

## Health Promotion

### Refractive Surgery and Flying

There has been progressive development in the technique of reshaping corneas for improving vision in the past 20 years. In the past, ophthalmologists performed a procedure known as radial keratotomy (RK). As time passes by, the procedures are easier on both patient and ophthalmologists, as well as safer and more precise, with the use of more highly sophisticated technical equipment, such as lasers.

Briefly, the concept of refractive surgery involves changing the shape of the interface of the cornea and the outside air. When light traveling through air meets the curved surface of the cornea (water density), the shape of the cornea determines where in the back of your eyeball it will focus, relative to the length of your eyeball. For one with perfect vision, that point occurs on a small spot on the retina. Focusing is made by fine-tuning the lens that focus for the differences in distances of the object being viewed. Unfortunately, most of us have corneas that are not perfectly shaped. Some corneas are too flat, resulting in far-sightedness (hyperopia) while others are too pointy, causing near-sightedness (myopia).

Basically, there are two common offered refractive surgeries: photorefractive keratectomy (PRK) and laser assisted in situ keratomileusis (LASIK). The former involves literally vaporizing the outermost layer of corneal cells with a laser, the latter involves slicing a thin flap (but still attached by a hinge piece) off the central cornea and then reshaping the layer of cornea underneath with a laser. When the desired shape is obtained, the flap is placed back onto the cornea and allowed to heal in place. SMILE, as known as Small Incision Lenticule Extraction procedure, reshapes cornea and corrects vision in a minimally invasive way. It is an innovative technology which was approved for widespread use in the US in 2016. SMILE utilizes the Carl Zeiss VisuMax femtosecond laser system to alter the shape of the cornea to achieve vision correction.

One should be aware that in any surgical procedure, complications can happen to anyone. Minor complications may interfere with qualifying for a medical certificate of a pilot. Occasionally potential vision-threatening complications can occur, such as infection, development of haze in the vision, scarring, night glare, perforation of the eye, and prolonged post-operative steroid drop use which can result in cataracts or glaucoma. Problematic complications of LASIK include detachment or movement of the flap resulting in double vision, growth of corneal tissue into the flap, bleeding into the white part of the eye, and technical problems associated with the instruments. Common and temporary problems include mild irritation, dryness, sensitivity to bright lights, and tearing.

Refractive surgery is elective. One has to decide whether refractive surgery is right for oneself. It is an option of which the answer is very individualized for each and every pilot. One has to consider your health condition, your eye condition, the cost, the insurance coverage, whether the use of glasses or contacts presents a severe annoyance in the cockpit, whether the

uncorrected vision will likely produce a safety hazard that suddenly being without one's corrective lenses , the impact of sick leaves on a non-flying job or a flying related job, and the possibility that the complications may permanently interfere with ones careers, etc.

It is of paramount importance to choose an ophthalmologist, who performs a large number of such procedures for a long period of time with the best results in one's community. One can also talk with him whether one's health condition and eye condition render one a good candidate for the procedure. One may also wish to talk with former patients, and never hesitate to get second opinions from other ophthalmologists.