

OPHTHALMOLOGY

Optical imperfections and how to tackle them

There are many such conditions, which can be treated surgically by modifying existing tissue or inserting different kinds of implants.



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Refractive errors prevent the eye from properly focusing light, causing blurred vision. They occur when the shape of the eye prevents light from focusing directly on the retina because of a longer or shorter eyeball, changes in the shape of the cornea, or ageing.

The most common types of refractive errors are myopia, hyperopia and astigmatism.

Myopia (nearsightedness): close objects appear clear while distant objects look blurry. Light focuses in front of the retina instead of on the retina.

Hyperopia (far-sightedness): distant objects are seen more clearly than near objects.

Astigmatism: the eye does not focus light evenly on the retina, the light-sensitive tissue at the back of the eye. This can cause images to appear blurry and stretched.

Correcting these problems

Refractive surgery aims to help patients gain spectacle independence and improve vision by correcting different refractive errors in different ways.

RE-SHAPING THE CORNEA

Cornea Laser Refractive Surgery This method aims to change the shape of the cornea permanently. This restores the focusing power of the eye by allowing light rays to focus precisely on the retina for improved vision. Among the procedures are:

- **LASIK (Laser-assisted in situ keratomileusis)** removes one flap of tissue from the cornea and creates another, using a blade or a laser. For the nearsighted, LASIK is used to flatten a cornea that is too

steep, while for the far-sighted, it can achieve a steeper cornea. LASIK can also correct astigmatism by shaping an irregular cornea into a more normal shape.

- **Photorefractive keratectomy (PRK)** uses the excimer laser in the same way as LASIK, but only the very top layer of the cornea is removed or moved aside before the laser sculpts the cornea.

- **LASEK, Epi-LASIK and ReLEx** are other PRK techniques that incorporate new approaches such as advanced surface ablation in which the cornea is cooled before or after surgery, which helps to reduce post-procedure discomfort. Another new approach is where a “bandage” soft contact lens is used to promote healing, which takes about four days.

- **SMILE (Small Incision Lenticule Extraction)** uses a femtosecond laser to create a disc, or lenticule, of tissue within the cornea, which is extracted through a keyhole incision (about 2.5-4mm).

IMPLANTING THE LENS

- **ICL (Implantable Contact or Collamer lens)** This type of intraocular lens is surgically implanted in front of eye's natural lens. Because the eye's natural lens is not removed, patients can retain their pre-existing ability to focus. The lens provides the necessary correction to redirect light rays precisely onto the retina. It can correct vision for eyes with high refractive errors and if the cornea is unsuitable for laser refractive surgery.



EXCHANGING THE LENS

- **RLE (Refractive Lens Exchange)** Similar to cataract surgery, the eye's natural lens is removed and an artificial lens is used to replace it. The type of replacement lens depends on the refractive error.

Which is my best bet?

Suitability of each treatment depends on age, cornea thickness, refractive error and lifestyle needs.

Refractive surgery reduces dependence on glasses or contact lens, but does not improve the eye's health. Myopic/short-sighted patients are more likely to suffer from blinding complications like retinal detachment, myopic macular degeneration, cataract and glaucoma.

Even if they have had LASIK and “gotten rid” of the myopia, the risk of these complications still remains. Patients must also understand that they may still need glasses or contact lenses after the procedure to achieve the best vision.

Like any surgery, there is risk of infection and inflammation, but the overall rate of such complications is low and the success rate is high at more than 90%. 