JUNE 2002

L YOUR PARTNER IN LIFE
insurance medicine

MEDLETTER

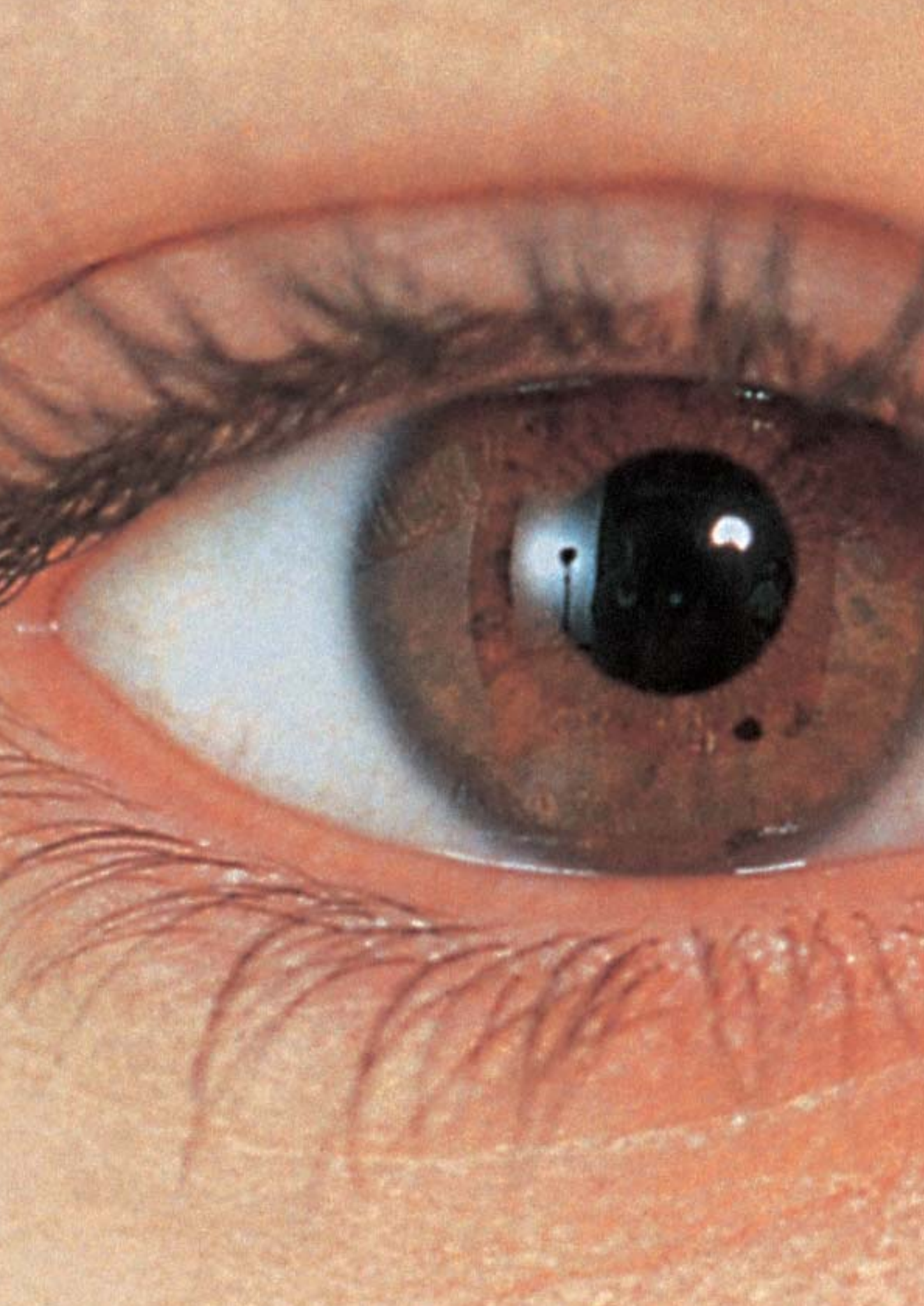
01 Diseases of the eye

Good eyesight is not just something to be taken for granted but rather an important prerequisite for social integration and professional performance.

As modern technology gains in importance, the requirements to take in, review and utilize information

are continuously increasing. Our eyes give us more impressions than any other of our sense organs. While the number of jobs with mainly physical effort is progressively decreasing, ...

Münchener Rück
Munich Re Group



... not only has the number of jobs in front of a computer monitor risen dramatically but the intensity of computer use has also increased. This is very hard work indeed, even if it is not always regarded as such. In a single working day, the gaze of the computer user goes back and forth between manuscript, keyboard and monitor many thousand times. The eye has to focus immediately at different distances. And so illness-related absence from the computer workplace has gone up – and often led to complete disability. Many users are sure that their eyes have deteriorated using the computer. To date this association has not been clearly proved. It is not disputed, however, that ever-greater demands are being made on our eyesight.

The normal eye

Light rays entering the eye through the **PUPIL** meet on the retina at the point where the vision is most acute. This point is called the central retinal **FOVEA**, "the yellow spot".

For the human brain to receive a clear image, the light rays must meet at the fovea. **ACCOMMODATION**, the adjustment of the eye for seeing objects at different distances (from near to far), depends solely on the lens of the eye. This lens is flexible and its curvature is controlled by sensitive muscles.

The most common abnormalities of vision

NEAR-SIGHTEDNESS – MYOPIA
The refractive power of the eye is too great. In its relaxed state, the eye is focused on a point closer than normal. This is due to the structure of the eye: the curvature of the cornea, the "window" of the eye, is too great in relationship to the length of the eyeball. Close to, near-sighted persons can see everything sharply without glasses. For clear distant vision (driving, blackboard at school) they need glasses. The relatively too-great refractive power of MYOPIA is corrected by concave lenses which counteract the excessive refraction of the cornea. For this reason they are referred to as "minus" lenses and their refraction given in negative diopters, e.g. –2 D.

FAR-SIGHTEDNESS – HYPEROPIA
HYPEROPIA is usually caused by the eye being too short, although sometimes it may be due to the curvature of the cornea being insufficient in relation to the length of the eyeball. Distant objects can be seen clearly but there is a problem with near vision. Since (for as long as the lens remains sufficiently flexible) young eyes can compensate to a certain degree for this visual defect through accommodation, far-sightedness is usually first discovered as the person becomes older.

The associated constant ACCOMMODATION may cause headaches or blurred vision after reading for any length of time. Children may be reluctant to read as they find it too strenuous. Correction of far-sightedness is carried out with "plus" lenses (e.g. +2 D). These lenses increase the refractive power of the optical system. The light is no longer focused behind the retina but onto the retina to give a sharp image.

ASTIGMATISM –
REGULAR AND IRREGULAR ASTIGMATISM
The abnormality of vision caused by an unphysiological change in the curvature of the cornea is called ASTIGMATISM.

Images become distorted. The effect on the vision of this corneal irregularity gives the impression of looking in a wavy mirror. A round object, e.g. a ball, may appear as a line or a rod.

An irregularly curved corneal surface gives rise to IRREGULAR ASTIGMATISM. Not only are the axes changed but also displaced with respect to each other. This irregularity may be caused by scarring of the cornea following disease.

The eye continually tries to compensate for the refractive errors. Overuse of the accommodation apparatus may lead to headaches. ASTIGMATISM may occur in combination with near- or far-sightedness. Astigmatic errors can be corrected by glasses with cylindrical lenses. The degree of astigmatism is given in cylinders (+/– cyl).

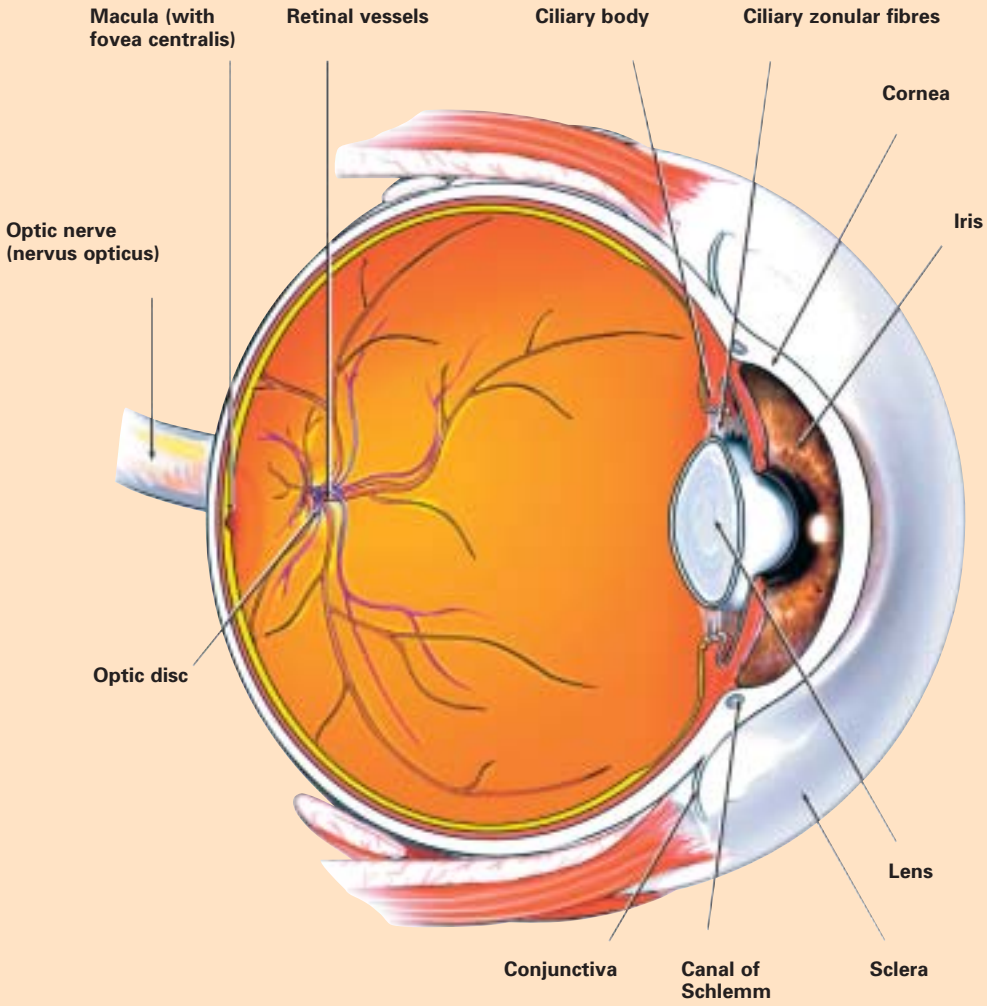
CHANGES WITH AGE – PRESBYOPIA
With increasing age, there is loss of elasticity of the lens. The ability to accommodate becomes progressively restricted after the age of 40 years. Since the greatest changes in the curvature of the lens are needed to see near objects, the increasing rigidity of the lens means that with time people become PRESBYOPIC.

From about the age of 45 years onwards, a person will notice difficulties in reading. The newspaper is held further and further away – time to get reading glasses!

Average strengths of reading glasses

Age 45 years	+1 D
Age 50–55 years	+2 D
Age about 60 years	+2.5 D
Age about 70 years	+3 D

The structure of the human eye



KERATOCONUS

KERATOCONUS is a disease of the cornea. The cornea arches outwards like the point of a cone and becomes thinner. Often both eyes are affected. The image on the retina is irregularly distorted. The patient's vision is blurred. Depending on the progress of the condition, the cornea may be so severely arched that overstretching causes tears in the connective tissue.

Keratoconus is a progressive disease which may, however, remain stable for long periods. In the initial stages, it is often possible to correct the visual defect of keratoconus with glasses. Later the cornea becomes so irregular that the diminishing visual acuity and increasing distortion can only be compensated with special contact lenses. If these special lenses no longer help, there is still the possibility of corneal transplantation, which is usually successful. The majority of corneal transplant recipients again have satisfactory visual acuity after the operation.

LENS OPACITY – CATARACT

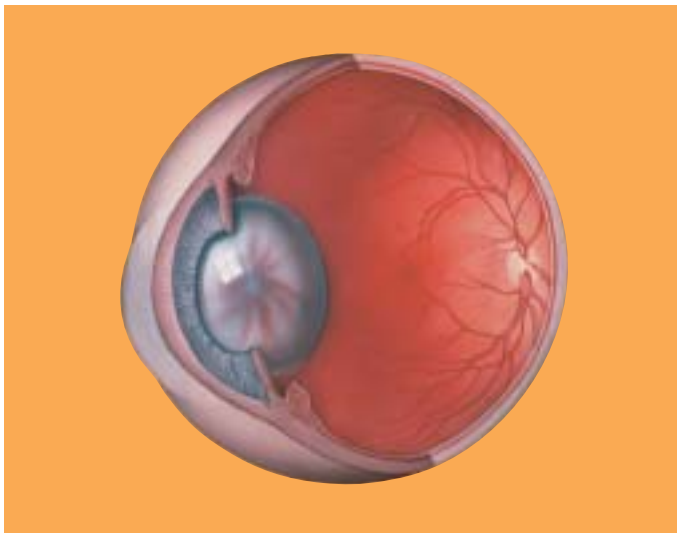
OPACITY or cloudiness of the lens is known as CATARACT. The patient has the feeling of looking through a thin veil which becomes thicker with time. SENSITIVITY TO GLARE often increases (drivers!). The most common cause of cataract is age-related degeneration of the lens tissue. This does not usually start before the age of 60 years. When the initially slight opacification of the lens worsens, surgical removal is the only treatment option. Implantation of an artificial lens replaces the refractive power of the natural lens which has been removed. The operation is almost always successful. Even patients of advanced age can be operated on successfully.

GLAUCOMA

GLAUCOMA is not a single disease entity but includes a group of conditions in which the optic nerve is damaged in a characteristic manner. Raised INTRAOCULAR PRESSURE (more than 21 mm Hg) is responsible. This causes pressure damage to the optic nerve and reduces the blood flow to it. The intraocular pressure is not the only factor in the development of glaucoma, however, as there are many patients who have a normal intraocular pressure (10–21 mm Hg) and still suffer typical glaucomatous damage. These cases are referred to as NORMAL- or LOW-PRESSURE GLAUCOMA. Conversely, raised intraocular pressure does not always lead to glaucomatous changes ("OCULAR HYPERTENSION").

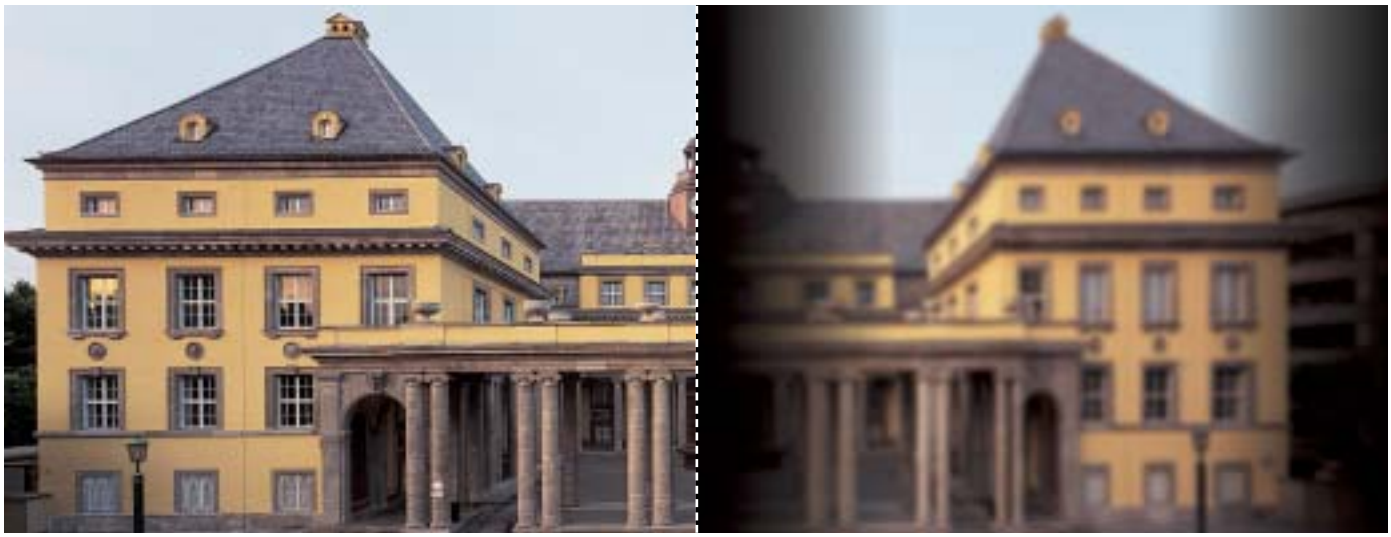
Normal corneal curvature

Keratoconus



Lens opacity – Cataract

A healthy eye **Keratoconus**



A healthy eye **Glaucoma**

A healthy eye **Cataract**

Methods of examination used by the ophthalmologist

DETERMINATION OF VISUAL ACUITY

The VISUAL ACUITY is the ability of the eyes to distinguish two points lying closely together. Reading charts (Snellen charts) are used to test vision.

If the test subject can recognize a sign that should normally be distinguished at 50 m at a distance of 5 m, then the visual acuity is 5/50 or 0.1. Visual acuity is thus obtained from the ratio of the measured distance to the nominal distance.

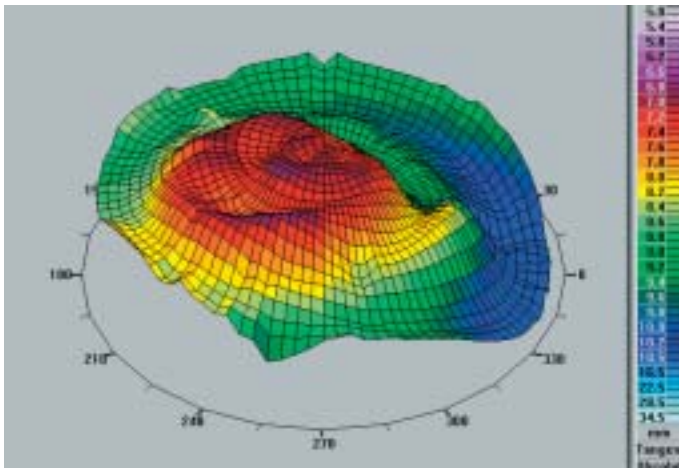
WHAT IS 100% VISUAL ACUITY?

A value of 1.0 is ascribed to normal visual acuity. Mathematically speaking, 100% visual acuity should correspond to a value of 1.0. However, since visual acuity in young people may well be 2.0, a visual acuity of 1.0 would be only half of "normal vision". The habit of giving visual acuity as a percentage is widespread, but is often imprecise and confusing.

Measured distance/ Nominal distance	Visual acuity
5 m/5 m	1 or 5/5
5 m/50 m	0.1 or 5/50
5 m/10 m	0.5
5 m/20 m	0.25
5 m/4 m	1.2

CORNEAL TOPOGRAPHY

CORNEAL TOPOGRAPHY is of importance for fitting contact lenses and planning surgical procedures on the cornea. The topography of the cornea is the decisive factor in the diagnosis of keratoconus as the underlying cause of astigmatism. This examination of the corneal surface involves constructing a type of relief map which shows areas of differing refractive power. Concentric rings are projected onto the cornea and the reflections of these recorded with a video camera. The image is then digitalized and a relief map constructed from the intervals between the rings at several thousand points.



An image of the surface of the cornea (corneal topography) shows details of the conical extension of the usually rounded corneal surfaces in advanced keratoconus.

The latest topography systems not only provide a representation of the corneal surface but can also analyse its posterior surface and the corneal thickness. The depth of the anterior chamber of the eye and the IRIS are also recorded.

MEASUREMENT OF THE INTRAOCULAR PRESSURE – TONOMETRY

The normal INTRAOCULAR PRESSURE in adults lies between 10 and 20 millimetres of mercury (mm Hg). TONOMETRY has to be performed if there is a suspicion of glaucoma. This examination is also essential for the follow-up of glaucoma patients.

The cornea is flattened about four millimetres with the TONOMETER. The force required to do this is measured and corresponds to the intraocular pressure.

FUNDUSCOPY – OPHTHALMOSCOPY

One of the standard examinations carried out by an ophthalmologist is FUNDUSCOPY. Using the OPHTHALMOSCOPE, the doctor can examine the back of the eye (fundus) and the vessels that are to be found there. The entry of the optic nerve and the point where vision is sharpest (fovea) are assessed. Changes due to high blood pressure, bleeding and diabetic retinal damage can be determined.

SLIT LAMP EXAMINATION

The SLIT LAMP is used to examine the anterior and middle segments of the eye including the lens and the nearest part of the vitreous. With additional optics, the posterior segment and the IRIDOCORNEAL ANGLE can be visualized. The slit lamp consists of a microscope and light source. The smallest changes in the cornea, foreign bodies, etc. can be recognized by this means.

VISUAL FIELD TESTING – PERIMETRY

The VISUAL FIELD is the area of the outside world which the eye can perceive when looking straight ahead. PERIMETRY is the measurement of the extent of the visual field. It tests peripheral or indirect vision. Gaps in the visual fields are known as SCOTOMAS.

Modern PERIMETERS are computer-guided. Very small test lights are briefly displayed. The person being tested presses a button when he/she has seen a light signal. Besides pressure measurement, regular examination of the PAPILLA and the visual fields are the mainstays of monitoring glaucoma patients. (The papilla is that area of the retina where the nerve fibres collect before leaving the eyeball.)

FLUORESCEIN ANGIOGRAPHY

FLUORESCEIN ANGIOGRAPHY entails the injection of a fluorescent substance into a vein and observing the flow of this substance through the blood vessels, e.g. in the retina of the eye.

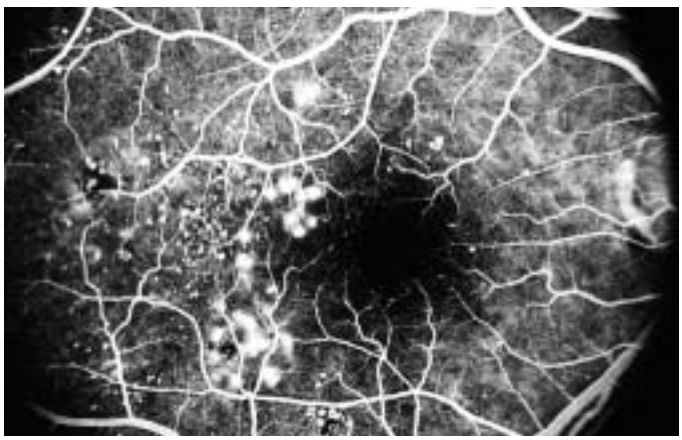
Any leakage of fluid from the vessels can be determined by means of fluorescein angiography. The cause of this leakage may be inflammation of the vessels, for example. MICROANEURYSMS, or very small dilatations, can also be visualized with fluorescein angiography.

This method is used to demonstrate early damage to the retina in diabetics, or if inflammation, tumours or occluded blood vessels are suspected.

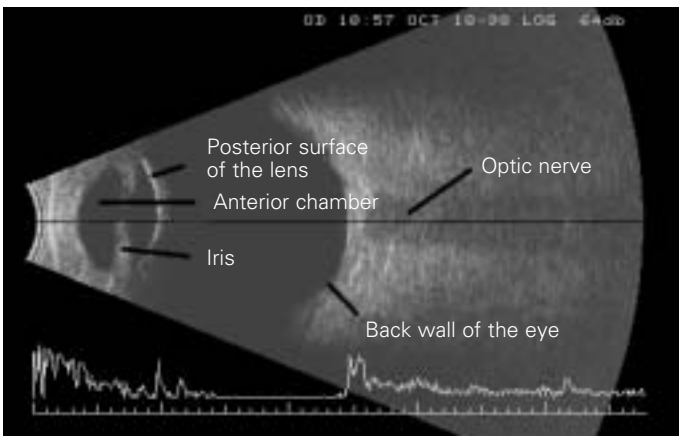
ULTRASOUND EXAMINATION OF THE EYE

Especially when it is not possible to see into the eye with an OPHTHALMOSCOPE, e.g. if there is a cataract, ULTRASOUND EXAMINATION of the eye is performed. Contact gel is smeared onto the closed eyelid and the ultrasound probe placed on that.

Ultrasound scanning can provide useful information in cases where there is a painful eye, swelling behind the eye, or suspicion of a tumour within or behind the eye.



Fluorescein angiography



Ultrasound examination

Understanding the optical prescription

The right eye is given with OD **(oculum dextrum)** or RE, the left eye with OS **(oculum sinistrum)** or LE. The prescription consists of three components: the sphere, the cylinder and the axis. The sphere gives the near- or farsightedness. A spherical value of "nil" is described with the word "plano". If the power is negative, there is nearsightedness; a positive power is a prescription for farsightedness.

The cylinder and the axis give the astigmatic correction. The cylinder relates to the lens power required in the corresponding direction. This power can also be positive or negative (+/–). The axis represents the direction of the power and is measured in degrees from 1 to 180.

Seeing glasses

Frame: Specimen Co.
4031 462 46/20

Glasses: ROD Cosmolux 1.6
Brunal 12% Supersin 62 mm

	Sph.	Cyl.	Axis
R(OD)	–4.50	–0.25	080
L(OS)	–4.50	–0.25	080

Date: 25.1.2002

Example of a prescription for glasses

New methods of treatment

PHOTOCOAGULATION (RETINAL LASER)
Most uses of lasers in the eye involve the retina and the choroid. **RETINAL HOLES** can be "welded" by burns to prevent dangerous retinal detachment. Proliferative new blood vessel formation in **DIABETES** can be dealt with using lasers. The surgeon places a special "contact lens" on the eye, which guides the laser beam onto the retina. **RETINAL LASERS** cause temporary overheating of the tissue to about 80°C, which leads to scar formation within a few days or weeks.

PHOTOABLATION (EXCIMER LASER)
The **EXCIMER LASER** is becoming an increasingly popular method of treatment, especially for the correction of near-sightedness. Using this special laser, the refractive power of the cornea is so changed that additional optical aids are no longer required for optimal vision.

Two common surgical procedures with the excimer laser are used to correct abnormalities of vision:

1 PRK (PHOTOREFRACTIVE KERATOTOMY)

PRK is suitable for correcting referactive errors of up to about –6 D. The procedure to correct refraction is carried out directly on the corneal surface. This is a great disadvantage of the method as it leaves a painful wound surface and carries an increased risk of infection with subsequent scarring.

2 LASIK (LASER-ASSISTED IN-SITU KERATOMILEUSIS)

LASIK is increasingly used today to correct abnormalities of vision from +5 D to –10 D and astigmatism up to 5 D. Correction of myopia greater than –10 D is not attempted by specialists because of uncertain results and more frequent complications.

The procedure to alter refractive power takes place within the cornea itself. First, a thin flap of cornea is partially separated by means of a computer-guided "slicer" and opened upwards like a lid. The inside of the cornea is then removed and reshaped with the excimer laser. Finally, the corneal flap is closed and pressed back into place.

LASIK has been used since about 1990 and is recognized by the German Association of Ophthalmologists to be a scientific procedure with a low complication rate. The advantage of LASIK over the earlier PRK procedure is that the outer surface of the cornea is not destroyed and there is considerably less scarring after LASIK than there is after PRK.

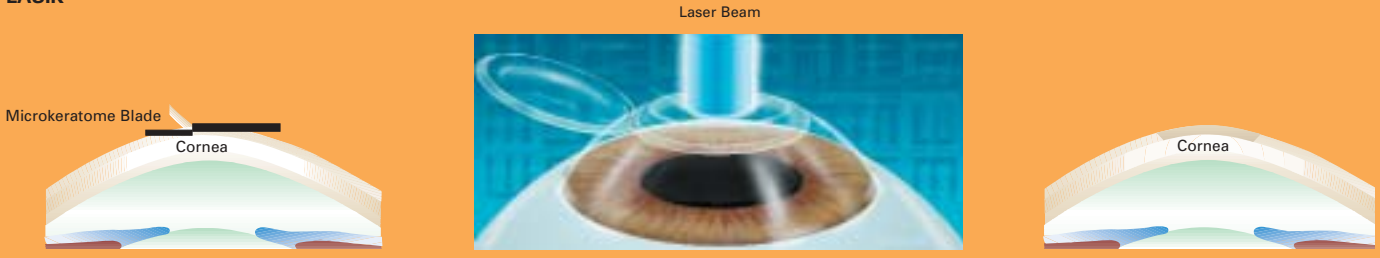
The operations described have permanent effects on the eye and thus bring about unalterable changes – in both a positive and a negative sense. Even though they are very rare, once adverse effects or complications have set in, there is not much that can be done about them. In addition, the operation will not replace the reading glasses that will become necessary from about the age of 45 years due to the diminishing flexibility of the lens of the eye.

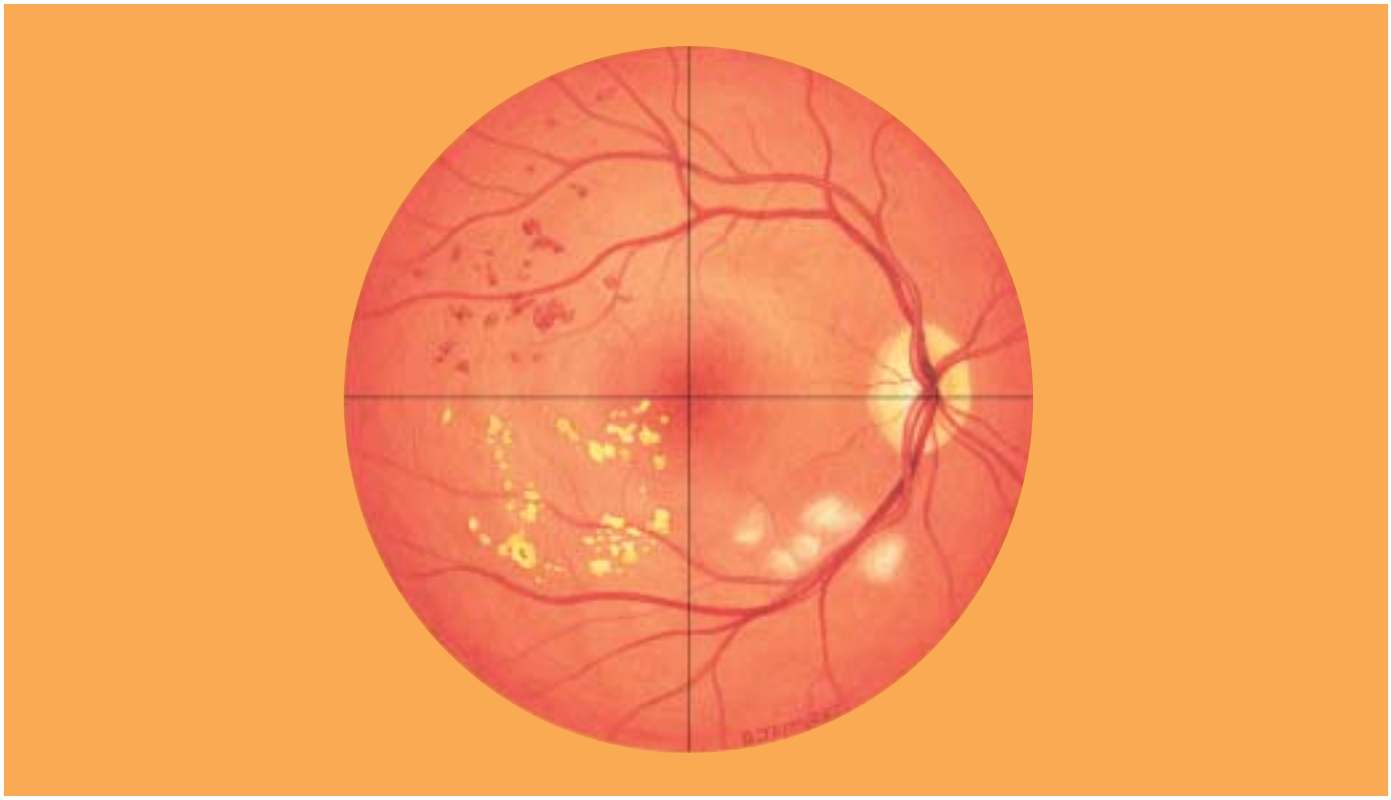
As the number of surgical procedures carried out recently has risen, so has the number of complaints from dissatisfied patients. Increased **SENSITIVITY TO GLARE** and perception of ghost images lead the list of unwanted effects following the operation.

PHOTODISRUPTION (YAG LASER)
Use of the **YAG LASER** is referred to as **"PHOTODISRUPTION"** (= tissue breakdown by light).

The disruptive effect of this laser can be targeted very precisely, e.g. to cut out holes in the clouded posterior lens capsule or in the iris. The eye can be cut inside without having to open up the eye first.

LASIK





Retinal detachment

Current information on the subject

FACTS AND FIGURES

– Up to 30% of patients with **KERATOCONUS** undergo **CORNEAL TRANSPLANTATION** in the course of their disease. A quarter of all corneal transplants are due to this condition.

– Worldwide, **GLAUCOMAS** are the cause of about 5.2 million cases of blindness. In total some 105 million people suffer from glaucoma. Glaucoma occurs more frequently in some population groups, for example those of African or Asian origin are more often affected than Europeans.

– Every year in Germany about 400,000 patients are operated on for age-related **CATARACTS**.

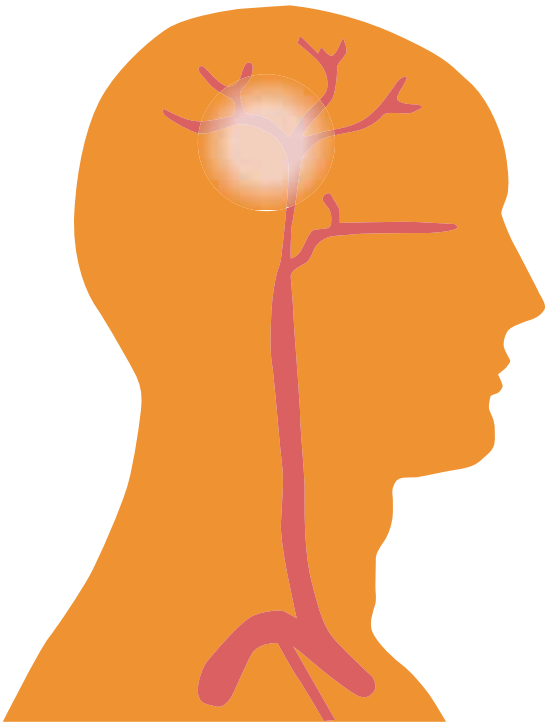
– In industrialized countries most cases of severe visual impairment in adults are due to **DIABETIC RETINOPATHY**. Diabetic retinopathy develops in about 20–25% of diabetic patients within five years while some 95% are affected after having the condition for 15–20 years. After 20 years of diabetes mellitus 50% of patients have proliferative retinopathy. After only five to eight years, 5–7% of all type-1 diabetics have proliferative retinopathy. All the more surprising therefore, that 20% of diabetics develop only a mild non-proliferative retinopathy even after having the disease for a very long time (40 years!).

– Up until 1996, 80,000 refractive errors were treated in the USA by LASIK. The following year, 220,000 cases were treated. In 1998, the figure rose to 430,000 and in 1999 more than one million people were treated with this method.

A healthy eye **Retinal detachment**

DID YOU KNOW?

The risk of stroke can be recognized early at the back of the eye



Ophthalmologists can often determine changes at the back of the eye (fundus) in patients with raised blood pressure. This is referred to as **HYPERTENSIVE RETINOPATHY**. The risk of stroke can be predicted from knowledge of the hypertensive changes in the fundus of the eye. Hypertension and arteriosclerosis of the blood vessels are the main risk factors for cerebrovascular accident (stroke) which affects approximately 150,000 people in Germany every year. The stroke is fatal in about a third of these people.

The blood vessels of the fundus show the degree of disturbance of the blood flow through the brain caused by high blood pressure and arteriosclerosis. It is thus possible by examining the delicate blood vessels at the back of the eye to detect whether the person is at **RISK OF STROKE**. Visible signs of the increased risk of stroke are narrowing of the vessels and microemboli of the retinal vessels. As a rule, these microemboli (very delicate plaques) are dislodged from the walls of the carotid arteries that have undergone arteriosclerotic change. They are carried by the blood stream into the vessels of the eye and brain. Depending on the hypertensive changes that can be seen, an ophthalmologist will grade the hypertensive retinopathy as grade 1 to grade 4.

Eagles see better

Birds, particularly birds of prey such as the eagle and the falcon, have much better vision than humans. A small object such as a mouse that humans can just make out at a distance of 50 m, can be seen by an eagle at 350 m. This means that the eagle has a visual acuity of 7.0 (“700%”). A human being cannot see so sharply as the power of resolution of our retina – the film in the eye – is not sufficient. The enormous visual acuity of the bird of prey is the result of the extraordinarily thick layer of **LIGHT RECEPTORS** which coat its retina. The retinal base of the eagle’s eye is equipped with more than a million receptor cells that make this a telescopic lens. In contrast, the human eye resembles the first attempts at photography.

WHO sounds the alarm: the number of people suffering from severe visual impairment is increasing rapidly

According to the World Health Organization (WHO), in another quarter of a century there will be 300 million people worldwide with severe visual impairment or blindness; twice as many as today. Older people, the number of whom will also have doubled, will be the most affected – accounting for about 80% of all cases of irreversible blindness. Blindness and serious visual impairment will thus be of tremendous socio-economic importance with tangible consequences in countries with limited economic power.

Diabetes endangers eyesight – Diabetic retinopathy

This is brought about by changes in the retinal blood vessels in diabetic patients. Vessels are occluded and dilatation of the capillaries occurs. Later new vessels form which grow into the vitreous from the retina. At this stage, the eyesight is greatly at risk. Bleeding into the vitreous occurs from the vascular growth. At the same time bands form that detach the retina from the underlying tissues, the choroid. This type of diabetic retinal disease is called **PROLIFERATIVE DIABETIC RETINOPATHY.** The condition leads to blindness if it is not possible to restrict its advance.

Healing of diabetic retinopathy is not possible at the present time. The earlier the vascular changes are recognized and treated by the ophthalmologist, however, the less invasive the treatment has to be.

Today it is possible in the early stages of diabetic retinopathy to prevent any further advance of vascular changes by laser coagulation. Targeted light rays are aimed at the diseased blood vessels, and this also prevents further vascular changes.

In severe forms the affected eyes can now often be saved from complete blindness by an extensive operation – aspiration of the blood from the vitreous and refilling it, usually with silicon.

The extent of the diabetic retinopathy indicates the degree of **MICROANGIOPATHY,** or damage to the small arterial blood vessels. **DIABETIC ANGIOPATHIES** include all types of arteriosclerosis, such as coronary artery sclerosis, cerebrosclerosis, and sclerosis of leg and renal arteries. The risk is reflected in the statistics: diabetics with proliferative retinopathy have a considerably greater risk of myocardial infarction than healthy people.

INTERVIEW WITH AN EXPERT

Dr. Thomas Hamacher, ophthalmologist and master optician, talks to us at the Department of Insurance Medicine of Munich Re about common ophthalmological problems and current questions of risk assessment in connection with life insurance.

MR: Often when we have to make a risk assessment, we have very little information to go on. Is the information that the visual acuity with correction is 1.0 sufficient to conclude that the refractive error is not serious?
Dr. Hamacher: Prognostically, **REFRACTIVE ERRORS** are generally harmless if they relate only to a regular corneal curvature. It is important to recognize the irregular types of corneal curvatures such as are found in keratoconus, for example. Ophthalmologists should be suspicious if the astigmatism is greater than 1.5 (1.5 cyl – Ed.). In this case, corneal topography should be carried out to determine whether the astigmatism is in fact keratoconus, which is a condition of the cornea that needs to be taken seriously. Although this can remain stable for years with a problem-free course, and can be corrected with hard contact lenses, the situation may change rapidly. You cannot predict whether and when the condition will deteriorate dramatically and whether the eyesight can then only be improved with operative correction.

Even with near-sightedness of relatively small dioptric values, thin places frequently occur on the retina as result of its stretching and these may lead to retinal tears and detachment.

MR: In disability insurance we cannot generally make every astigmatism the subject of an exclusion clause. How can the critical cases be recognized?
Dr. Hamacher: You can ask for the visual acuity and also ask how often the correction has been altered in the past three years. If, for example, the correction has been altered twice a year, this is extremely suspect and must raise the suspicion of an irregular type of astigmatism and the existence of keratoconus.

MR: What are typical complications of extreme near-sightedness with values greater than –8 D? Is less pronounced myopia less affected by these complications?
Dr. Hamacher: There is no close correlation between the degree of **MYOPIA** and the associated complications. Experience over the past ten years has shown that regular ophthalmic check-ups really should be carried out, regardless of the degree of near-sightedness. Even with near-sightedness of relatively small dioptric values, thin places frequently occur on the retina as result of its stretching and these may lead to retinal tears and detachment. If retinal tears are recognized early they can easily be fixed, e.g. with lasers, and the danger of retinal detachment is widely averted. With near-sightedness of –2 D and more, prophylactic examination of the retina should be performed annually.

MR: It seems that operative correction of refractive abnormalities is becoming increasingly popular. Can one assume cure with long-term stable results or are late complications to be reckoned with?
Dr. Hamacher: With the **LASIK** technique which has become the standard procedure for refractive surgery, we can look back on about 10 years of experience. The results are good. Against the euphoria of the initial years, however, the procedure should be judged in a more differentiated and rational manner as recent reports have shown that 10–15% of patients are not completely satisfied with the results of their operation.

A healthy eye | Retinal detachment

MR: What do these patients complain of? Which particular problems may arise?
Dr. Hamacher: Patients complain of increased sensitivity to glare, difficulties in seeing in the twilight, double vision and blurred vision. LASIK procedures only treat a part of the cornea. The refractive errors are still to be found in the remaining cornea. This is not a problem in the daytime as the pupil is narrowed with strong lighting, and the light can enter the eye only through the treated part of the cornea. In the twilight or darkness, however, the pupil is dilated and symptoms of glare, halos or ghosting appear. This can really be a problem when driving at night. This should not detract from the value of these procedures, as the technique has tremendous potential. Advances are to be expected in precisely those areas of the problems just mentioned, which arise because of previously unrecognized aberrations. LASIK is basically a well-recognized technique. It is important, however, to remember that an operative procedure is carried out on an eye that is in itself healthy. As a rule, the reason for this operation is cosmetic. Basically, LASIK is only suitable for myopia of less than –10 D. With a greater degree of near-sightedness, this procedure may bring not only insufficient correction but also complications that seriously affect the vision.

Today, most cases of glaucoma should be treatable for many, many years with lasting maintenance of vision.

MR: Since there are still no real long-term results, one can only speculate on how constant the conditions are. And with a "vision-sensitive" profession, we shall have to continue to protect ourselves with an exclusion clause in the disability insurance.

Dr. Hamacher: Yes, today we have to look at things that way. No one can, in good faith, make a prognosis that covers the period of time over which insurers usually think. The method is still too young for that.

MR: What possibilities are there to assess how well glaucoma is under control?
Dr. Hamacher: The long-term prognosis is good if the visual field shows no defects as a result, the optic nerve is normal or shows no progressive changes and the intraocular pressure can definitely be kept under control with medication. Today, most cases of **GLAUCOMA** should be treatable for many, many years with lasting maintenance of vision. In the first years after the diagnosis has been made, however, there are no certain indicators on which the insurer can rely.

MR: In which areas of ophthalmology do you see the greatest potential for development in the coming years?
Dr. Hamacher: Definitely in prophylaxis. Let's take **SQUINTS** for example. 10% of all young children have risk factors that without treatment lead to poorer vision. These include the more obvious abnormalities of vision that can be compensated with glasses, and smaller degrees of squint which the parents don't notice. In 90 to 95% of these children the condition is not picked up by the usual check-ups or is discovered too late. Even by the time the child goes to school it is usually too late for optimal treatment. The vision in an eye that has not been treated in time remains weak for the rest of the life. We ophthalmologists recommend parents to take their children to an ophthalmologist by the age of two years at the latest to prevent life-long disability.

Glaucoma, the most common cause of preventable blindness, must also be mentioned here. Without doubt, population-wide screening for glaucoma after the age of 40 years is needed and would be extremely beneficial.

MR: Dr. Hamacher, thank you for talking to us.

A CASE IN PRACTICE

D DESCRIPTION OF THE CASE

32-year-old carpenter
Cover requested: Life and additional disability insurance

Fourteen years previously, medical examination on starting military service first revealed raised blood pressure. On follow-up investigation "labile hypertension" was diagnosed. At the time of applying for the insurance, in the course of examination for the required medical report, a clearly raised blood pressure was once again measured: 160/100 mm Hg. The applicant was therefore referred to a specialist for further investigation. Once again, raised blood pressure was found. Laboratory and technical investigations (ECG and stress ECG) were normal. However, on questioning, increasingly "blurred" vision was mentioned. Referral to an ophthalmologist for examination regarding hypertensive changes in the eye showed a normal fundus with nothing of note. As an unexpected finding, however, an early **KERATOCONUS** of the left eye was diagnosed. Ambulatory 24-hour blood pressure monitoring showed normal readings over the course of the day. The specialist made a diagnosis of "**WHITE COAT HYPERTENSION**".

D OUR DECISION IS

Life: Borderline case

Additional DI: Normal contribution with exclusion clause "bilateral keratoconus together with all consequences and complications"

C COMMENTS

The high blood pressure measured repeatedly over a period of 14 years suggests at first that there is hypertensive disease. But it is the results of the 24-hour tape that give a decisive indication of white coat hypertension. This is characterized by an inappropriate rise in blood pressure in emotionally demanding situations (typically: visiting the doctor). **The normal findings on funduscopy remove any lingering doubts as to the benign nature of the raised blood pressure.** Further findings are not required.

With the presence of keratoconus, it must be assumed there will be slow deterioration of the eyesight. Disability risk can therefore only be covered subject to the exclusion of this condition. The clause should not be restricted to one eye since this disease may affect both eyes with time. Waiving this clause, e.g. with a risk supplement, would not be justified here because of the clearly increased risk.

Risk assessment in disability insurance – Assessment in practice

REFRACTIVE SURGICAL PROCEDURES (PRK, LASIK)

The aim of refractive surgery is to provide operative correction of abnormalities of vision. Operative procedures on the cornea or lens attempt to correct the refractive power so that light rays or images form sharply on the retina without additional optical aids (glasses, contact lenses).

– Where any of the following occupational factors apply please rate as ⊖

· Operating industrial machinery/commercial driving
· Particular requirements for vision

– **Exclusion clause:** No claim shall be admitted in respect of any disease, disability, disorder, injury, any operation, or treatment, whether directly or indirectly caused by refraction anomalies (myopia/hyperopia/astigmatism).

– A **successful operation** may be assumed if a visual acuity is achieved that is not worse than 0.8, with or without correction with glasses or contact lenses, and no further correction is planned. There should be no cause for doubt with respect to the subjective information given about the person's vision after the operation.

	⊖	⊕
Operation planned	Postpone, possibly excl.	Excl.
Successful operation		
– 0–3 months	Postpone	Excl.
– 3 months and more	Excl.	0
Other cases	Excl.	Rate for underlying condition/ according to findings

INDEX

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