



## 1. General information

Not long ago, the WHO - World Health Organization has described ametropia (medical term for diopter) as a category of disability creating a solution to the needs of many with ametropia who felt in that way. Large presence of ametropia, respectively imperfection of the eye, in the myopic form (nearsightedness), hyperopia (farsightedness) and astigmatism in general population as well as the need for better vision without glasses or contact lenses has increased the number of motivated patients to find a permanent solution in refractive surgery.

In order to have clear image, the light rays which penetrate into the eye must be bent in order to be focused precisely on the retina which is located in the inner part of the eye and it is much like the film in a camera. Retina transforms these light stimuli to nerve impulses sending them to the brain through the optic nerve. Light rays entering the eye are bent through two curved surfaces: **cornea and the lens**. The lens based on its resilience in youngsters can be swelled bending the light more thus focusing the rays on the retina and allowing the vision of nearby objects. In this way normal eye will enable a better near and distant vision. By aging of the lens, visual acuity of the near will reduce, therefore after the age of 45 the need for glasses appears. This is the farsighted for the elderly ages or presbyopia. On the other hand, if visual acuity of the distant objects is reduced and can be improved with the help of different optical tools (glasses, contact lenses), then we are dealing with refractive problem or **diopter**. This manifestation is due to the mismatch between the refractive apparatus of the eye and the length of eyeball – bulbus o'culi.

In short sightedness, the light rays bent through cornea and the lens fall in front of the retina, whereas in hypermetropia rays of light fall in the imaginary point behind the retina. In both cases the image of the object is unclear, and may be clarified by placing the divergent lens (nearsightedness) or convergent lens (farsightedness) in front of the eye. Astigmatism is refractory flaw which occurs due to the difference in the curvature of the cornea in different directions, which also results in unclear images of objects and can be corrected with cylindrical lenses.

Differences are small regarding corneal and lens refractive power. In most of the cases we have to do with the length of eyeball, being smaller or larger in comparison with the average length. If



the bulbus length is bigger, than nearsightedness occurs and in the opposite cases when it is smaller we have to deal with farsightedness. It is impossible to change the length of the eyeball; therefore refractory shortcomings can be improved through optical aids, but also through interventions in refractory apparatus of the eye: cornea and lens. Since the access to the lens is more difficult due to the fact that it is located inside the eye, access through cornea is preferred for refractive surgery, refractive strength of which is about 40 diopters.

## 2. Methods of surgery

LASIK (Laser in Situ Keratomileus) is a chosen method in many centers of the refractive surgery which with the help of excimer laser are corrected refractive flaws such as: nearsightedness, farsightedness and astigmatism.

Excimer laser creates cold beam which does not damage the surface tissue, while in contact with cornea, high energy photons disrupt molecular bonds in some levels. Thus small quantity of cornea tissue is removed and cornea curvature is eliminated. LASIK method corrects the vision by removing a fine layer of cornea using laser wave-beams which formerly with the use of microkeratome a membrane surface or flap is removed. By placing/folding the flap back to its original position it will heal after a few minutes excluding the use of sutures and bandages. Such combination of laser and microkeratome enables quick and comfortable rehabilitation.

Photorefractive keratectomy or PRK shapes the cornea with laser after mechanical removal of epithelium (surface layer of the cornea). Use of this method is suitable for small and medium myopias, hypermetropia and astigmatism up to 4D. It is also used in patients whose corneal thickness does not allow this procedure or it is not enough for LASIK procedure. Postoperative treatment with eye drops and therapeutic contact lenses is compulsory and lasts for a few months.

Astigmatic keratectomy (AK) is an outpatient surgical procedure to reduce or eliminate astigmatism. The corneal curvature of the patient is corrected which reduces or eliminates astigmatism or enables more comfortable wear of contact lenses respectively glasses.

LASEK is a modified form of PRK where instead of mechanical removal of the epithelium cells alcohol is used, in order to speed up the rehabilitation and reduction of subjective complaints. After the laser procedure in the deeper layers of the cornea epithelium cells will be back in place.



Postoperative treatment with eye drops and therapeutic contact lenses is the same as in PRK procedure.

Epi-LASIK is a modification of the mechanical removal of epithelium cells with a microkeratome and is the combination of the advantages of LASIK and PRK, which means faster rehabilitation after the intervention and less risk from ectasia (pathological swelling of cornea).

LASIK procedure is performed in 90% of cases.

### **3. Expectations**

Unrealistic expectations of refractive surgery are the most common reasons of patients' disappointment. This surgery is performed on voluntary basis nevertheless as in every other surgery to guarantee the result of 100% is impossible. Although this document provides you with extensive information regarding the refractive surgery, you are the one to decide whether to undertake this procedure or not, to remove/eliminate your refractive anomaly. LASIK surgery in 98-99% of cases derives without any complications. However, even if there are sometimes complications, most of them do not affect the vision acuity or have very little impact reducing it.

Surgical intervention and postoperative flow greatly depend on characteristics of each eye in particular; hence further information should be obtained with a certain reserve, general information, and not as specific.

Most often the surgery is performed in both eyes at once. In the first postoperative hours, there is a possibility that the patient experiences burning or itching and tearing in the operated eye, while the next day the sight will be back almost to normal. The full recovery is expected 4-6 weeks after the intervention. The patient will be able to work three days later.

In 90-95% of cases the sight will be back to normal without any need for correction. In some cases the reoperation is allowed after a few weeks. As small as the refractive anomaly is, the precision will be higher.



#### **4. Complications**

Complications are really rare (about 1%) and they are manifested with the increase of light sensations, haloes and reduced contrast of light. Some patients may feel dry eye which effectively can be eliminated by use of artificial tears.

During the creation of the flap with microkeratome, it may come to irregular or incomplete cutting of the flap due to the loss of vacuum, in which case further intervention will be stopped and postponed for three months.

Interlamellar contamination (e.g. blood of micropannus or blade micro fragments between the corneal layers) usually does not lead to reduced acuteness of the vision.

Forming of keratectasia and rare lamellar infection can be considered as serious complications which can be treated as any other corneal infection. Improper positioning of the flap can be manifested with only a few wrinkles in the cornea up to the torsion and need of using sutures. As a consequence of decentering of the ablation is the reflection, hyper and hypercorrection which can be eliminated by centering the main wave-beam of the laser before each intervention and checking the laser range throughout the surgery. Since here are mentioned some rare potential complications as well, their frequency corresponds to the number of complications that occur in patients who wear contact lenses.

#### **5. Remarks**

Presbyopia (aging eye) is an age-related eye condition that creates difficulties in near sight and occurs after the age of 40. In this case, the natural lens loses its elasticity whereas ciliary muscle which contracts the lens is weakened. As a result of all this age-related farsightedness or presbyopia occurs, namely the need for carrying eyeglasses while reading or working in close range.

Given the fact that intervention with excimer laser corrects the distant sight, the laser cannot intervene with the normal process of aging. Therefore if you carry reading glasses, bifocal or multifocal, the near sight correction will still be needed even after the intervention with excimer laser. Some special methods (e.g. mono vision or hyper asphericity) utilize the brain's ability to mitigate the dependence on reading glasses after refractive surgery with excimer laser.



Information and consent for patients preparing for refractive surgery  
LASIK  
Laser Eye Center Kubati

Patients not reached the age of presbyopia will have a need to carry reading glasses after the age of 40, just as it occurs among people who have never carried glasses in their lives.

Although Laser Vision Correction method is generally widespread and successful, there are serious complications in a very small percentage (less than 1%).

- 1. I am informed on the benefits and possible complications as well as possibility of eliminating complications.**
- 2. I declare that I have asked all the questions I wanted to ask and I have received satisfactory answers.**
- 3. I knowingly and will full confidence agree to undertake this surgical intervention, vision correction with laser-LASIK.**

PATIENT'S NAME AND SURNAME

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Date:

Patient's signature:

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Detailed information can be found in the below listed websites:

<http://www.alcon.com/en/alcon-products/surgical.asp>

[www.kubati.net](http://www.kubati.net)