



# Corneal Laser Surgery

**LASIK** – “Laser **AS**sisted In-Situ Keratomileusis”

**PRK** – “Photo Refractive Keratectomy”

**SMILE** – “Small Incision Lenticle Extraction”

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## What is corneal laser surgery?

Along with the natural lens in the eye, a smooth and correctly-shaped cornea is critically important for clear and sharp vision.

Corneal laser surgery uses a highly accurate, computer controlled laser to permanently reshape the surface of the cornea which, in turn, corrects vision.

Three types of laser treatments are distinguished, namely LASIK, PRK and SMILE. The most important characteristics of each are outlined below.

**LASIK:** A delicate flap, approximately 120 microns (0.012mm) thick, is made on the surface of the cornea and folded to one side. The curvature of the exposed area is then reshaped with an Excimer laser, after which the flap is replaced in its original position. It re-attaches itself to the cornea over time.

To qualify for LASIK, the eye must be healthy and the cornea must be at least 470 microns (0.47mm) thick.

## Advantages and disadvantages of LASIK

- Both eyes may be treated during the same session.
- The procedure causes little discomfort.
- Visual recovery is fast and normal activities can be resumed within two to three days.
- Because a flap has to be made, the procedure is more expensive than other less complex methods such as PRK.
- Some patients may experience some dryness in their eyes for a limited time.

**PRK:** The surface layer of the cornea is carefully removed and the curvature of the exposed area is then permanently reshaped with the same Excimer laser. A “bandage” contact lens is placed on the cornea to protect it until the epithelial layer is restored (which takes on average about 72 hours).

To qualify for PRK, the cornea may be thinner compared to the criteria for LASIK. However, the eye has to be healthy in all other aspects.

## Advantages and disadvantages of PRK

- Because no flap is made, PRK is less expensive than LASIK, with the exact same final result after about 1 year.
- Because PRK is a surface treatment, the structure of the cornea generally remains more stable compared to LASIK.
- For the first couple of days, patients experience some discomfort in the treated eye (teariness, sensitivity, scratchiness and light-sensitivity). These symptoms clear once the epithelium has recovered, which takes approximately 72 hours.
- Since the new epithelial layer has to be smoothed by the continuous blinking of the eyelid, vision may only stabilize after 7 days to 3 months. In most cases functional vision returns within  $\pm 2$  weeks.
- Because visual recovery takes longer, it is advisable to treat only one eye at a time. Once the first eye recovers functional vision, the second eye may be treated.
- It is of utmost importance to follow the prescribed instructions and use the medication as directed.

**SMILE:** While a LASIK treatment is done under a flap and a PRK treatment on the surface of the cornea, a SMILE treatment corrects the shape of the cornea within the substance thereof.

A femtosecond laser is used to create a thin disc inside the cornea, similar to a contact lens (which is worn on the cornea). The shape and dimensions of this disc correspond exactly to the refractive correction that is required. The disc is then removed through a very small opening on the side of the cornea, thereby permanently correcting the curvature of the cornea.

SMILE combines the advantages of both LASIK and PRK in one procedure, but without the need for a flap. In addition, the surface of the cornea is not affected.

At the current state of technology, SMILE corrects myopia and/or astigmatism. The eye should also be healthy and a minimum thickness is also applicable.

### **Advantages and disadvantages of SMILE**

- Similar to LASIK and PRK, the treatment is performed under topical anaesthetic (drops).
- The procedure causes minimal (if any) discomfort.
- Visual recovery is quick and thus both eyes may be treated in the same session.
- It is possible to resume normal activities within two to three days after the treatment.

### **Before and during a laser treatment**

- A mild sedative is given to relax. Anaesthetic drops are then placed into the eye to numb the eye.
- The patient remains fully awake and may follow the process. Throughout the procedure, the doctor keeps the patient informed about what may be expected and how to respond and co-operate.
- While the treatment is underway, the patient is expected to focus on a green fixation light. The treatment itself usually takes less than 40 seconds.

### **Immediately after the treatment**

- Drops are placed in each treated eye and the eye is then covered with a hard shield. As far as possible, it is important to keep the eye closed behind the shield until the visit to the doctor the next morning.
- It is useful to arrange someone to assist with transport after the procedure.
- During the first night you may take a sleeping tablet to help you relax and get a good night's rest.
- When you visit the clinic for your follow-up appointment the next day, the hard shield is removed.

### **The first week and thereafter**

After your follow-up visit to the clinic, you will again be able to...

- Sleep without the eye shields.
- Drive, as soon as your vision attains 0.5 or better.

- Use make-up (if applicable).
- Participate in sport. If you had a LASIK treatment, you may only resume contact- and water sports after six months.

### **Important guidelines**

- Strictly adhere to the instructions and prescribed medication. It will help to prevent problems and accelerate the recovery of your eyes.
- Blink your eyes normally – do not close them forcefully.
- Sleep with the hard shields on your eyes for the first week. Use the Transpore tape to keep them in position – do not use anything else (like rubber bands).
- If your eyes feel scratchy or dry, you may use artificial tears, which can be obtained from most pharmacies.
- It is quite normal for your vision to fluctuate initially. This will stabilize within approximately 3 months.
- Do not rub your eyes.
- Do not expose your eyes to swimming pool-, shampoo- or soapy water for the first six weeks.
- You may clean your eye by gently wiping your eyelid with moist cotton wool vertically from top to bottom.
- Some patients may see halos around bright lights. This phenomenon usually clears within 3 months.
- If the initial refractive error is large, a further corrective adjustment may in some cases be required 3 to 6 months after the initial treatment.