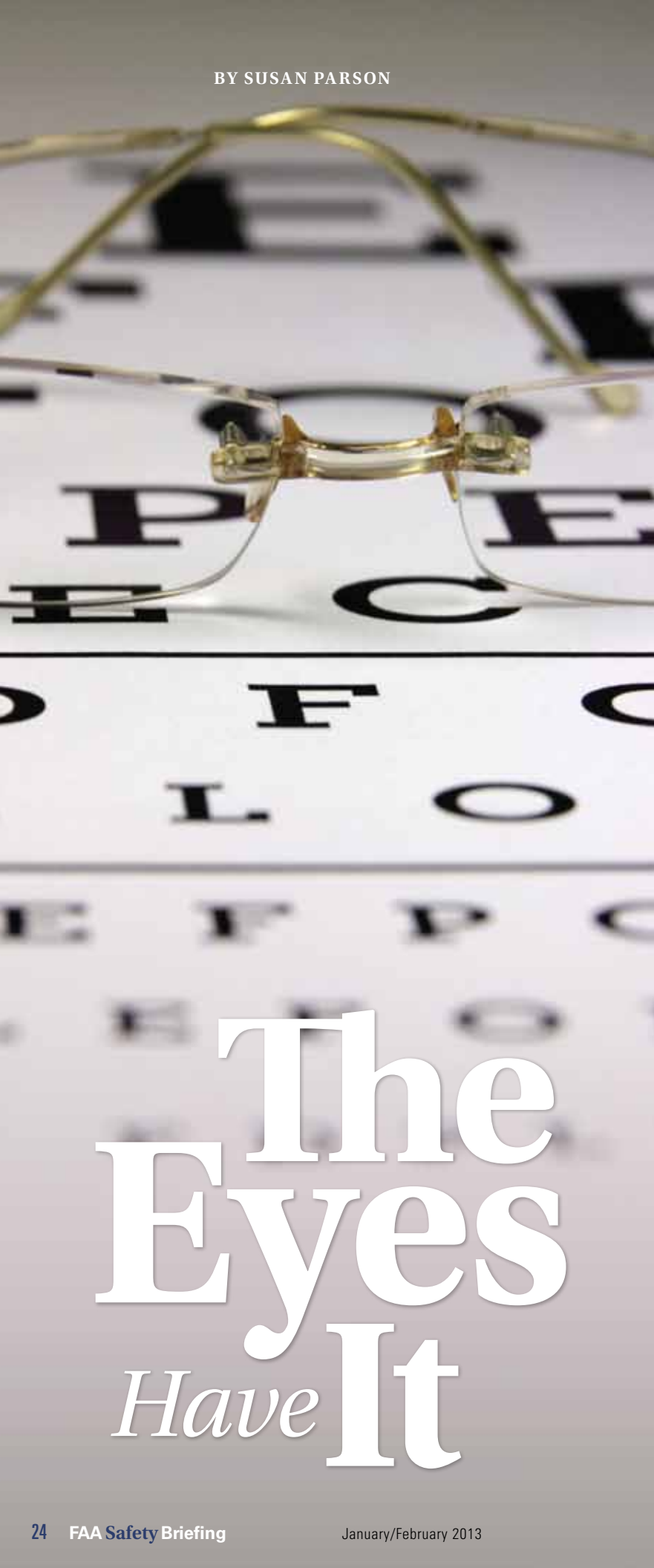


BY SUSAN PARSON



The Eyes Have It

When I woke up the morning after undergoing laser eye surgery, I was simply astonished by the transformation. Accustomed to the blurry view that had greeted me every morning since my early teens, the sharply-focused clarity was a most welcome surprise. Protective goggles prevented the mistake of rubbing my eyes in disbelief, but I blinked several times to be sure the new view was not some trick of my early-morning imagination.

Hindsight being 20/20, it's easy now to wonder why I waited so long. Plenty of my non-flying friends have asked that very question, but my pilot pals all understand the hesitation. As we all know, the FAA can (and does) certificate pilots with a wide range of physical limitations. Sight, however, is one of the few "no go" items for FAA medical certification. So I thought long and hard about a procedure that — as the eye doctor put it — is "very safe, but not risk free." And I did a lot of research, not only about the procedure itself, but also about the FAA's approval and reporting requirements.

Reflections on Refraction

A common cause of visual deficit is refractive error, which prevents light rays from being brought to a single focus on the retina. The three principal types of refractive conditions are myopia, hyperopia, and astigmatism.

- *Myopia* (nearsightedness) is a condition in which light rays are focused in front of the retina, which makes distant objects appear fuzzy. Myopia affects about 30 percent of Americans.
- *Hyperopia* (farsightedness) is a condition in which light rays are focused behind the retina, making near objects look fuzzy. An estimated 40 percent of Americans are hyperopic.
- *Astigmatism* is caused from an irregular curvature of the cornea, which prevents light from being focused to a single image on the retina. Astigmatism can cause blurred vision at any distance, and it can occur in addition to myopic or hyperopic conditions. Approximately 60 percent of the population has some degree of astigmatism.

Another cause of blurred near vision — one that I have reluctantly come to know in the past decade — is *presbyopia*. Presbyopia is a progressive loss of accommodation, which is a fancy way of saying that age-related physiological changes in the eye's crystalline lens and associated muscle reduce its ability to focus at near distance.

Optical Options

Until I summoned the courage to try laser eye surgery, I spent several decades using a combination of contacts and progressive lens glasses to correct for my particular blend of myopia, astigmatism, and, more recently, presbyopia. Increasingly annoyed by the hassle and discomfort of this approach and buoyed by the unbridled “you’ll love it” enthusiasm of several friends and colleagues, I decided it was time to look into (ahem) surgical alternatives.

One of the first things I learned is that there are a number of options for refractive surgical correction of vision. Some of the more common procedures are:

LASIK: For a number of reasons, including post-operative comfort, LASIK (laser in situ keratomileusis) has become the preferred choice for refractive surgery by patients and many eye care practitioners. To perform LASIK, the eye doctor uses two Food and Drug Administration (FDA) approved devices: the excimer laser to reshape the cornea and either the femtosecond laser or microkeratome to make the flap. A thin flap is cut from the outside layers of the superficial cornea, leaving it connected by a small hinge of tissue. The excimer laser reshapes the underlying corneal stroma (according to the optical needs and goals), and the corneal flap is returned to its original position.

Originally, LASIK involved creating the corneal flap with a mechanical microkeratome manipulated by the surgeon’s hand. The femtosecond laser keratome received FDA approval in December 1999 as the first blade-free technology in the United States for creating the corneal flap. The laser keratome beam passes into the cornea at a predetermined depth, producing a precise cut that may be more accurate than the microkeratome. Corneal flaps made with the laser keratome appear to adhere more tightly to the corneal bed at the end of the procedure, and may reduce problems with long-term flap displacement.

PRK: In October 1995, the FDA approved the use of the excimer laser to perform a refractive procedure called photorefractive keratectomy (PRK) to correct myopia, hyperopia, and astigmatism. As with LASIK, the laser photoablates (vaporizes) the corneal tissue to a predetermined depth and diameter by using a series of laser pulses. Some eye care providers still prefer surface ablation because the procedure is fairly close to LASIK, but without the risks of creating a flap. Healing does take longer however, since PRK creates a total corneal ablation.

ICL (Implantable Collamer Lenses): ICL is used for correction of refractive error primarily for individuals who are not good candidates for laser procedures (e.g., thin corneas, dry eye, or very high refractive error). ICL involves implanting an

intraocular lens over the natural lens of the eye. Dr. Harriet Lester, FAA Regional Flight Surgeon for the Eastern Region, colorfully describes this procedure as the “double-patty hamburger” approach.

Monovision: As a convenience, some eye care providers recommend correcting one eye for near vision and the other for distance. This option requires the individual to develop visual cues to reestablish depth perception.

Perfection Isn’t Possible (Yet)

Refractive eye surgery has come a long way, but it is still very important to recognize that these procedures involve both risks and tradeoffs. As Lester notes, “Today’s technology and techniques for refractive eye surgery are very sophisticated and allow for more customization to the optics of an individual eye as well as fewer errors. Still, you have to accept that any surgical procedure involves risks.” These can include not just immediate post-operative effects (e.g., irritation, light sensitivity), but also longer term effects (e.g., glare, “halos” or “starbursts”) that many people learn to ignore. There may also be some loss of contrast sensitivity.

Other possible risks include worsening of dry eye and ectasia, which is a progressive steepening or bulging of the cornea. As Lester explains, “LASIK can lead to ectasia in some individuals who are predisposed due to thin or abnormal corneas. That’s why pre-operative screening and counseling is so important.”

Lester also cautions middle-aged patients to be mindful that “refractive surgery runs into the timeline for developing cataracts. Procedures that modify the cornea may need to be revised after eventual cataract surgery — so keep that in mind in your decision-making process.”

As for tradeoffs, Lester observes that surgical correction of myopia changes the focal point from near to distant, which affects near vision clarity. I can attest to that. Though I knew to expect the switch, it was still strange to find that reading glasses were the price of correcting my formerly fuzzy distance vision. It wasn’t a big deal to me since I am at an age where readers rapidly become a requirement anyway. Still, it requires an adjustment.

To that end, Lester advises anyone considering refractive eye surgery to think of it in much the same way you might approach a marital commitment: “You have to make compromises, so make sure you can be happy with the ones you have to make. Remember that when you opt for refractive eye surgery, you are making a permanent change in your vision. Do as much research as you can, and don’t be afraid to ask lots of questions when you are discussing options with your eye care provider. You

also want to find a top-notch eye surgeon who is willing to say ‘no’ if you are not a good candidate for these procedures.”

Fit for Flight

Like any other aviator, I was eager to know how these procedures would impact FAA medical certification. Here’s the bottom line: The FAA allows most FDA-approved refractive procedures, including LASIK, PRK, and ICL for all classes of certification. The FAA accepts monovision after a six-month stabilization period and a successful medical flight test.

Now for the details.

The FAA requires that civil airmen with refractive surgical procedures (e.g., PRK, LASIK) discontinue flying until the eye care specialist has determined adequate healing, with stable vision and no significant adverse effects or complications.

The FAA allows most FDA-approved refractive procedures, including LASIK, PRK, and ICL for all classes of certification.

For most FAA-allowed refractive procedures, you may resume exercising privileges on your current medical certificate under 14 CFR section 61.53 as soon as your eye care

provider releases you to resume normal activities, and when your visual acuity meets the standard for the class of medical you hold.


The FAA does require your eye care provider to complete a report of eye evaluation (FAA Form 8500-7), which you need to present to your aviation medical examiner (AME) at the time of your next scheduled FAA medical examination. This report must verify complete healing, stabilization of visual acuity, no complications, and lack of significant residual effects that may accompany these types of surgical procedures (e.g., night glare, vision haziness, or eye discomfort). Sufficient healing typically occurs by six weeks, but up to a year or longer may be necessary in some cases. At the time of your next scheduled medical application, your AME may issue the appropriate medical certificate if you are found to be otherwise qualified. You may also submit this report directly to the FAA’s Office of Aerospace Medicine. In addition to including specific data on your condition, it should also state that:

(T)he airman meets the visual acuity standards and the report of eye evaluation indicates healing is complete, visual acuity remains stable, and the applicant does not suffer sequela, such as glare intolerance, halos, rings, impaired night vision, or any other complications.

There are a few more steps to take if you opt for monovision, since this procedure results in a monocular vision condition for purposes of FAA medical regulations. In other words, you do not meet the 14 CFR section 67.103, 67.203, and 67.303 requirements for near and distant vision with each eye separately. To regain medical certification after a surgical procedure, the FAA requires a six-month adaptation period. If you want to fly during this six-month interval, you must wear eyeglasses or contact lenses that correct you to meet the vision standard in each eye. Your medical certificate will state this limitation. (*Note: The FAA does not permit use of monovision contact lenses (wearing one lens to correct for distance and one to correct for near vision).*)

In order to have this limitation removed at the end of the minimum six-month adaptation period, you need to ask the FAA Aerospace Medical Certification Division to authorize a medical flight test with your local flight standards district office (FSDO). Successful completion of the medical flight test will result in the issuance of a Statement of Demonstrated Ability (SODA) that removes the corrective lens limitation from your certificate.

New Perspectives

There’s no question that I am now in the “I love laser eye correction” group. But I’d also be the first to stress that refractive eye surgery is not a decision that any pilot — especially a professional or aspiring professional pilot — should make without thorough consultation with a qualified eye care professional and serious consideration of the potential risks and inevitable tradeoffs. Although the FAA and most major air carriers allow laser refractive surgery, professional aviators must consider how it could affect their occupational and certification status. As with any invasive procedure, you should understand both the risks and the benefits before electing to go forward. But if you do ... enjoy the view! 

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Learn More

Information for Pilots Considering Laser Eye Surgery (Publication OK-06-148)

http://www.faa.gov/pilots/safety/pilotsafetybrochures/media/lasereye_ii.pdf