Standard for diagnosis and treatment: Adult cataracts

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Rationale of standard

Despite all efforts to reduce the proportion of cataracts amongst other causes of visual disorders worldwide, cataracts remain the main cause of blindness. Only in the most economically advanced countries is it possible to ensure treatment for all who require it. Epidemiological studies monitoring the causes of visual disorders contain certain distortions, because patients with a cataract may have other visual disorders, such as e.g. degenerations of the retina, which contribute to a resulting impairment of sharpness of vision. As a result it is necessary to devote sufficient attention to ensuring that the categories of the leading causes of visual disorders in the given individual are correctly determined. At present, under greater scrutiny than the actual numbers of persons with an advanced cataract is the degree of ensuring surgical treatment of cataracts, which is an indirect indicator of the degree of sight defect. In order to fundamentally limit the proportion of cataracts amongst the causes of blindness in a given geographical region, it is necessary to perform at least three thousand operations per million inhabitants in a single calendar year. This number is reached and exceeded only by the economically most advanced countries in the world.

In most countries the number is lower, and in a range of these countries does not even reach one third of the required amount.

The annual incidence of blindness caused by cataracts is exceptionally high, and many patients who could have been helped by such an operation do not receive it. Because cataracts occur at a more advanced age and life expectancy with a bilateral cataract causing blindness is not long, the number of living persons in this category is only a fraction of the actual number of those in whom the cataract is not yet causing blindness but markedly affecting their sight and socio-economic independence.

A cataract operation is relatively financially demanding, primarily due to the expensive surgical equipment necessary for the diagnosis and operation. From the perspective of society, cataract surgery is financially demanding mainly because it is a very frequent operation. With the expected ageing of the population, it is necessary to reckon with a further increase of this financial burden. The "cost effectiveness" of a cataract operation, however, is favourable in comparison with other operations such as hip replacement or fitting of a pacemaker (ICD). The endeavour to reduce payments for cataract operations leads to a deterioration in the quality of care and subsequent higher occurrence of complications which themselves are financially demanding, with the result that the burden for taxpayers is actually increased as a consequence of to endeavours to reduce costs for cataract operations. The introduction of limits on operations with an extended waiting time for the operation may also be disadvantageous, because for example the number of injuries and traffic accidents increases due to unresolved visual malfunctions.

Method of verification of care according to standard

To date no practical verification is performed in common practice. As the first step it is possible to observe the occurrence of postoperative complications. Because professional specialists at present do not have any competence to draw any conclusions from the potential monitoring of quality indicators, thus for example postoperative complications, the method of verification of care shall be within the competence of the health insurance payer.

Recommended period of effectiveness of standard

Two years

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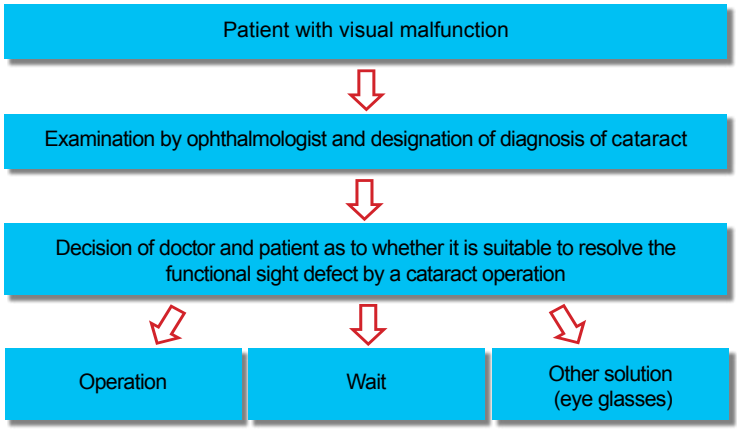
DESCRIPTION OF STANDARD

Developmental diagram of care process



Professional and clinical delineation of standards

Fields to which standard relates

Ophthalmology

Areas of care to which standard relates

- Healthcare
- Other
- Care of general practitioners
- Care of outpatient specialists
- One-day surgical care

Group of patients

Cataracts have the greatest prevalence amongst the eye disorders which cause impaired vision and blindness. Worldwide, out of 30-45 million cases of blindness, 45% are caused by cataracts. The prevalence of cataracts fluctuates widely depending on the local conditions, increases with age, and is higher in women. The prevalence of cataracts in persons aged between 65 and 74 years is 50%, in persons older than 75% it increases to 70%. In our population approximately 7% of patients per year are currently indicated for cataract surgery (*table 1).

***Table 1**

Code	Name
H250	Senile incipient cataract
H251	Senile nuclear cataract
H252	Senile hypermature cataract
H258	Other senile cataract
H261	Traumatic cataract
H262	Complicated cataract
H263	Drug-induced cataract
H280	Diabetic cataract
H281	Cataract in other endocrine, nutritional and metabolic diseases
H282	Cataract in case of other disorders not classified elsewhere

**According to valid version*

Critical procedures, code and name, critical material, code and name (*Table 2)

***Table 2**

Code	Name
75345	Extracapsular extraction of lens (cataract)
75347	Implantation of intraocular lens – PMMA (Polymethylmethacrylate)
75348	Implantation of intraocular lens – soft (foldable) monofocal, spherical lens
75349	Fixation of intraocular lens
75355	Secondary implantation of intraocular lens
75427	Phacoemulsification
75429	Intracapsular extraction of lens (cataract)

**According to valid version*

Negative clinical delineation, code and name

Cataract in childhood, congenital cataract

Key terms

Eye, Cataract, Surgery, Pseudophakia, Lens

Qualification and technical requirements of provider

Qualifications of institution of provider and departments thereof
Diagnosis of the disorder is performed by an ophthalmologist.
Indication for a cataract operation is determined only by an ophthalmologist.
The cataract operation is performed by an ophthalmologist with ophthalmo-microsurgical skill and an assistant (ophthalmologist or accredited nurse).
Postoperative care and suitable treatment is performed only by an ophthalmologist.

Technical requirements
Diagnosis: slit lamp, optotypes, box of refractive error corrected glases, ophthalmosocope, tonometer.
Indications for operation: slit lamp, optotypes, box of refractive error corrected glases, ophthalmoscope, ultrasound B.
Cataract operation: slit lamp, ultrasound A scan, noncontact biometer – not mandatory, keratometer, operating theatre with standard hygiene requirements, operating microscope with coaxial illumination, phaco machine, microinstruments, suitable medicaments.
Postoperative care and supplementary treatment: slit lamp, optotypes, box of refractive error corrected glases, ophthalmoscope, tonometer.

***Table 3**

Order	Recommendation	Strength of recommendation
1	Diagnosis of cataract is performed by qualified ophthalmologist. Essential equipment for diagnosis includes a slit lamp, optotypes, I box of refractive error corrected glases, ophthalmoscope and tonometer B	D
2	Indication for surgery is determined by ophthalmologist with attestation. Essential equipment for indication includes a slit lamp, optotypes, box of refractive error corrected glases, ophthalmoscope, ultrasound	D
3	Cataract operation performed by ophthalmologist with ophthalmo-microsurgical skill. Essential equipment for surgery includes a slit lamp, ultrasound A scan, noncontact biometer, operating theatre with standard hygiene requirements, operating microscope with coaxial illumination, phaco machine, microinstruments, suitable medicaments	D

Personnel qualification requirements

Diagnosis of the disorder is performed by an ophthalmologist.
Indication for a cataract operation is determined only by an ophthalmologist.
The cataract operation is performed by an ophthalmologist with ophthalmo-microsurgical skill and an assistant (ophthalmologist or accredited nurse).
Postoperative care and suitable treatment is performed only by an ophthalmologist.

SUMMARY OF RECOMMENDATIONS FOR QUALIFICATION AND TECHNICAL REQUIREMENTS SECTION

***Table 3**

Description of illness and process of care

Delineation of illness

Definition of disorder
A cataract is any opacity in the lens which causes its less transparency and dispersion of transmitted light.
Pathophysiology
The pathogenesis of a cataract is multifactorial. Pathophysiological process include dysregulation of the metabolism, which is manifested in the lens by an increased water content, aggregation of proteins with a high molecular mass and subsequent formation of vacuoles. Biochemically it leads above all to a malfunction of the glucose mechanism and oxidation stress, with the occurrence of free radicals. In an environment with a high glucose concentration, a malfunction of certain proteins and a reduction of the important antioxidant agent glutathione occurs. Oxidation stress causes damage to the cell membranes (peroxidation of lipids), also polymerisation of

proteins and malfunction of enzymes. The above-described processes cause a change in the transparency of the lens and the formation of vacuoles, which contain degraded proteins. This process leads to opacity of the optical environment of the lens and a deterioration of the quality of the image on the retina, with concurrent deterioration of visual functions of various degrees.

Risks and causes of disorders

The development of all types of cataracts is variable, unforeseeable, and in a certain manner connects to type. Any part of the lens may become opaque. With increasing age, the thickness of the lens increases. Constant production of lens fibres causes hardening and thickening of the nucleus, entitled nuclear sclerosis. There follows a change and aggregation of lens proteins and their yellowish--brown discoloration, with a change in transparency and the refractive index of the lens. Nuclear sclerosis and yellowing are considered a normal part of the ageing process.

Risk factors which may lead to the formation of cataract include the ageing process of the lens other eye diseases (retinitis pigmentosa, uveitis), previous eye surgery (trabeculectomy, amotio retinae, pars plana vitrectomy), refractive error (primarily high myopia), UV-B and infrared radiation, ionising and X--ray radiation, general metabolic and skin disorders, local and general use of various types of drugs, mechanical and chemical traumas, electric shock injuries. Smoking demonstrably causes the occurrence of posterior and nuclear cataracts. Another possible cause is alcoholism, as well as severe dehydration e.g. as a result of acute diarrhoea.

A risk factor in the occurrence of cataract may be various harmful effects acting during the intrauterine development of the foetus (drugs, ionising radiation, infectious and other illnesses in the pregnant woman), as well as a whole range of hereditary disorders and syndromes with the occurrence of hereditary forms of stationary and progressive cataract. In some cases the onset of progression may not appear until adulthood.

Classification of disorders

According to etiology and clinical finding

1. Uncomplicated senile cataract
2. Complicated cataract
3. Traumatic cataract
4. Drug-induced cataract
5. Radiation cataract
6. Metabolic cataract
7. According to affected localisation
8. Subcapsular
9. Cortical
10. Nuclear
11. Combined.

Epidemiology of disorder

Cataracts are the most numerous amongst the eye disorders which cause decreased vision to practical blindness worldwide. Out of 30-45 million cases of blindness, 45% are caused by cataracts. The prevalence of cataracts fluctuates widely depending on the local conditions, increases with age. The prevalence of cataracts in persons aged between 65 and 74 years is 50%, in persons older than 75% it increases to 70%.

Incidence and costs for care

The amount of costs spent on the purchase of modern technology are compensated for by greater safety of the intervention, faster healing and a reduction of the time of patient´s disability to work. This is enabled by minimising the surgical incision and more rapid renewal of visual functions following modern cataract surgery with implantation of new types of IOL. The total sum of costs for new, more modern and safer methods of operation is far greater than the sum of costs for older methods of operation.

Examples of new features:

- Small incision
- Outpatient procedure
- Types of intraocular lenses (at present, in addition to standard monofocal spherical lenses, lenses exist e.g. for the correction of astigmatism = toric lenses; lenses replacing reading glasses – multifocal and accommodating lenses). These are referred to generally in the Anglo-Saxon literature as premium intraocular lenses.

Characteristics of initial status and conditions for beginning of care

Anamnesis and clinical image upon commencement of care

Anamnesis

Decrease of sharpness of vision (more important than the result on Shellen's optotypes is whether the visual dysfunction affects the patient in his/her regular activities), glare (deterioration of vision caused by light dispersion), reduction of contrast sensitivity, myopisation of the eye, monocular diplopia.

Clinical picture

Qualitative and quantitative changes in visual functions caused by cataracts depend on the localisation and degree of opacity of the lens. According to the localisation of the disorders, it is possible to divide lens cataracts further into subcapsular, cortical and nuclear. Their mutual combination is very frequent. A subcapsular cataract, predominantly posterior, begins on the posterior pole of the lens and extends centrifugally in the direction of the equator. Decrease of visual functions is frequent, and mainly in the initial stages is most pronounced in the case of strong lighting, when the pupil contracts. A cortical cataract begins mostly at the equator and spreads, often irregularly, to the centre of the lens. From the beginning it may not significantly affect visual functions. Advanced cortical cataract may absorb an increased amount of water and increase the volume – an intumescent cataract forms. Resorption of water may be reduced by the volume of the cortex and the dark nucleus droped down – a hypermature cataract forms.

A nuclear cataract may develop over a very long time, the nucleus of the lens darkens and gradual myopisation of the eye occurs, frequently with impairments

***Tab. 4.**

Order	Recommendation	Level
1	Adults aged over 18	4
2	Patients with examination diagnosted cataract, who have subjective functional impairment of visual functions negatively affecting the patient's requirements	4
3	Patients with examination diagnosted cataract. Also patients who have disorders of the posterior segment, the therapy or examination of which is impossible by the presence of the cataract	4
4	Patients with clinically significant cataract and clinically significant anisometropia	4
5	Patients in whom the lens is the cause of inflammation (phacolysis, phacoanaphylaxis)	4
6	Patients in whom the lens causes closure of the chamber angle	4

of colour perception. In a very advanced state, the nucleus becomes more opaque to brown – brunescent cataract, or red – cataracta rubra to black – cataracta nigra.

Prevention of occurrence of disorder
This is based on eliminating the observed risks (UV radiation, nicotine addiction, alcoholism, malnutrition, severe long-term dehydration etc.).

Summary of recommendations for initial criteria of standard

***Table 4**

Actual process of care

Diagnostics and differential diagnostics
Diagnosis of a cataract can be stipulated on the basis of a precize ophthalmological examination, in which it is necessary to take into account the patient's overall condition of health and any other applicable illnesses. The basic examination upon stipulating the diagnosis of a cataract covers:

1. Determination of anamnesis
2. Designation of sharpness of far and near vision, without correction and with optimal correction
3. Examination of ocular adnexas
4. Measurement of intraocular pressure by tonometer
5. Biomicrosopy of the eye on slit lamp in mydriasis
6. Direct or indirect ophthalmoscopy of posterior segment
7. Calculation of power of intraocular lens on the basis of keratometry and biometry of the eye by UZ biometry or noncontact infra biometry using calculation formulas /SRK II ,SRK-T, Hoffer-Q, Holladay, Haigis/
8. Examination of vitreous area and retina by ultrasound-B in case of total opacity of the lens and impossibility of ophthalmoscopic examination.

Specific tests, e.g. determination of contrast sensitivity, corneal topography, endothelial microscopy, OCT can be used in indicated cases.

Basic treatment
Treatment of a cataract is only surgical. The primary indication for a cataract operation is decreased visual functions of the eye and subjective complaints of the patient as a consequence of a cataract of the lens, which has a detrimental effect on the patient's quality of life. A further indication is anisometropia, impossibility of optimal examination or treatment such as photocoagulation of the retina, pars plana vitrectomy, closure of the anterior chamber angle caused by lens, phacoanaphylactic uveitis, phacolytic glaucoma, luxation of the clear lens into the anteriorl chamber, luxation-subluxation of the clear lens into the vitreous.
A contraindication for cataract operation is a condition in which there is no hope of the improving visual functions. A relative contraindication is an unsatisfactory general condition of health of the patient. Preoperative visual acuity need not be an objective indicator of the condition of preoperative functions of the eye, and as a result indication for a cataract operation should not take place only on the basis of this examination.
The patient must be sufficiently and comprehensibly informed about the technique of the cataract operation and the potential operative and postoperative complications by trained personnel. The patient shall confirm consent by signing a special form (Informed Consent).
The patient should also be informed of other modern possibilities for cataract surgery, e.g. new technologies of intraocular lenses, cataract operations by femtolaser, which are not a component of the standard cataract operation.
Patients can limit the risk of occurrence or progression of a cataract by changing their exposure to risk factors. Smokers should be informed about the increased risk of occurrence and progression of a cataract and the benefit of stopping smoking in order to slow the progression of the cataract. Patients who are long-term users of peroral or inhaled corticosteroids should be informed of the increased risk of the occurrence of a cataract. Patients with diabetes should be informed of the increased risk of the occurrence of a cataract.

Biometry and calculation of dioptric strength of intraocular lens
Attaining the planned postoperative refraction of the operated eye requires preoperative measurement of biometry, with the help of which the correct power of the artificial intraocular lens to be implanted in the patient's eye is determined. The measured values of the axial length of the eye in mm, the average value of the curvature of the cornea in the dioptres and the specific constant of the intraocular lens stated by the manufacturer are attained by ultrasound or laser ray into special formulas. There are also more complex formulas which include further biometric values and the "individual constant" of each surgeon (which is calculated retrospectively from the refraction of patients already operated on) in the calculation.

Anaesthesia
Cataract operation is performed predominantly under local anaesthesia, in exceptional cases under general anaesthesia. Typical local anaesthesia: retrobulbar, parabulbar, periocular, sub-conjunctive, sub-tenon, topical and intracameral. Local anaesthesia may be combined with analgosedation. In the majority of patients, the operation may be performed only under local anaesthesia with an endeavour to minimise the invasive administration of the anaesthetic. The optimum anaesthesia strategy and its suitable type is selected by the surgeon on the basis of the requirements and preferences of the patient. The operated patient must be informed of the method of anaesthesia before the procedure. The presence of an anaesthesiologist or internal specialist during the operation is beneficial, but not essential for the majority of patients.

Surgical technique
According to the present state of science, removal of the nucleus of the lens and lens materials whilst preserving the fundamental part of the capsular bag (capsule of the lens) with implantation of an artificial intraocular lens into the capsular bag is considered the most efficient lege artis cataract operation. The technique of ultrasonic phacoemulsification with a minimal operation incision of 1.8-3.2 mm, opening of the anterior capsule of the lens (circular capsulorhexis), with the use of quality OVD – viscoelastic material for the protection of the intraocular structures, and with implantation of a biocompatible intraocular lens, as a rule without the use of suture, most probably corresponds to this principle. The operating technique may be modified according to the individual intraocular finding. In indicated cases (extremely hard black lenses) it is possible to use also an older, extracapsular technique with an incision of 8-10 mm, or intracapsular extraction with an incision of 10-12 mm in the case of a subluxated lens or dehiscence of the zonular apparatus.

Intraocular lenses
Implantation of an intraocular lens serves for the correction of an optical defect brought about by a cataract operation. At present the standard is one-piece or multi-piece, monofocal, soft (foldable,) square edge lens, produced from acrylates or silicon with a UV filter, which are implanted into the lens capsule. Their great advantage is the possibility of implantation with a small incision using special insertion systems, which ensure the minimum contact of the instruments and the surgeon with the artificial lens before its implantation into the eye. This con-

siderably reduces the risk of postoperative infection and potential damage to the lens during handling, and radically reduces the time necessary for rehabilitation of the patient.

Complications of cataract surgery

Complications of cataract operation leading to a loss of vision are rare. Amongst the most frequent peroperative complications are rupture of the posterior capsule with or without prolapse of the vitreous body, bleeding into the anterior chamber, suprachoroidal haemorrhage, a shallow anterior chamber and damage to the iris. In early postoperative complications we may encounter a transitory increase in intraocular pressure, oedema and striata of the cornea, inflammation of the anterior segment, bleeding and residues of the lens material in the eye. A potential postoperative risk is infectious endophthalmititis, suprachoroidal bleeding, cystoid macular oedema, detachment of the retina and oedema of the cornea with subsequent bullous keratopathy.

Amongst the complications relating to the intraocular lens are incorrect dioptric power of the implanted intraocular lens, its decentration or dislocation, glare, glistening, calcium deposits and pseudophakic dysphotopsia. All of the above-stated conditions may be the reason for replacement of the intraocular lens.

In addition to the above-stated postoperative complications, gradual opacification of the posterior capsule of the lens may occur. This concerns a "secondary cataract", which has 2 basic forms: proliferative and fibrotic. Both types may reduce the patient's vision at various times after the operation of the cataract. This occurs in up to 50% of operated eyes, partially depending upon the type of implanted intraocular lens. In general intraocular lenses from PMMA and hydrophilic material have a higher occurrence in comparison with lenses made of silicon and hydrophobic acrylates. Treatment of the aforementioned secondary cataract, depending on the individual finding and preference of the surgeon, resides either more frequently in the performance of a fenester in the posterior capsule using an NdYAG laser, or surgical discision or excision of part of the posterior capsule.

Summary of recommendations for care process section

***Table 5**

Outcome of care process

Aim of treatment

The aim of the treatment is to improve the visual functions of the patient.

Prognosis

This depends on the preoperative condition of the other optical media of the eye, the quality of the zonular apparatus of the lens, the function of the individual sections of the optic pathway, type and course of operation and postoperative healing. If the course of the operation is uncomplicated and the other visual functions are not impaired, the prognosis of restoration of vision is excellent, mostly above 98%.

Assessment perspectives

The duration of inability to work is strictly individual. This depends on the condition of the visual functions before and after the operation, on the type of surgical technique and the specifics of the patient's employment.

Prevention of recurrence of condition

Recurrence as such is not possible. However, sometimes a secondary opacity of the lens capsule may occur, with the appearance of a subsequent – secondary cataract. The material of the intraocular lens shares to a large extent in the frequency and intensity of occurrence of a secondary cataract.

An indication for performance of Nd:YAG capsulotomy is opacification of the posterior capsule with deterioration of sight to a level that does not correspond to the functional requirements of the patient or critically impairs visualisation of the posterior segment. The decision to perform a capsulotomy should take into consideration the advantages and risks of laser surgery. The proportion of posterior capsulotomy may be increased in patients with multifocal intraocular lenses, probably because these lenses reduce contrast sensitivity, which is further deteriorated by PCO. Nd:YAG capsulotomy should not be performed prophylactically (i.e. if the capsule remains clear). Bilateral Nd:YAG of posterior capsulotomy on the same day may be appropriate if indicated.

Complication of Nd:YAG capsulotomy include increased intraocular pressure, detachment of the retina, cystoid macular oedema, damage to the intraocular lens and its dislocation. The risk of detachment of the retina after Nd:YAG capsulotomy is increased by axial myopia, as well as previous vitreoretinal disorder, prolaps of the vitreous body into the anterior chamber. The frequency of subsequent checks after Nd:YAG capsulotomy may be variable according to the condition of the patient and concurrent preoperative illnesses. Detachment of the retina as a complication of this method may occur weeks to years after laser capsulotomy. All patients in whom there is an increased risk of detachment of the retina should be instructed to visit an ophthalmologist without delay in the case of a significant change in their symptoms, such as light flashes, a marked increase in the number of vitreous spots, the occurrence of photopsy, a reduction of the field of vision or reduction of sharpness of vision. If patients have been familiarised with the symptoms of detachment of the

***Table 5**

Order	Recommendation	Level
1	Performance of operation simultaneously on both eye not recommended	1
2	Implantation of PC IOL in lens capsule recommended	1
3	Phacoemulsification from small incision	1
4	Continuous curvilinear capsulorhexis (CCC)	1
5	Implantation of PC IOL in lens capsule	1
6	Use of 10% povidone-iodine preoperative on skin of eyelids and 5% povidone-iodine on conjunctival sac and application of fluorochinolone ATB (Levofloxacin or Ofloxacin) or combination of ATB (Bacitracin, Neomycin, Polymyxin) into conjunctival sac	1
7	Implantation of intraocular lens by injector	3
8	Hydrodissection	3
9	Use of OVD and careful removal thereof	4

retina, it is more probable that they will report them immediately after discovering them, which increases the chance of successful surgery and visual results. Indication for surgical discision or excision of the capsule is designated by an ophthalmologist with surgical skill. Possible complications are analogous as in the case of Nd:YAG capsulotomy, but here there is also a risk in connection with opening of the eye.

Recommended further treatments, nursing care or social assistance
It is the obligation of the surgeon performing the operation to guide the patient up to the end of postoperative rehabilitation. If the patient is transferred into the care of another ophthalmologist, the patient must be instructed in advance. The surgeon is obliged to inform the patient about the possibilities of complications, protection of the eyes during the postoperative period, limits on activities, limitations on drugs and the procedure in the case that a visit is essential in an acute condition. In the postoperative period, the patient is similarly obliged to follow the advice and instructions of the doctor and inform the doctor in the case of problems.

Output criteria of process
Following the operation procedure, the patient is examined by an ophthalmologist until the stabilisation of the resulting condition. The usual time for postoperative conservative therapy is 2 to 3 weeks. After this time postoperative refraction is stabilised, and in the case of necessity correction of eye glasses is prescribed. The treatment process is thus concluded, and further checks are recommended only in the case of complaints.

SUMMARY OF RECOMMENDATIONS FOR OUTPUT SECTION

Optical and refractive aspects of cataract operation
Standard intraocular lenses, in which peripheral light rays are measured more in advance than paraxial rays, have a positive spherical aberration. For the patient the result is reduced contrast sensitivity.
Aspheric optical intraocular lenses offer the possibility of improving visual function and the quality of vision by improving contrast sensitivity, limiting light circles and improving optical quality. The clinical data has demonstrated a reduction of ocular spherical aberrations, improved contrast sensitivity and improved night driving in the case of these lenses. A potential danger in certain types of aspheric configuration is the induction of aberrations, in particular comas, in the case of decentring or misalignment of the intraocular lens from the axis.
Toric intraocular lenses reduce dependency on eye glasses, necessitated by astigmatism. 15% to 29% of patients with a cataract have astigmatism of 1.50 dioptre or higher. It has been demonstrated that toric IOL, in comparison with non-toric monofocal lenses, reduces dependency on glasses.
The strategies used in an endeavour to improve the quality of life by reducing dependency on glasses following a cataract operation are monovision and implantation of intraocular lenses correcting presbyopia. For each of these strategies, the indication and decision of the patient is decisive. Surgeons must know the individual lifestyle and expectations of the patient in order to be able to choose the best possible intraocular lens.
Intraocular lenses correcting presbyopia can be divided into multifocal or accommodating.
Multifocal intraocular lenses attain their effect by dividing incoming light into two or more focal points, and it is possible to divide these into refracting or diffracting. Cochrane's systematic overview led to the conclusion that multifocal IOL effectively improve near vision in comparison with monofocal IOL, and that sharpness of distance vision of the eye was similar in both groups. Undesirable effects of multifocal IOL include reduced contrast sensitivity, light circles around the light point sources and glare. Whether or not the improvement of sharpness attained by the nonoperated eye predominates over the undesirable effects of multifocal IOL varies in individual patients, and a decisive factor shall probably be the motivation to overcome dependency on glasses.
Intraocular lenses for the correction of presbyopia, which attempt to simulate human accommodation (accommodation of the intraocular lens), are designed in such a manner as to adjust the position in the eye according to the endeavour to accommodate. The available accommodating intraocular lenses demonstrate a limited accommodating capability, but without loss of contrast sensitivity and with an absence of the symptoms connected with the multifocal lenses.

Cataract operation on second eye
Indication for operation on the other eye is analogous to indication for the first eye. The interval between the two procedures is influenced by a number of factors: subjective satisfaction or problems with vision following the operation on the first eye, sharpness of vision and the functional condition of the as yet nonoperated eye, refraction stability of the operated eye, degree of anisometropia (difference in correction--refraction in both eyes). The result of the cataract operation on the first eye may influence the period for performance of surgery on the second eye. In the case of postoperative anisometropia which is negatively influencing the patient's quality of life, a cataract operation on the second eye is indicated as soon as possible (from 1 to 3 weeks), even in the case that the cataract in the second eye is only in its initial stages.

Postoperative pharmacological care
Postoperative therapy includes the application of fluorochinolone ATB (Levofloxacin or Ofloxacin) or a combination of antibiotics (Bacitracin, Polymyxin, Neomycin), or a combination with antiphlogistics of a non-steroid and steroid type for a duration of two to three weeks after the operation.
In the case of complications the final examination is by an ophthalmologist after all complications have been resolved.

Results

Recommended information for data gathering for the purpose of evaluation of process

During treatment, monitoring is concern on the visual functions of the patient, intraocular pressure and local ophthalmological finding: condition of healing, postoperative inflammation, condition of cornea, iris, lens capsule, arteficial lens position, condition of retina.

Recommended criteria and indicators of quality of treatment
The criteria for quality of treatment are sharpness of vision 3 months after the operation, average induced astigmatism 3 months after the operation and the number of surgical complications including the frequency of secondary cataract. A significant criterion is the subjective evaluation of the result of the operation by the patient.

SUMMARY OF RECOMMENDATIONS FOR RESULTS SECTION

***Table 6**

Economic aspects of standard

Value of cataract surgery
The evaluation methods concerning whether the price of the provided healthcare is a good utilisation of the avai-

*Table 6

Order	Recommendation	Level
1	Sharpness of vision 3 months after operation	1
2	Average induced astigmatism 3 months after operation	2
3	Number of surgical complications including frequency of secondary cataract	1
4	Subjective evaluation by patient	1

lable resources include calculations of cost-effectiveness or utility of costs. Whilst cost-effectiveness deals with the monetary value, utility of costs includes the quality of years of life gained as evaluated by the patient, expressed by the parameter entitled quality-adjusted life year – QALY. QALY is a general gauge of the resulting improvement of quality and quantity of life following the provision of healthcare, and as a result enables a comparison of the value of the provided healthcare in the case of various health complaints. In the case of a QALY calculation, economic methods of deduction are used for expressing the time value of money, because the effect gained from the money spent on care remains throughout the entire life of the patient. **The lower the calculated amount of one QALY, the greater the value of the provided care.**
From a study in Sweden (2) and one study in the United States, the hypothetical costs of one QALY obtained by the removal of a cataract in one eye were evaluated at USD 4 500.00. In the American study (3, 4) the costs for a QALY gained by a cataract operation on the first eye were estimated at USD 2023.00, and on the second eye USD 2 727.00 (calculation from 2003). These values relating to cataract surgery are favourable in comparison with the values stated in other ophthalmological procedures (5). Upon a comparison of procedures in other fields – e.g. simple bypass on coronary artery in the case of disorder of the left or recessive branch, the costs for QALY are USD 7 000.00, which demonstrates the value of cataract surgery.

Important information for patients

Causes of condition and possibilities for prevention
Primary prevention ensues from the elimination of potential risk (e.g. UV radiation, nicotine addiction, alcoholism, traumas, severe long-term dehydration etc.). Secondary prevention resides in inter-disciplinary co-operation and timely receipt of the patient into the care of an ophthalmologist-specialist.
What help is available
Treatment of cataracts is exclusively surgical. The primary indication for a cataract operation is an impairment of the visual functions of the eye and subjective complaints of the patient as a result of a cataract of the lens, with a negative impact on the patient's quality of life.

Available types of care and how they work
Operation of a cataract is performed mostly as outpatient care. Short-term hospitalisation is recommended in the case of the presence of at least one of the following factors:
- Allergy to povidone-iodine, analgetics, latex
- Chronic MRSA carrier state
- DM (diabetes mellitus), subcompensated IHD (chronic Ischemic heart disease)/ arterial hypertension/ COPD (Chronic Obstructive Pulmonary Disease)
- Anticoagulation therapy
- High axial length of eye
- Chronic dialysis
- Previous surgical intervention in orbit
- Language barrier, hearing disorder
- Tremor, illness accompanied by uncontrollable movements
- Photophobia, blepharospasm, illness accompanied by uncontrollable eye movements
- Mental disorders
- Phobic / anxiety / panic disorder
- Age over 35 years.

How do drugs work, and what are their side effects?
Cataract treatment is exclusively surgical. Effective pharmacotherapy is not known.

Usability of standard for concentration of care

Statistics:
- Percentage of occurrence of patients for correction of intraocular toric lens (30%)
- Percentage of occurrence of patients for correction of intraocular multifocal lens (6%)

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