, they may understandably be disappointed. Additionally, patients should understand that their vision may not be 20/20 in each eye (per a large review of 97 papers, 90.8% of LASIK patients achieved 20/20 or better, and 99.5% achieved 20/40 or better) and may shift slightly over time.³

Physical Considerations

ODs should consider the inclusion criteria (from a physical standpoint) that follows for undergoing LASIK before referring a patient for surgery.

Age. LASIK is FDA-approved for patients 18 years of age and older, but many surgeons prefer to hold off on surgery until patients are at least 21 years of age (or older, if their prescription has not yet stabilized).

Ocular/Systemic Health. LASIK is performed only on healthy eyes and in the absence of any systemic conditions that could potentially lead to degeneration of ocular health including, but not limited to, Sjögren syndrome, rheumatoid arthritis, and type 1 diabetes. Uncontrolled ocular surface dryness should also be viewed as a contraindication, as LASIK cuts corneal nerves that otherwise stimulate tear production.

Refractive Error. LASIK is performed only on eyes with refractive error that falls within certain parameters. Now that several different lasers are FDA-approved to perform LASIK, it should be noted that different lasers have different treatment ranges.⁴

Refractive Error Stability. A potential candidate must have a glasses prescription that is stable for at least 2 years to be considered for LASIK.⁴

Corneal Thickness. The patient should have sufficient corneal thickness to undergo LASIK so that enough healthy tissue is left over following the procedure (historically, 250 μm was the generally accepted minimum residual stromal bed, but at least 300 μm is now a more commonly accepted minimum to avoid post-surgical ectasia).⁵ The Munnerlyn formula serves as a guide to calculate ablation depth,⁶ but actual ablation depth and thresholds vary between laser types and surgeons.

Pupil Size. The larger a patient's pupils, the more likely the patient will have complaints of glare, haze, and halos when driving at night during the first 6 months following LASIK. However, per one study,⁷ these complaints were not correlated with pupil size after 6 months. Some patients report it taking up to 12 months for their nighttime glare and halos to become less noticeable.

Corneal Curvature. Having a steep or flat cornea is predictive of

LASIK COMPLICATIONS AND MANAGEMENT

When comanaging patients who have undergone LASIK surgery, be prepared to recognize and treat any of the complications below.

Traumatic Flap Dislocation

Drops and bandage contact lenses if minor and surgical repositioning if major dislocation¹

Neuropathic Pain

Autologous serum tears, oral gabapentin, oral naltrexone, and acupuncture¹

Transient Light-Sensitivity Syndrome

Topical corticosteroid therapy¹

Diffuse Lamellar Keratitis

Topical corticosteroid therapy, occasionally irrigation below the flap, and repositioning²

Interface Fluid Syndrome

Topical hypotensive therapy and topical steroid discontinuation³

Epithelial Ingrowth

Lift and scrape epithelial cells⁴

Ocular Surface Dryness

Artificial tears, topical cyclosporine/lifitegrast/perfluorohexyloctane, nutritional supplementation (omega-3), punctal occlusion, and thermal pulsation⁵

1. Stein R, Stein R. Clinical pearls in postoperative LASIK management. *Clin Refract Optom.* 2021;32(5):407-414.

2. Moshirfar M, Durnford KM, Lewis AL, et al. Five-year incidence, management, and visual outcomes of diffuse lamellar keratitis after femtosecond-assisted LASIK. *J Clin Med.* 2021;10(14):3067.

3. Randleman JB, Shah RD. LASIK interface complications: etiology, management, and outcomes. *J Refract Surg.* 2012;28:575-586.

4. Brennan K. Shutting the door on epithelial ingrowth. *Rev Ophthalmol.* June 12, 2018. Accessed July 11, 2024. www.reviewofophthalmology.com/article/shutting-the-door-on-epithelial-ingrowth

5. Donnenfeld E, Solomon K, Perry H, Ehrenhaus M, Solomon R, Biser S. The effect of hinge position on corneal sensation and dry eye after LASIK. *Ophthalmology.* 2003;110(5):1023-1029.

undercorrection⁸ and other potential postoperative visual complaints, especially in higher myopes. There is no consensus on keratometry cutoffs for LASIK, but patients with steeper or flatter corneas may be

better candidates for phakic IOL implantation or other alternatives.

Corneal Ectasia/Aberrations.

Screening for subclinical corneal ectasia and corneal aberrations should be strongly considered



AT A GLANCE

- As with any surgical procedure, caring for the patient before and after surgery—with regard to their expectations, physical attributes as they relate to their candidacy for surgery, and complications—is essential to ensuring the best possible visual outcomes and meeting patient expectations.
- For patients desiring to be completely free of glasses and contact lenses, it's important to have an upfront conversation with them to set accurate expectations about LASIK's capabilities and limitations.

when evaluating a patient for LASIK candidacy. LASIK increases higher-order aberrations in the cornea, such as spherical aberrations, which affect optical quality. If a patient has significant corneal aberrations or the beginnings of corneal ectasia prior to undergoing a refractive procedure, they are not an ideal candidate for LASIK.

Lifestyle/Occupation. Although it is not common for a LASIK flap to displace following surgery, it is a potential unique LASIK complication. For this reason, LASIK may not be an ideal choice (or even allowed) for certain professions; for example, LASIK has historically been a disqualifier for aviation, diving, and special forces roles in the military. LASIK alternatives performed without creation of a flap may be preferred.

POSTOPERATIVE CONSIDERATIONS Complications

Today's LASIK procedures are not the same as those performed decades ago, as femtosecond lasers have generally taken the place of microkeratome blades for corneal flap creation.⁹ The use of microkeratome blades carries a higher risk of complications during surgery due to variability in flap creation; flaps that

are incomplete, too thin, decentered, or irregular may necessitate reoperation within 3 to 6 months.⁹

Refractive surgeons report ocular surface dryness as the most common complication of LASIK, which can be treated like other cases of aqueous-deficient dry eye.¹⁰ Bearing this in mind, optometrists should be armed with a variety of treatment options to address any signs and symptoms that present. For a list of other postoperative complications and their management strategies, see *LASIK Complications and Management*.

Expectations

The postoperative period is a good time to review expected outcomes, side effects, and visual prognosis. Adverse reactions, such as glare, halos, and dryness, tend to be worse during the first 3 to 6 months following LASIK but generally taper off or reach a plateau by 1 year postoperatively. Presbyopic correction with glasses or contact lenses and possibly presbyopia-correcting drops will eventually be required for any LASIK patient who did not receive monovision correction.

Vision changes throughout life, and refractive shifts are possible. If applicable, any clinic policies

regarding future touchups to address refractive shifts should be reviewed by the surgeon—or the comanaging OD, if they are in same practice—during the postoperative period. Finally, patients should be told that they will develop cataracts down the road and will ultimately need another refractive surgery to correct this as well.

SUCCESS LIES IN COMANAGEMENT AND COMMUNICATION

The success of refractive surgery is heavily dependent on candidate selection, surgical equipment, and pre- and postoperative care and inherently relies on a strong optometrist-ophthalmologist comanagement relationship built on a foundation of good communication. Refractive surgery technology continues to evolve, and it is essential for both optometrists and ophthalmologists to stay updated on these new developments. ■

1. Joffe SN. The 25th anniversary of laser vision correction in the United States. *Clin Ophthalmol*. 2021;15:1163-1172.
2. Bamashmus MA, Hubaish K, Alawad M, Alakhlee H. Functional outcome and patient satisfaction after laser in situ keratomileusis for correction of myopia and myopic astigmatism. *Middle East Afr J Ophthalmol*. 2015;22(1):108-114.
3. Sandoval HP, Donnenfeld ED, Kohnen T, et al. Modern laser in situ keratomileusis outcomes. *J Cataract Refract Surg*. 2016;42(8):1224-1234.
4. Steinert RF, Koch DD, Lane SS, Stulting RD. LASIK surgery screening guidelines for patients. The American Society of Cataract and Refractive Surgery. Accessed June 5, 2024. [med.virginia.edu/ophthalmology/wp-content/uploads/sites/295/2018/01/LASIK-guidelines-for-patients.pdf](https://www.ascrs.org/ophthalmology/wp-content/uploads/sites/295/2018/01/LASIK-guidelines-for-patients.pdf)
5. Bunya VY, Madrigal PMG, Tripathy K, et al. Calculation for LASIK ablation. American Academy of Ophthalmology. February 13, 2024. Accessed June 5, 2024. [eyewiki.aao.org/Calculation_for_LASIK_Ablation](https://www.eyewiki.aao.org/Calculation_for_LASIK_Ablation)
6. Munnerlyn CR, Koons SJ, Marshall J. Photorefractive keratectomy: a technique for laser refractive surgery. *J Cataract Refract Surg*. 1988;14(1):46-52.
7. Schallhorn SC, Kaupp SE, Tanzer DJ, Tidwell JT, Laurent J, Bourque LB. Pupil size and quality of vision after LASIK. *Ophthalmology*. 2003;110(8):1606-1614.
8. Mostafa EM. Effect of flat cornea on visual outcome after LASIK. *J Ophthalmol*. 2015;2015:794854.
9. Stein R, Stein R. Clinical pearls in postoperative LASIK management. *Clin Refract Optom*. 2021;32(5):407-414.
10. Solomon KD, Holzer MP, Sandoval HP, et al. Refractive surgery survey 2001. *J Cataract Refract Surg*. 2002;28(2):346-355.

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