Advances in Refractive Surgery

New advances in refractive surgery technology have greatly improved the success of these popular procedures designed to reduce or eliminate your need for glasses or contact lenses.

Nearsightedness (myopia), farsightedness (hyperopia) and astigmatism can all be corrected by refractive surgery techniques. These vision problems arise when your eye's focusing system is either too weak or too strong; refractive surgery corrects your eye's focusing power system so you can see clearly without glasses or contacts.

The most commonly performed refractive surgery is LASIK. In LASIK, a corneal flap is cut from the front surface of your eye and gently folded out of the way while the excimer laser sculpts your corneal shape to correct your nearsightedness, after which the flap is repositioned and the procedure is complete. Traditionally, the flap is cut with a special blade instrument called a microkeratome. A new laser system—called a femtolaser—has been developed to create the corneal flap without using a blade at all. The femtolaser approach allows your doctor to create a more precise flap, giving him or her more control over the size, shape and thickness of the flap, all of which ultimately improve the quality of your vision after surgery.

Once the LASIK flap is made and folded out of the way, the excimer laser is used to reshape your cornea to do away with your refractive error.

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LASIK is highly successful, but some patients experience unwanted visual effects such as glare, halos, and reduced contrast sensitivity after surgery. These effects arise from higher order aberrations, which are complex and irregular refractive errors arising from your eye's focusing system. These higher order aberrations can now be measured using a technique called wavefront analysis. More importantly, when wavefront analysis is combined with the excimer laser, these higher order aberrations—and the visual problems that arise from them—can be corrected with LASIK. In this way, you can enjoy excellent vision after LASIK without the problems of glare, halos, and reduced contrast sensitivity.

Another refractive procedure growing in popularity is called refractive lens exchange (RLE). Both your cornea and your lens provide focusing power to your eye, and changing the focusing power of either one can change your eye's refractive state. In RLE, your natural lens is removed and replaced with a lens implant that has the right amount of focusing power to provide you with excellent vision without glasses or contact lenses. This is similar to cataract surgery, except that RLE is performed before cataracts develop in your lenses. One drawback to RLE is that traditional lens implants only have a single focusing power, and after RLE in both eyes, you can see well off at a distance but still require reading glasses to see up close. New multifocal lens implants have been developed that, once implanted, allow you to see clearly both at distance and near without the need for any glasses at all.

New technology is constantly providing improvements in refractive surgery techniques and outcomes. If you are considering refractive surgery, ask your doctor about these advanced refractive techniques.