

Refractive Surgery

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Refractive surgery has undergone several advances over the past 15 years, beginning with the Russian technique, adapted from innovations of a Japanese ophthalmologist, known as Radial Keratotomy, and then to the use of laser removal of corneal tissue (photorefractive keratectomy), and now to experimental techniques that involve the use of plastic rings placed inside the cornea or of lenses implanted inside the eye. By far the most common refractive procedure performed today is photorefractive keratectomy (PRK). This may be done either with or without an incision being made in the cornea. For low degrees of nearsightedness, most ophthalmologists involved in refractive surgery today will choose to do the laser treatment without making an incision in the cornea. For high degrees of nearsightedness an incision is commonly made, creating a "flap" of cornea hinged at one side, which is folded back, with the laser treatment then applied to the inside portion of the cornea, and the flap then folded back over the area of treatment. The procedure of laser photorefractive keratectomy has undergone intense scrutiny in the North America, Europe, Asia, and South America. The results have been impressive, impressive enough, for example for the United States Food and Drug Administration to give approval to two laser manufacturers to market their lasers for the use in photorefractive keratectomy. The success rate, defined as visual acuity of at least 20/50 or better without glasses, has been quite high (85% or more in most centers), and complication rate has been extremely low. The main complication is the formation of excessive scar tissue or "haze" in the cornea. It is impossible to predict with certainty which patients might develop excessive haze, though we have the distinct impression that those patients who tend to develop dense scars in the skin after being cut, may be at higher risks of developing excessive haze in the cornea after PRK.

The procedure itself involves a preoperative evaluation to determine the amount of laser treatment which should be applied to achieve the desired correction so that the patient can see as well as possible without glasses, and then the application of the treatment itself on a separate visit. The treatment itself lasts approximately 30 seconds, though the details involved in actually getting positioned under the laser, getting the eye prepared for application of the treatment, getting medication in the eye afterwards, and having a soft contact lens or a patch applied to the eye make the visit on the day of treatment last approximately one hour. Postoperative pain is highly variable, patient-to-patient, but it typically controlled with analgesics.

Additional enhancements of the technique are now available for patients with moderate degrees of astigmatism in addition to their nearsightedness, and experimental lasers are in use now for studying the effectiveness of this same general strategy of PRK for treatment of farsightedness.