*Fotoalbum

4. celostátní studentské konference Optometrie

Brno, 17. říjen 2013

Foto : Bc. Martin Vokoun

Sestavila : Mgr. Sylvie Petrová

* V následujícím jsou zachyceny momenty z průběhu konference, od prezence přes přednášky, workshopy, postery i přestávky…..

..je na Vás, jakou vzpomínku si vyberete….

….. Uvítání a prezence ….

Sborník dnešní konference naleznete na adrese :

www.is.muni.cz – dokumenty – LF - zprávy pracovišť - Katedra optometrie a ortoptiky

Vítáme Vás

4. CELOSTÁTNÍ STUDENTSKÁ KONFERENCE OPTOMETRIE

Brno, 17.10.2013

Děkujeme za podporu vedení LF MU a sponzoru - firmě ESSILOR

essilor


RUČNÍKY Z-Z
ŠEDÉ


NATURE AND CULTURAL LANDSCAPE
PROTECTION FROM A HISTORICAL
PERSPECTIVE - THE CASE OF THE
LEDNICE-VALTICE CULTURAL LANDSCAPE
HOSTÉ
(guests)


GREEN IDEAS
IN CZECHOSLOVAK LAND USE PLANNING
Exploring Theories of Spatial Planning
with Focus on the 1940s and 1960s
P 31


Děkujeme za podporu vedení LF MU
a sponzorům firmě ESSILOR
essilor
SNÍMEK 1 Z 2
ČEŠTINA
POZNÁMKY
KOMENTÁŘE
70 %
CS
9:51
17.10.2013


George Mayer, MD .
auspices of
essilor


ěkujeme za podporu vedení LF MU
sponzoru - firmě ESSILOR
essilor


Děkujeme za podporu vedení LF MU
a sponzoru - firmě ESSILOR


Děkujeme za podporu vedení LF MU
a sponzoru - firmě ESSILOR


visionimpactinstitute.org


269.000.000.000 $
...
visionimpact
essilor
Crizal®
Prožijte průzračný život
VARILUX®
Přirozené vidění. Navždy.
Xperio®
The polarized experience


visionimpactinstitute.org


essilor
Crizal


Ultraviolet (UV) are part of sunlight
ULTRAVIOLET
VISIBLE
INFRARED
400
740
wavelength (nm)
UVC
UVB
UVA
100
280
315
400
Crizal
essilor
Crizal
Welcome to
4th NATIONAL STUDENT
CONFERENCE OF OPTOMETRY
8mio, 17.10.2013
Thanks for support to LF MU
Sponsored by ESSILOR
essilor


Bc. Mandáková Vojtěška


VELEUČILIŠTE VELIKA GORICA


The Cathedral Group Ltd. - Cathedral Optical (Eye testing clinic)


Welcome to
essilor


Welcome to
TIONAL STUDENT
ERENCE OF OPTOMETRY


essilor
Crizal


Bc. Lenka Pivodová


short-wave cone
middle-wave cone
long-wave cone


essilor


toriální
Sférická aberace
Chromatická aberace
Rozložení světločivých elementů
Adaptace na tmu a Purkyňův jev
What is night myopia?


silor
izal
růzračný život
RILUX
vidění. Navždy.
perio
polarized experience
Transitions
nozabarvovací brýlové čočky


(kvantitativní nesouměrnost)
rozdíl v délce či objemu
funkční (kvalitativní nesouměrnost)
rozdíl ve výkonu, aktivitě či specializaci
dominance


quality of the


Tereza Ševčíková
Optika a optometrie
Dry Eye Syndrome


essilor
Crizal
Prožijte průzračný život
VARILUX
Přirozené vidění. Navždy.


Bc. Hana Holubová
Kladno 2013


anického čištění

Zpracování výsledků

- Způsob čištění kontaktních čoček
  - 60 % opláchnutí víceúčelovým roztokem
  - 32 % čistí mechanicky
  - 14 % používá peroxidový systém


To resolve this problem it is necessary switching to a more appropriate contact lens material or refitting with an RGP lens


I ♥ OPTIFOG


All layers of cornea affected
Keratoconus
Normal Cornea
Welcome to
Thanks for support to LF MU
Sponsored by ESSILOR
silor
izal
Transitions


essilor
Crizal
Prožijte průzračný život
VARILUX
Přirozené vidění. Navždy.
Xperio
The polarized experience


Pevné plynopropustné kontaktní čočky III.
• Design: sklerální, sklerokorneální, kornealní.
• Korekce: běžné refrakční vady
speciální refrakční vady:
nepravidelný astigmatismus, afakie, vysoká myopie,
vysoká hypermetropie, vysoký astigmatismus,
tendence k neovaskularizaci rohovky, alergie na
roztoky měkkých kontaktních čoček, syndrom
suchého oka.

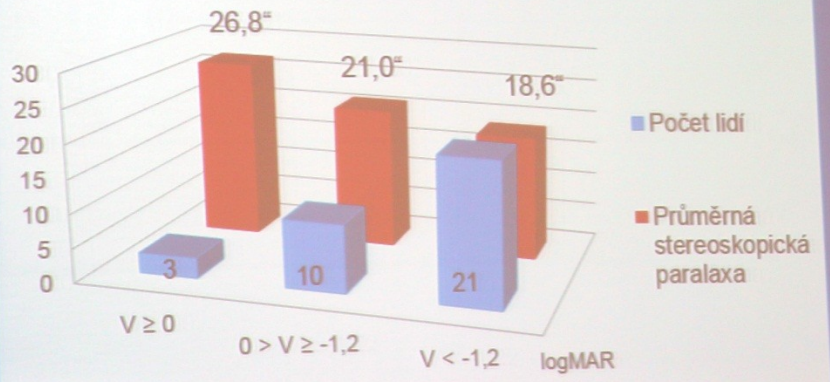

Superp

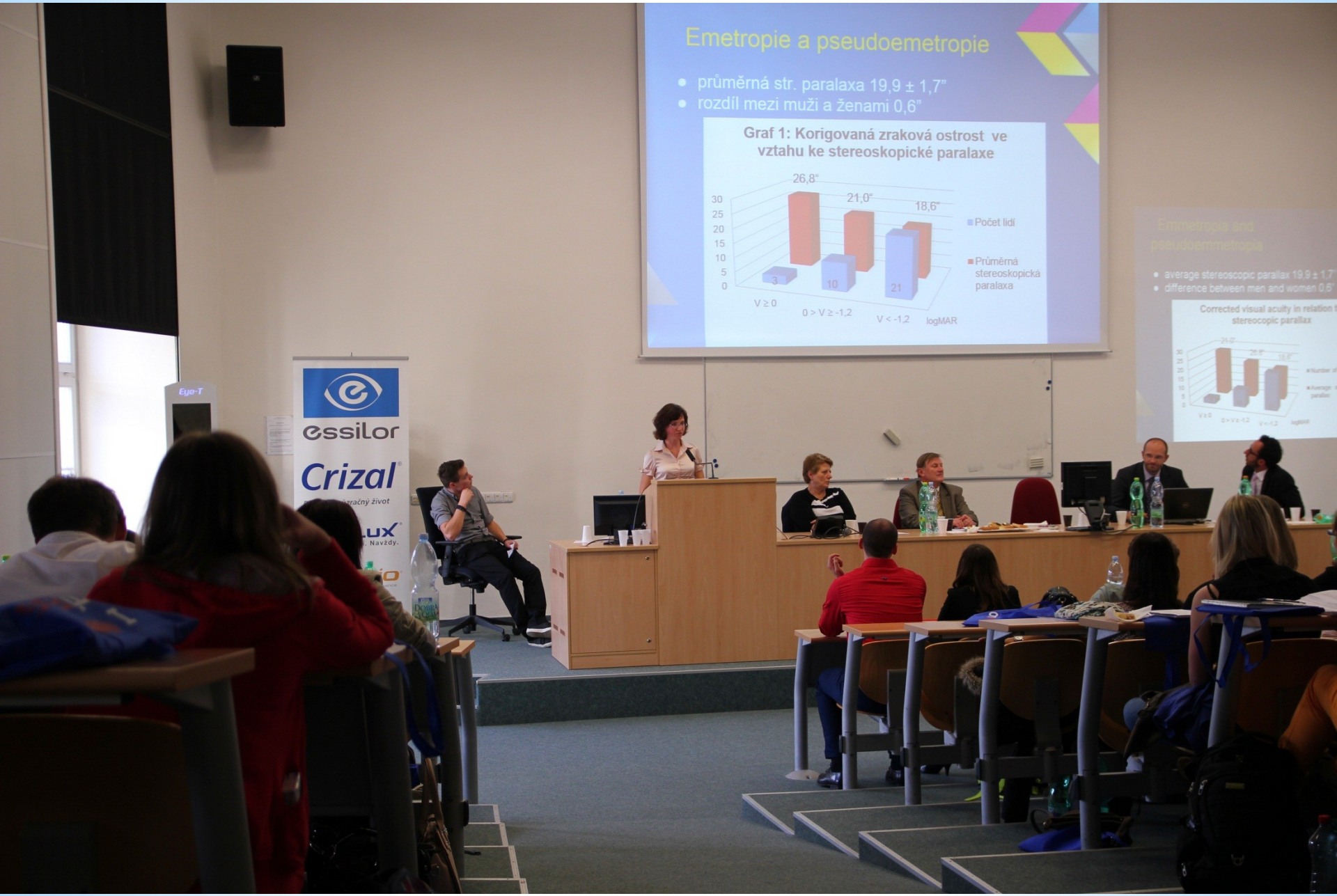

essilor
Crizal®

Emetropie a pseudoemetropie

- průměrná str. paralaxa 19,9 ± 1,7”
- rozdíl mezi muži a ženami 0,6”

Graf 1: Korigovaná zraková ostrost ve vztahu ke stereoskopické paralaxe




Emetropie a pseudoemetropie
průměrná str. paralaxa 19,9 ± 1,7"
rozdíl mezi muži a ženami 0,6"
Graf 1: Korigovaná zraková ostrost ve vztahu ke stereoskopické paralaxe
26,8"
21,0"
18,6"
30
25
20
15
10
5
0
3
10
21
V ≥ 0
0 > V ≥ -1,2
V < -1,2
logMAR
Počet lidí
Průměrná stereoskopická paralaxa
Emmetropia and pseudoemmetropia
average stereoscopic parallax 19.9 ± 1.7"
difference between men and women 0.6"
essilor
Crizal
Eye-T


lor
al®
ý život
ux®
Navždy.


CAUSES OF LEUKOCORIA IN
CHILDHOOD


Bc. Adéla Langrová
KOO LF MU Brno


co nejdříve diagnostikovat chorobu
zahájení správné léčby


co nejdříve
zahájení spr
essilor
Criza
Prožijte průzr
VARIL
Přirozené viděn


Kliknutím vložíte poznámky.
SNÍMEK 13 Z 13
ČEŠTINA


Kliknutím vložíte poznámky.
POZNÁMKY
KOMENTÁŘE
Welcome to
essilor


Kliknutím vložíte poznámky.
ČEŠTINA
POZNÁMKY
KOMENTÁŘE
Thank you
essilor


Kliknutím vložíte poznámky.
SNÍMEK 13 Z 13
ČEŠTINA

… přestávky…


E-VALTICE CULTURAL LANDSCAPE
Studenti
Km - Po

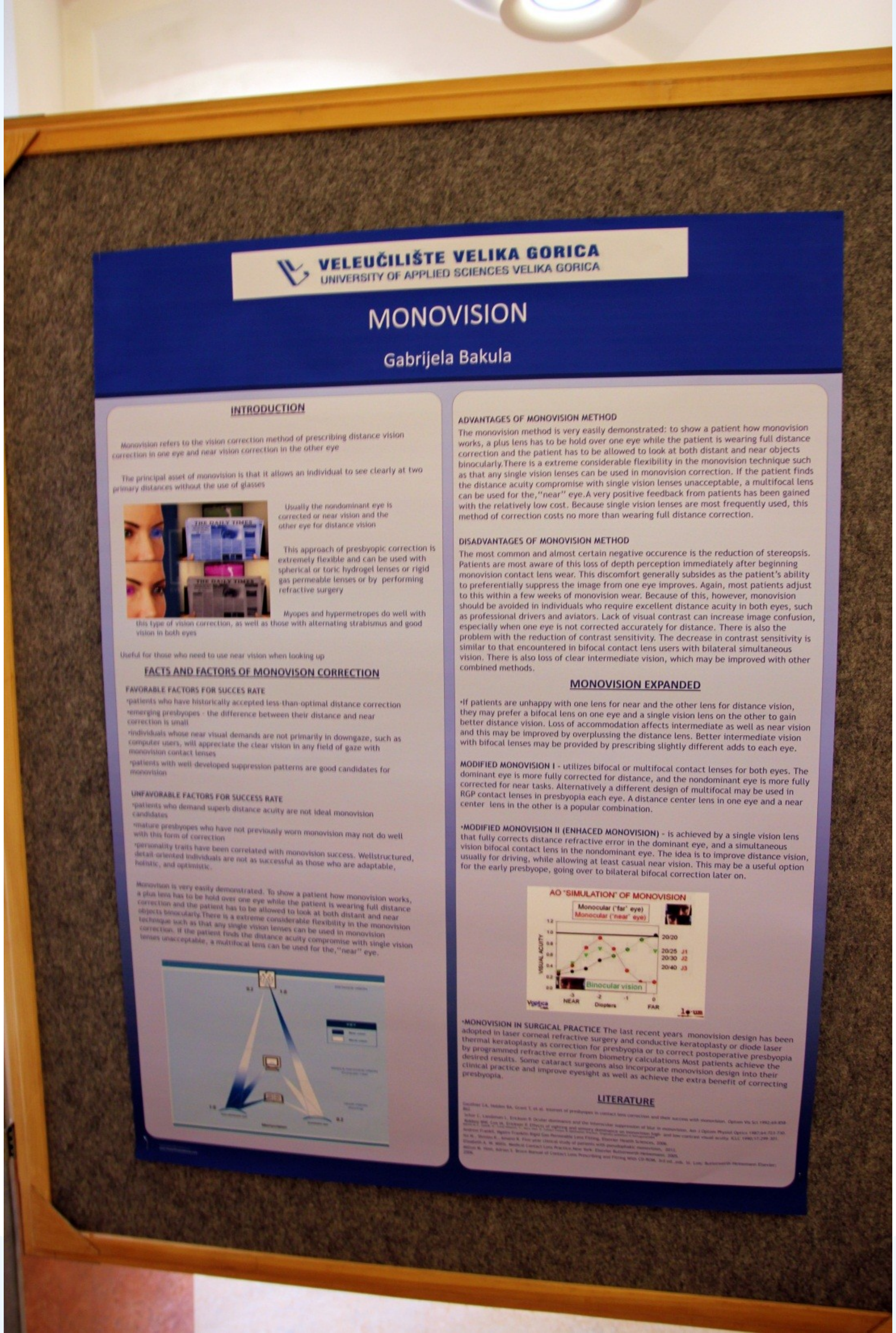

Dolce Chiara
DOBRÁ VODA


Vítáme Vás
4. CELOSTÁTNÍ STUDENTSKÁ KONFERENCE OPTOMETRIE
essilor


Vítáme Vás
4. CELOSTÁTNÍ STUDENTSKÁ KONFERENCE OPTOMETRIE
Brno, 17.10.2013
Děkujeme za podporu vedení LF MU a sponzorů - firmě ESSILOR.
essilor
essilor
Crizal
VARILUX
Xperio
Crizal Transitions

….. sekce posterů

…….

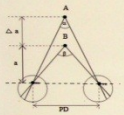

VELEUČILIŠTE VELIKA GORICA
UNIVERSITY OF APPLIED SCIENCES VELIKA GORICA
MONOVISION
Gabrijela Bakula
INTRODUCTION
Monovision refers to the vision correction method of prescribing distance vision correction in one eye and near vision correction in the other eye
The principal asset of monovision is that it allows an individual to see clearly at two primary distances without the use of glasses
Usually the nondominant eye is corrected or near vision and the other eye for distance vision
This approach of presbyopic correction is extremely flexible and can be used with spherical or toric hydrogel lenses or rigid gas permeable lenses or by performing refractive surgery
Myopes and hypermetropes do well with this type of vision correction, as well as those with alternating strabismus and good vision in both eyes
Useful for those who need to use near vision when looking up
FACTS AND FACTORS OF MONOVISON CORRECTION
FAVORABLE FACTORS FOR SUCCES RATE
UNFAVORABLE FACTORS FOR SUCCESS RATE
ADVANTAGES OF MONOVISION METHOD
The monovision method is very easily demonstrated: to show a patient how monovision works, a plus lens has to be hold over one eye while the patient is wearing full distance correction and the patient has to be allowed to look at both distant and near objects binocularly.There is a extreme considerable flexibility in the monovision technique such as that any single vision lenses can be used in monovision correction. If the patient finds the distance acuity compromise with single vision lenses unacceptable, a multifocal lens can be used for the "near" eye.A very positive feedback from patients has been gained with the relatively low cost. Because single vision lenses are most frequently used, this method of correction costs no more than wearing full distance correction.
DISADVANTAGES OF MONOVISION METHOD
The most common and almost certain negative occurence is the reduction of stereopsis. Patients are most aware of this loss of depth perception immediately after beginning monovision contact lens wear. This discomfort generally subsides as the patient's ability to preferentially suppress the image from one eye improves. Again, most patients adjust to this within a few weeks of monovision wear. Because of this, however, monovision should be avoided in individuals who require excellent distance acuity in both eyes, such as professional drivers and aviators. Lack of visual contrast can increase image confusion, especially when one eye is not corrected accurately for distance. There is also the problem with the reduction of contrast sensitivity. The decrease in contrast sensitivity is similar to that encountered in bifocal contact lens users with bilateral simultaneous vision. There is also loss of clear intermediate vision, which may be improved with other combined methods.
MONOVISION EXPANDED
•If patients are unhappy with one lens for near and the other lens for distance vision, they may prefer a bifocal lens on one eye and a single vision lens on the other to gain better distance vision. Loss of accommodation affects intermediate as well as near vision and this may be improved by overplussing the distance lens. Better intermediate vision with bifocal lenses may be provided by prescribing slightly different adds to each eye.
MODIFIED MONOVISION I - utilizes bifocal or multifocal contact lenses for both eyes. The dominant eye is more fully corrected for distance, and the nondominant eye is more fully corrected for near tasks. Alternatively a different design of multifocal may be used in RGP contact lenses in presbyopia each eye. A distance center lens in one eye and a near center lens in the other is a popular combination.
•MODIFIED MONOVISION II (ENHACED MONOVISION) - is achieved by a single vision lens that fully corrects distance refractive error in the dominant eye, and a simultaneous vision bifocal contact lens in the nondominant eye. The idea is to improve distance vision, usually for driving, while allowing at least casual near vision. This may be a useful option for the early presbyope, going over to bilateral bifocal correction later on.
AO "SIMULATION" OF MONOVISION
Monocular ("far" eye)
Monocular ("near" eye)
Binocular vision
NEAR
Diopters
FAR
•MONOVISION IN SURGICAL PRACTICE
LITERATURE

Refrakční vady a heteroforie ve vztahu ke stereopsi

Bc. Pavla Sochová, Mgr. Petr Veselý, DiS., Ph.D.
Katedra optometrie a ortoptiky
LF Masarykova univerzita

1 Úvod

V dnešní době se kladou stále vyšší a vyšší nároky na kvalitu vidění a to nejen na rozlišovací schopnost, ale i na prostorové vidění (stereopsi). Podílí se na ní jak binokulární podněty, dané lehkou horizontální disparitou sítnicových obrazů, tak i řada monokulárních stimulů.
Kritériem kvality prostorového vidění je ***úhel stereoskopické paralaxy***, který lze vypočítat jako rozdíl dvou úhlů, jenž spolu svírají osy očí při fixaci bodu A a B. Ty jsou od sebe vzdáleny o nejmenší vzdálenost rozeznávající jako hloubku.
Nejmenší možná hloubková ostrost se udává 2", při ní by člověk na 5 m dokázal rozeznat hloubku 4 mm. Avšak klinické testy většinou neprezentují tak malé hodnoty, proto se za dostatečné považuje 40".



Tato práce zkoumá možný vliv uměle navozených refrakčních vad a heteroforií na schopnost vnímat prostorově. Měření probíhala na katedře optometria a ortoptiky, vedoucí doc. MUDr. Svatopluk Synek, CSc.

2 Vyšetřovaný soubor

Vyšetřovaný soubor čítá 34 lidí, z toho 22 žen (65 %) a 12 mužů (35 %) ve věku 20 až 30 let. Průměrný věk byl 23,8 ± 0,5 let. Binokulární zraková ostrost s optimální korekcí V ≤ 0,18 LogMAR.

3 Metodika

1) Zjištění refrakčního stavu pomocí optotypů na vyšetřovací vzdálenost 6 m na polatestu.
2) Optimální korekce případné vady.
3) Předložení Random dot stereotestu při vyšetřovací vzdálenosti 40 cm s nasazenými polarizačními brýlemi.
4) Postupné navozování refrakční vady (myopie/ hypermetropie) nebo heteroforie (esoforie/ exoforie). Arteficiální myopie bylo dosaženo předřazováním spojných čoček před obě oči po krocích +0,5 D, hypermetropie byla simulována rozptylnými čočkami. Pomocí klínů rovnoměrně rozložených před obě oči s bází temporálně byla navozována esoforie, v případě exoforie tomu bylo naopak.
5) Zjišťování hodnot stereoskopické paralaxy při narůstající hodnotě arteficiální refrakční vady nebo heteroforie. Použitý test obsahoval trojice kružnic s monokulárními podněty ve dvanácti úrovních stereoskopické paralaxy od 12,5" do 400".
6) Orientační zjištění akomodační šíře u osob ve skupině hypermetropů pomocí push-up metody.

4 Výsledky

Emetropie a pseudoemetropie

Průměrná stereoskopická paralaxa u emetropů a vykorigovaných emetropů je **19,9 ± 1,7"**. Rozdíl v hodnotách mezi ženami a muži lze vyčíslit jako 0,66", což není klinicky významné.
V následující tabulce jsou vyšetřovaní rozdělení podle vizu s nejlepší korekcí (emetropové bez ní) v porovnání s dosaženou stereoskopickou paralaxou. Největší zastoupení (62 %) bylo ve skupině se zrakovou ostrostí lepší než -1,2 LogMAR, průměrně měli také nejkvalitnější prostorové vidění 18,6".

Vizus Log MAR	Počet subjektů	Počet subjektů/%	Průměrná stereoskopická paralaxa/"
V ≥ 0	3	9	26,8
0 < V ≥ -1,2	10	29	21,0
V < -1,2	21	62	18,6

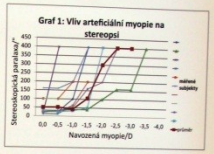
Myopie

Arteficiální myopie byla simulována u 10 subjektů (7 žen a 3 mužů). Při předložení +2,5 D je plně nahrazena akomodace oči potřebná na zaostření testu, od té chvíle se počítá skutečné navození myopie.

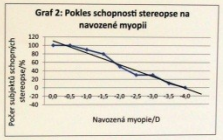
Postupně rostoucí myopie se u všech vyšetřovaných projevila větší stereoskopickou paralaxou, tudíž horší kvalitou prostorového vidění než při emetropii (pseudoemetropii). (graf 1)

Schopnost vnímat prostorově klesala s téměř lineární závislostí na myopii. Při krátkozrakosti -1,5 D nedokázalo vidět prostorově 20 % subjektů, jen o 0,5 D více jich bylo 50 %. Stereopse se při myopii -4,0 D *již* nebyla vyvolána. (graf 2)

Graf 1: Vliv arteficiální myopie na stereopsi



Graf 2: Pokles schopnosti stereopse na navozené myopii



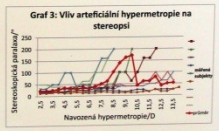
Hypermetropie

Arteficiální hypermetropie byla simulována u 9 subjektů (6 žen a 3 mužů). Tato vada vyvolává tendenci ji kompenzovat akomodací, hlavně u mladých lidí s dostatečnou akomodační šíří. Její průměrná hodnota u vyšetřovaných byla 9,5 ± 0,6 D. Akomodace je částečně zapojena pro zaostření testu na vyšetřovací vzdálenost 40 cm .

Hodnoty steroskopické paralaxy na narůstající hypermetropii byly velmi individuální s tendencí ke kolísání. Průměrné výsledky jsou vyznačeny červeně. (graf 3)

Při hypermetropii +8,0 D dokázali všichni vyšetřovaní vidět prostorově, dalším navazováním jich ubývalo. Při +10,5 D mělo stereopsi 56 % z nich a tento ubývající trend dále pokračoval. (graf 4)

Graf 3: Vliv arteficiální hypermetropie na stereopsi



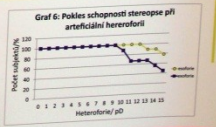
Graf 4: Pokles schopnosti stereopse na navozené hypermetropii

Heteroforie

Esoforie byla navozována u 9 vyšetřovaných (6 žen a 3 mužů), stejně tak i exoforie. Průměrné hodnoty stereoskopických paralax v obou případech kolísají. V případě esoforie do 10 pD v rozmezí 20 až 50", u exoforie je stejné rozmezí až do 11 pD. (graf 5)

Při esoforii 12 pD dokázali všichni vyšetřovaní rozlišovat prostor, jen 22 % z nich tuto schopnost ztratili při simulaci 15 pD. Naopak exoforie ovlivňovala stereopsi více, což se projevilo její rychlejší ztrátou. Při 10 pD správně viděla prostor 87 % subjektů, ale při 15 pD už jen 45 %.

Graf 6: Pokles schopnosti stereopse při arteficiální hereroforii



Graf 5: Porovnání vlivu esoforie a exoforie na stereopsi

5 Závěr

Mladí lidé z vyšetřovaného souboru mají velmi dobré prostorové vidění průměrně **19,9 ± 1,7"**. Potvrzuje se pravidlo, že čím lepší je zraková ostrost, tím kvalitnější hloubkové vidění.
Navozováním myopie se významě zhoršovala kvalita prostorového vidění s téměř lineární závislostí až do hodnoty -4,0 D, velmi viděný s téměř lineární závislostí až do hodnoty -4,0 D, kdy již nebyla vyšetřena. Arteficiální hypermetropie do +8,0 D způsobovala kolísání stereoskopické paralaxy od 12,5 do 63". Při vyšších hodnotách postupně ubývalo subjektů se schopností stereopse.
Simulace nižších heteroforií nemá takový vliv na snímání prostoru jako navozené refrakční vady. U arteficiální esoforie se tento schopnost ztrácela ve vyšších hodnotách než u exoforie.

6 Poděkování
Díky patří Mgr. Petru Veselému, DiS., Ph.D. a všem dobrovolníkům. Práce je součástí projektu Masarykovy univerzity Podpora studentských projektů MUNI/C/0776/2012).

VELEUČILIŠTE VELIKA GORICA
UNIVERSITY OF APPLIED SCIENCES VELIKA GORICA

SOFT CONTACT LENSES FOR ASTIGMATISM

Brekalo Ivana

Introduction

Astigmatism is a vision condition that causes blurred vision due either to the irregular shape of the cornea, the clear front cover of the eye, or sometimes the curvature of the lens inside the eye. An irregular shaped cornea or lens prevents light from focusing properly on the retina, the light sensitive surface at the back of the eye. As a result, vision becomes blurred at any distance.

Soft contact lenses for astigmatism are made from the same materials as regular ("spherical") contact lenses, the difference is in the design of the lens.

Toric lenses have two powers in them, created with curvatures at different angles (one for astigmatism, the other for either myopia or hyperopia).

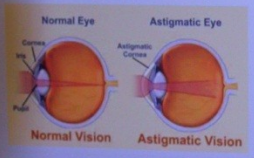
Gas permeable contact lenses retain their shape on the cornea better than soft lenses and tend to provide sharper vision than soft toric lenses.

This degree of difference in visual clarity may not be noticed by some contact lens wearers, but if you're particularly fussy about your vision, you are likely to appreciate it.

Still, most people who need astigmatism correction choose soft toric lenses instead of gas permeable lenses because of the immediate comfort of soft lenses.

Astigmatism

Astigmatism is an eye condition which main symptom is blurred vision. It is a refractive error that prevents sufferers from seeing objects clearly from a distance or up close. Astigmatism may occur in varying degrees in each eye and can accompany myopia or hyperopia. Mild astigmatism is usually not noticeable, or causes only slight blurriness, while severe astigmatism causes objects to appear blurry at any distance.



A person with astigmatism does not have properly curved front surface of the eye, which is called cornea. The curve in astigmatism is irregular. A normal cornea is shaped like a perfect sphere. The eye's natural lens is also curved in equal degree in all directions. The corneas or lenses of people with astigmatism do not have equal curves. One side may be steeper than the other, making the cornea look more like a football than a basketball . Because of this, light entering the eye is not focused correctly on the retina, resulting in a blurred image.

This optical distortion is most often caused when the cornea has a toric shape. The torus has the shape of a bicycle tire and is more curved in one meridian than the other.

Types of astigmatism

Myopic astigmatism: One or both principal meridians of the eye are nearsighted

Hyperopic astigmatism: One or both principal meridians of the eye are farsighted

Mixed astigmatism: One principal meridian is nearsighted while the other is farsighted

Astigmatism can also be classified as either regular or irregular. Regular astigmatisms are more common and they give the cornea its football shape. The principal meridians are 90 degrees apart and perpendicular to each other. Irregular astigmatism can appear after certain types of eye surgery, or it can be caused by an eye injury or by the condition known as keratoconus. In cases of irregular astigmatism, the principal meridians are not perpendicular to each other.

Astigmatism symptoms

In mild cases of astigmatism, symptoms are hardly noticeable. In fact, treatment may not be needed. In more severe cases, astigmatism makes it difficult to see fine details, either up close or far away. Astigmatism generally does not cause symptoms such as eye pain, watery eyes, or eye redness. People with severe astigmatism may suffer from headaches, eye fatigue, and fluctuating vision, especially while reading a book, staring at a computer screen, or looking off into the distance.

Soft contact lenses for astigmatism

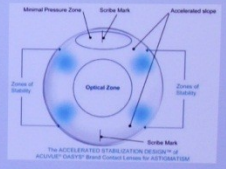
The first disposable toric lenses were introduced in 2000 by Vistakon.

There are many various versions of soft lenses for astigmatism on the market. For example, we have one-day, two-weekly, and monthly, as well as lenses for astigmatism in color. Depending on your preferences and needs, soft contact lenses for astigmatism have the ability to change color or increas the intensity of the eye color.

Toric soft contact lenses can provide better initial comfort and less risk of lens ejection compared to rigid lenses. However, lens rotation and instability can reduce the quality of vision with these lenses compared to rigid lenses.

Toric hydrophilic lenses are most successful for astigmatism between 1.00 and 3.00 D when the correcting cylinder is oriented at either 90 or 180 degree. Conventional hydrophilic toric contact lenses for the correction of high astigmatism and disposable toric hydrophilic contact lenses for the correction of low and moderate degrees of astigmatism are available.

Toric contact lenses may not be necessary for astigmatism less than 0.75 D. Small amounts of astigmatism can often be neutralized by spherical hydrophilic contact lenses. Thicker lenses, stiffer hydrophilic lens materials, or aspheric optic designs can mask small amounts of astigmatism.



Soft toric contact lenses are stabilized and kept from rotating on the eye by prism ballast or by tapered thin zones. The most common soft toric lens type is a back surface toric with prism ballast stabilization. Lens orientation is indicated by marks placed on the lens by the manufacturer. These marks or guides are most often located at the 6 o'clock position; however, some manufacturers place these marks in the 3 o'clock and 9 o'clock positions. The rotation of these marks quantifies the magnitude of lens rotation on the eye. Both conventional and disposable hydrophilic toric lenses are available for either daily or prolonged use. The most common markings are show below

Conclusion

Astigmatism is a condition which causes difficulties to people in everyday life.

If a good refraction test is made and a correct diagnosis is established, you can help people whether they wear glasses or contact lenses for astigmatism.

In many cases the ideal solution are soft lenses, but in some cases this is not possible, and they choose between glasses and hard contact lenses. Lack of soft lenses for astgmatism is their price in the market and because of them not everyone can afford one. Fortunately people have a choice between lenses and glasses.

Literature

http://www.eyehealthweb.com/astigmatism/
http://www.ncbi.nlm.nih.gov/pubmed
http://www.optometrija.net/kontaktne-lece/lece-za-astigmatizam/
http://www.beautytots.com/astigmatism-causes-symptoms-diagnosis-correction-best-colored-contact-lenses-for-astigmatism-what-is-treatment/
http://www.aoa.org/patients-and-public/eye-and-vision-problems/glossary-of-eye-and-vision-conditions/astigmatism
Medical contact lense practice, Elisabeth A.W.Millis
Contact Lenses in Ophthalmic Practice, Mark J. Mannis, Karla Zadnik, Cleusa Coral-Ghanem, Newton Kara-Jose

VELEUČILIŠTE VELIKA GORICA
UNIVERSITY OF APPLIED SCIENCES VELIKA GORICA

RIGID EXTENDED WEAR AND COMPLICATIONS

Biljana Trajčova

Rigid gas-permeable (RGP) extended wear

Rigid gas-permeable (RGP) extended wear is healthier than soft extended wear and has high success rates. During overnight wear, corneal coverage is less, tear exchange is greater (due to rapid eye movement), and materials are more permeable than those of soft lenses. Although materials are less then optimal, normal tear pumping reduces overnight swelling more rapidly than soft extended wear. Complications are fewer and less severe than soft lenses. Rigid lenses require less replacement, cost less, produce more stable vision, are easier to care for, are available in custom lens designs, and can be modified. In past, much of the early work was performed with aphasics. Currently, most rigid extended-wear lenses are fitted for myopes and hyperopes.

A number of issues pertaining to lens design and fitting must be taken into account.

Client selection for rigid extended wear is similar to that for daily wear, with some special concerns. Astigmatic clients who fail with soft lenses because of visual acuity are ideal candidates. Aphakic clients are also good candidates. When examination and history reveal the presence of coalesced staining areas, gpc; chronic injection; or use of antihistamines, diuretics, or tranquilizers, the client is a poor candidate for rigid extended wear. Systemic conditions related to poor wound healing (diabetes) and immunosupression should be also ruled out. Special attention should be paid to dry-eye concerns because of adhesion risk. Conditions related to staphylococcal keratitis (blepharitis, meibomian gland dysfunction) should be treated prior to rigid extended contact lens wear. Other conditions affecting topography (pterygia and pinguecula) may predispose the client to peripheral corneal desiccation.

Fitting of rigid extended wear lenses

Fitting of rigid extended wear lenses follows many of the same guidelines as are used for daily wear. A successful daily wear may cause problems as an extended-wear lens, however. Close attention must be paid to edge lift and peripheral systems.

The recommended diameter and base curve relationship vary with authors. Diameters of approximately 9 mm with alignment to slight apical clearance (flat K to 0.50 D steeper than K) are effective. Overly large diameters and flat lens fitting should be avoided because of adhesion. There should be 1-2 mm of blink -induced movement.

Edge lift is an important feature because of peripheral corneal desiccation. An ideal 0,4 - 0.5 mm wide band of fluorescein at the edge should be seen when fitting. Width is more critical than depth in rigid extended wear.

Flexure is common with the higher- Dk materials. Fitting seats made of the same material as the ordered lens are recommended because of property differences.

Material selection is largely influenced by oxygen permeability. The highest level of permeability is desirable. Fluor silicone acrylates are currently the most widely used for rigid extended wear.

The boundary layer effect makes the effective Dk on the eye around half of the nominal Dk. Since a Dk of 75 is needed as the ideal minimum for manageable overnight swelling, an absolute minimum Dk/t of 30 is necessary for extended wear.

A general guideline for rigid extended wear is to have Dks of 60-100 for resolving overnight swelling within 1-2 hours of eye opening (a higher Dk is required to resolve overnight swelling faster but lenses with these Dks are not made with satisfactory performance). Dks of 50-60 may be adequate for occasional overnight wear. Extended wear on a regular basis requires a Dk of more than 90.

Client education and management

Client education and management to ensure safe and comfortable wear is important. The wearing schedule recommended by the Food and drug Administration is a maximum of 7 days and 6 nights. The lenses should be removed at least 1 night. Before commencing extended wear, the client should be on daily- wear schedule. One month of daily -wear success is strongly advised before the client proceeds with overnight wear.

The follow-up schedule when extended wear is initiated includes an early morning visit within 2 hours of awakening during the first week of overnight wear. Conditions such as lens adhesion and edema are best viewed shortly after awakening. Other follow-ups are at 1 week, 1 month, and 3 months for non-problematic clients. Subsequent visits at 3-month intervals are advised on a regular basis. Care systems are similar to those used with rigid wear .Lenses should be disinfeed and cleaned the evenings they are not worn.

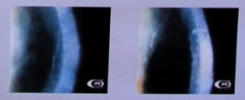
High- viscosity solutions can prolonged blurring in the morning, producing a so-called ointment like effect, and they are not recommended. Rewetting drops are important to use before sleep and on awakening. The drops rinse trapped debris and enhance lens movement.

Complications of rigid extended wear usually related to corneal hypoxia or mechanical trauma. Many of the complications are the same as those seen in soft extended wear, although they usually occur at a reduced rate. There is an especially low occurrence of infiltrates with RGP extended wear. The better tear flushing, smaller corneal coverage, and reduced lens contamination contribute to a healthier extended-wear lens.

Microcyst

Microcyst are irregular refractile lesions of 15-20 um that usually exhibit reversed illumination. Microcysts originate at the basement membrane and migrate forward to the epithelium, sometimes breaking through and staining. They take 3-4 months to clear and can temporarily increase after discontinuation of lens wear. Negative staining sometimes appear's at elevated areas where microcysts are preparing to break through. Microcysts numbering 50 or more indicate cessation of extended wear or a material change. Vacuoles are often present, showing unreversed illumination.

Striae and folds appear when there is corneal swelling due to edema. Striae are fine, gray-white vertical lines in the stroma seen at 5-6 % corneal swelling. Folds appear at 10-12% swelling and appear as dark lines in the posterior stroma. Striae have been noted less frequently with rigid lenses than soft lenses despite similar amounts of swelling. If striae or folds appear, overnight wear should be reduced and change in material made.



Polymegethism and pleomorphism in minimal increases have been reported with high-Dk RGP lenses. The consequences of polymegethism and pleomorphism are unclear.

REFERENCES

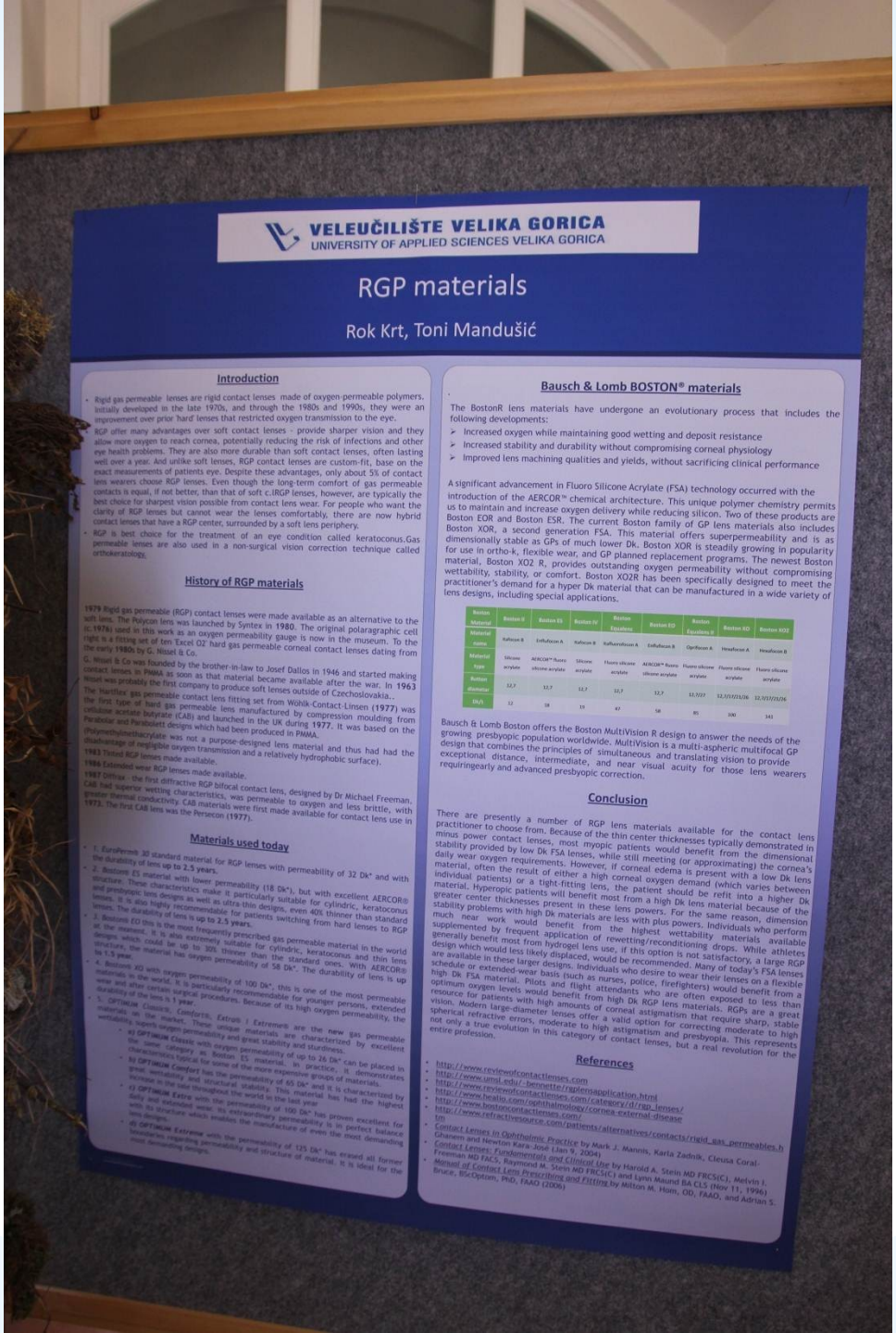
Bennett ES. RGP extended wear; a modality for the future? CL Forum 1987; 13(5):27-41

Lowther GE. High- versus low -Dk RGP materials for daily wear. ICLC 1987; 14(5):174

Grohe RM, Lebow KA. Vascularized limbal keratitis. ICLC 1989; 16(7-8):197-209

Benjamin WJ, Boltz RL. RGP lens adhesion is not a benig phenomenom. ICLC 1989; 16(2):60-62.

Osborn GN, Andrasko GJ, Barr JT. Rgp lenses daily wear vs. Extended wear. CL Spectrum 1986; 1(4):32-49.



VELEUČILIŠTE VELIKA GORICA
UNIVERSITY OF APPLIED SCIENCES VELIKA GORICA

RGP materials

Rok Krt, Toni Mandušić

Introduction

- Rigid gas permeable lenses are rigid contact lenses made of oxygen-permeable polymers. Initially developed in the late 1970s, and through the 1980s and 1990s, they were an improvement over prior 'hard' lenses that restricted oxygen transmission to the eye.

RGP offer many advantages over soft contact lenses - provide sharper vision and they allow more oxygen to reach cornea, potentially reducing the risk of infections and other eye health problems. They are also more durable than soft contact lenses, often lasting well over a year. And unlike soft lenses, RGP contact lenses are custom-fit, base on the exact measurements of patients eye. Despite these advantages, only about 5% of contact lens wearers choose RGP lenses. Even though the long-term comfort of gas permeable contacts is equal, if not better, than that of soft c.tRGP lenses, however, are typically the best choice for sharpest vision possible from contact lens wear. For people who want the clarity of RGP lenses but cannot wear the lenses comfortably, there are now hybrid contact lenses that have a RGP center, surrounded by a soft lens periphery.

- RGP is best choice for the treatment of an eye condition called keratoconus.Gas permeable lenses are also used in a non-surgical vision correction technique called orthokeratology.

History of RGP materials

1979 Rigid gas permeable (RGP) contact lenses were made available as an alternative to the soft lens. The Polycon lens was launched by Syntex in **1980**. The original polaragraphic cell (c.**1976**) used in this work as an oxygen permeability gauge is now in the museum. To the right is a fitting set of ten Excel OZ hard gas permeable corneal contact lenses dating from the early **1980**s by G. Nissel & Co.

G. Nissel & Co was founded by the brother-in-law to Josef Dallos in 1946 and started making contact lenses in **PMMA** as soon as that material became available after the war. In **1963** Nissel was probably the first company to produce soft lenses outside of Czechoslovakia..

The 'Hartflex' gas permeable contact lens fitting set from Wöhlk-Contact-Linsen (**1977**) was the first type of hard gas permeable lens manufactured by compression moulding from cellulose acetate butyrate (CAB) and launched in the UK during **1977**. It was based on the Parabolar and Parabolett designs which had been produced in PMMA.

(Polymethylmethacrylate was not a purpose-designed lens material and thus had had the disadvantage of negligible oxygen transmission and a relatively hydrophobic surface).

1983 Tinted RGP lenses made available.

1986 Extended wear RGP lenses made available.

1987 Diffrax - the first diffractive RGP bifocal contact lens, designed by Dr Michael Freeman.

CAB had superior wetting characteristics, was permeable to oxygen and less brittle, with greater thermal conductivity. CAB materials were first made available for contact lens use in **1973**. The first CAB lens was the Persecon (**1977**).

Materials used today

- 1: EuroPerm® 30 standard material for RGP lenses with permeability of 32 Dk* and with the durability of lens **up to 2.5 years**.
- 2: Boston® ES material with lower permeability (18 Dk*), but with excellent AERCOR® structure. These characteristics make it particularly suitable for cylindric, keratoconus and presbyopic lens designs as well as ultra-thin designs, even 40% thinner than standard lenses. It is also highly recommendable for patients switching from hard lenses to RGP lenses. The durability of lens is **up to 2.5 years**.
- 3: Boston® EO this is the most frequently prescribed gas permeable material in the world at the moment. It is also extremely suitable for cylindric, keratoconus and thin lens designs which could be up to 30% thinner than the standard ones. With AERCOR® structure, the material has oxygen permeability of 58 Dk*. The durability of lens is up to 1.5 **year**.
- 4: Boston® XO with oxygen permeability of 100 Dk*, this is one of the most permeable materials in the world. It is particularly recommendable for younger persons, extended wear and after certain surgical procedures. Because of its high oxygen permeability, the durability of the lens is **1 year**.
- 5: OPTIMUM Classics, Comfortis, Extrusi ı Extremes are the **new** gas permeable materials on the market. These unique materials are characterized by excellent wettability & superb oxygen permeability and great stability and sturdiness.
  - a) **OPTIMUM Classic** with oxygen permeability of up to 26 Dk* can be placed in the same category as Boston ES material. In practice, it demonstrates characteristics typical for some of the more expensive groups of materials.
  - b) **OPTIMUM Comfort** has the permeability of 65 Dk* and it is characterized by great wettability and structural stability. This material has had the highest increase in the user throughout the world in the last year.
  - c) **OPTIMUM Extra** with the permeability of 100 Dk* has proven excellent for daily and extended wear. Its extraordinary permeability is in perfect balance with its structure which enables the manufacture of even the most demanding lens designs.
  - d) **OPTIMUM Extreme** with the permeability of 125 Dk* has erased all former boundaries regarding permeability and structure of material. It is ideal for the most demanding designs.

Bausch & Lomb BOSTON® materials

The BostonR lens materials have undergone an evolutionary process that includes the following developments:

- Increased oxygen while maintaining good wetting and deposit resistance
- Increased stability and durability without compromising corneal physiology
- Improved lens machining qualities and yields, without sacrificing clinical performance

A significant advancement in Fluoro Silicone Acrylate (FSA) technology occurred with the introduction of the AERCOR™ chemical architecture. This unique polymer chemistry permits us to maintain and increase oxygen delivery while reducing silicon. Two of these products are Boston EOR and Boston ESR. The current Boston family of GP lens materials also includes Boston XOR, a second generation FSA. This material offers superpermeability and is as dimensionally stable as GPs of much lower Dk. Boston XOR is steadily growing in popularity for use in ortho-k, flexible wear, and GP planned replacement programs. The newest Boston material, Boston XO2 R, provides outstanding oxygen permeability without compromising wettability, stability, or comfort. Boston XO2R has been specifically designed to meet the practitioner's demand for a hyper Dk material that can be manufactured in a wide variety of lens designs, including special applications.

Boston Material	Boston II	Boston ES	Boston IV	Boston Equalens	Boston EO	Boston Equalens II	Boston XO	Boston XO2
Material name	Balocon B	Enflufocon A	Balocon B	Balfluorfocon A	Enflufocon B	Optifocon A	Hexafocon A	Hexafocon B
Material type	Silicone acrylate	AERCOR™ fluoro silicone acrylate	Silicone acrylate	Fluoro silicone acrylate	AERCOR™ fluoro silicone acrylate	Fluoro silicone acrylate	Fluoro silicone acrylate	Fluoro silicone acrylate
Button diameter	12,7	12,7	12,7	12,7	12,7	12,7/77	12,7/17/21/26	12,7/17/21/26
Dk/t	12	18	19	47	58	85	100	141

Bausch & Lomb Boston offers the Boston MultiVision R design to answer the needs of the growing presbyopic population worldwide. MultiVision is a multi-aspheric multifocal GP design that combines the principles of simultaneous and translating vision to provide exceptional distance, intermediate, and near visual acuity for those lens wearers requiringearly and advanced presbyopic correction.

Conclusion

There are presently a number of RGP lens materials available for the contact lens practitioner to choose from. Because of the thin center thicknesses typically demonstrated in minus power contact lenses, most myopic patients would benefit from the dimensional stability provided by low Dk FSA lenses, while still meeting (or approximating) the cornea's daily wear oxygen requirements. However, if corneal edema is present with a low Dk lens material, often the result of either a high corneal oxygen demand (which varies between individual patients) or a tight-fitting lens, the patient should be refit into a higher Dk material. Hyperopic patients will benefit most from a high Dk lens material because of the greater center thicknesses present in these lens powers. For the same reason, dimension stability problems with high Dk materials are less with plus powers. Individuals who perform much near work would benefit from the highest wettability materials available supplemented by frequent application of rewetting/reconditioning drops. While athletes generally benefit most from hydrogel lens use, if this option is not satisfactory, a large RGP design which would less likely displaced, would be recommended. Many of today's FSA lenses are available in these larger designs. Individuals who desire to wear their lenses on a flexible schedule or extended-wear basis (such as nurses, police, firefighters) would benefit from a high Dk FSA material. Pilots and flight attendants who are often exposed to less than optimum oxygen levels would benefit from high Dk RGP lens materials. RGPs are a great resource for patients with high amounts of corneal astigmatism that require sharp, stable vision. Modern large-diameter lenses offer a valid option for correcting moderate to high spherical refractive errors, moderate to high astigmatism and presbyopia. This represents not only a true evolution in this category of contact lenses, but a real revolution for the entire profession.

References

- http://www.reviewofcontactlenses.com
- http://www.umsl.edu/~bennettes/rgplensapplication.html
- http://www.reviewofcontactlenses.com/category/d/rigp_lenses/
- http://www.healio.com/ophthalmology/cornea-external-disease
- http://www.bostoncontactlenses.com/
- http://www.refractivesource.com/patients/alternatives/contacts/rigid_gas_permeables.htm
- *Contact Lenses in Ophthalmic Practice* by Mark J. Mannis, Karla Zadnik, Cleusa Coral-Ghanem and Newton Kara-José (Jan 9, 2004)
- *Contact Lenses: Fundamentals and Clinical Use* by Harold A. Stein MD FRCS(C), Melvin I. Freeman MD FACS, Raymond M. Stein MD FRCS(C) and Lynn Maund BA CLS (Nov 11, 1996)
- *Manual of Contact Lens Prescribing and Fitting* by Milton M. Hom, OD, FAAO, and Adrian S. Bruce, BSc(Optom, PhD, FAAO (2006)

VELEUČILIŠTE VELIKA GORICA
UNIVERSITY OF APPLIED SCIENCES VELIKA GORICA

GAS-PERMEABLE LENS FITTING AND EYELID GEOMETRY

Biljana Trajčova

Hallmarks of a good RGP lens

The hallmarks of a good RGP lens fit are lens-cornea alignment, good centration and comfort. A well -centered lens is important from both an optical and a comfort point of view, as well as to minimize corneal distortion.

RGP Lens centration-client factors overview.
While the optimal fluorescein pattern may be achieved by considering RGP lens base curves in relation to the keratometry readings, the lens centration is assisted by a number of important patient factors.

1.Upper and lower lid positions (stabilizes lens, reduces sensation)
2.Tighter lid tension (gauge by difficulty of eversion). An example is the Asian eye
3.WTR astigmatism better than ATR (lens doesn't decenter laterally)
4.Steeper cornea >45 D (more posterior center of gravity)
5.Minus Rx (more posterior center of gravity)
6.Lower Rx (less lens weight)
7.Avoid front surface torics (similar corneal and refractive astigmatism)

Optimal lens centration and comfort

Of these factors, this section will concentrate on the effects of lid position and lens diameter on optimal lens centration and comfort.

Diameter and BOZR can be varied together in a „fitting philosophy". Varying the edge design and in some cases putting on a minus carrier can assist too. The two common fitting philosophies are „interpalpebral fitting" and „lid attachment".

Interpalpebral „fitting the cornea"- smaller diameter (e.g., 8.0-8.8) well centered with apical clearance (1/3 steeper than flat K, or 0.3 mm). For interpalpebral fit lens diameter < vertical lid aperture less 0.20 mm. Good for steeper corneas, minus Rx, high upper lid.
Lid attachment: „fitting the lids"- lens larger diameter (8.8-9.6 mm or larger) and flatter (0.25 mm flatter then flat K); possibly lenticular. Thinner edge, more edge lift for more superior movement. Lid attachment is good for lower positioned tighter lid, flatter corneas, and minus Rx or carrier.

Alignment: moderate lens diameter (e.g., 8.-9.2 mm), lens aligned with flat K. This philosophy could be considered to be a combination of interpalpebral and lid attachment. The choice of which fitting philosophy to use is based on lid geometry. If either the upper or lower lid hits the lens edge during a blink, then lens comfort will be reduced.

This is particularly during the initial adaptation period of 1-2 weeks. (Avoid lens edge proximity to lid margin for best comfort).

Try to have the lid either 1 mm or so away from the lens edge, or have the lid overlap the lens edge by a similar amount.

Good comfort is affected by the lens to lid relationships. Upper lid that overlaps the lens and does not hit the edge with each blink is usually comfortable.

An area of clearance or a gap between the lower lid and lens edge also is a good sign to look for with a comfortable lens.

Poor comfort is also affected by the lens to lid relationships. Upper lid that does not overlap the lens and hits the edge with each blink is usually not comfortable. Lower lid and lens edge bumping up against each other as the lens drops can indicate an uncomfortable lens.

Good comfort case

This case shows a first time wearer who experienced good comfort soon after the delivery.

Lens Parameters

BOZR	7.4/8.0
TD	10.0 mm
BVP	-4.50/-1.00
OZ	8.0 mm
Edge	+0.8 (.6)
	+1.5 (.4)

Bitoric Tricurve

Bitoric Tricurve design in Boston ES made bay Australian Contact Lenses (Melbourne). History is a 16-year -old female wearing lenses for the first time. Comfort was good after the first few days and client was happy with lenses. Spectacle RX was -0.75/-4.50 x 180. Fluorescein pattern was near alignment with good edge lift. Strong lid attachment and the inferior edge did not impact the lower lid. Normal speed movie shows the fit looks good and there appears to be minimal interaction with the lower lid. Slow motion movie shows the interaction with the lower lid is clearly visible. In assessing lid geometry both the upper and lower lid positions can be simply evaluated in relation to the adjacent corneal limbus when the eye is in primary gaze.

Superior lid covers the limbus slightly (about 1 mm); the positioning would be considered normal or low. If the superior lid is at the upper limbus or above it, it would be „high". Inferior lid assessment is the converse. If the lid margin is adjacent to or below the limbus it would probably be considered normal or low. If the limbus is significantly covered by the inferior lid, then the lid position is high. Eyelid geometry can be thought of in four possible combinations: narrow, ideal, unusual, and wide aperture. Lid geometry -choice of lens diameter is to fit a larger diameter (9.2 mm or larger). Upper lid interaction should be obtained where there is a low or normally positioned upper lid. If the lower lid is also in the normal or lower position, the largest diameter lens is possible in terms of both comfort and centration.

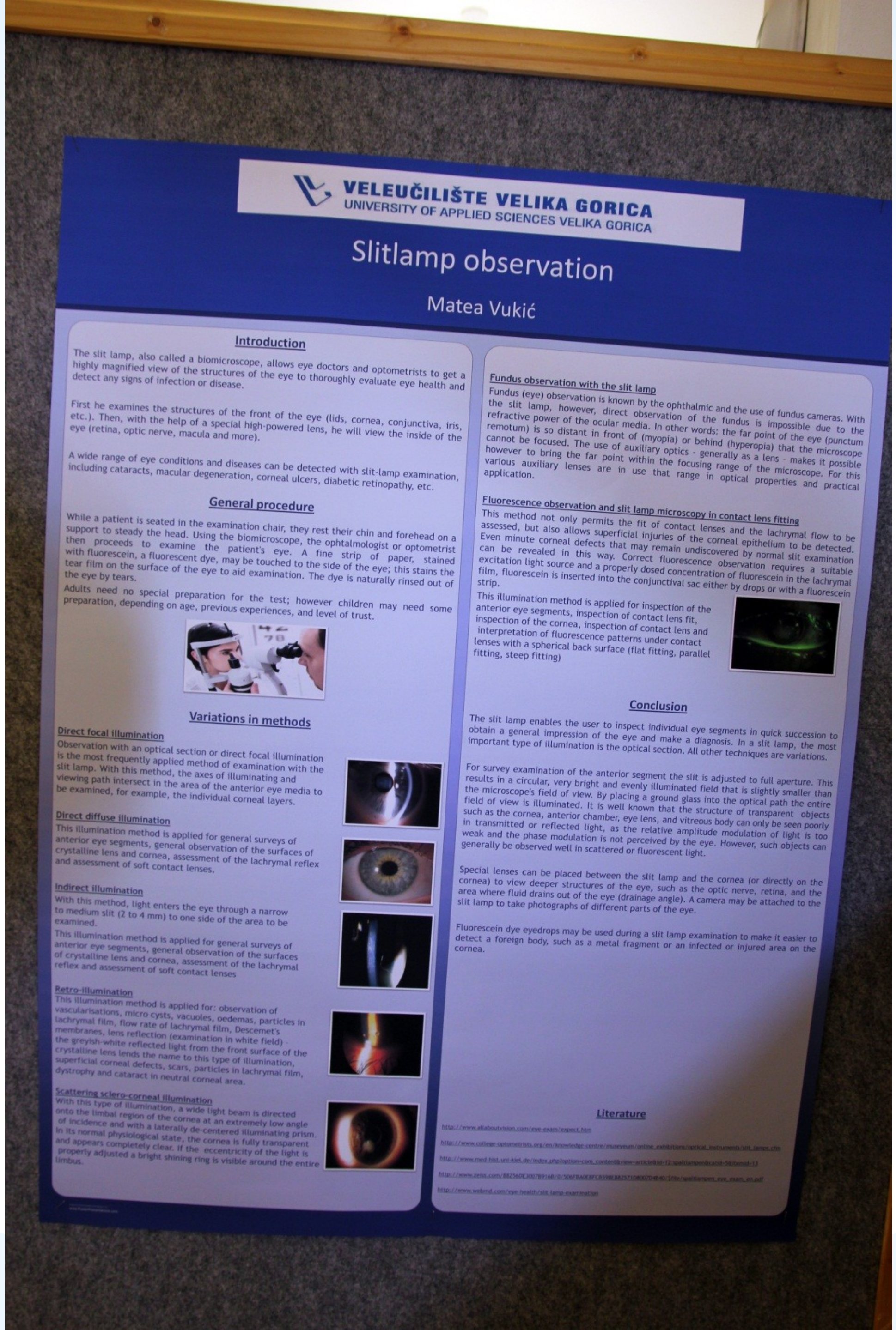
1.Use larger lenses for lid attachment.
2.Flatten base curve in association with larger diameter.
3.Use lenticular lenses.

Use smaller lenses for narrow lid aperture and to reduce weight if lid attachment is not possible. Possible complication of inferior lens centration is desiccation staining. Possible complication of superior lens centration is corneal distortion.

REFERENCES

Bennett ES. Lens design, fitting and troubleshooting. In ES Bennett, RM Grohe (eds). Rigid Gas-Permeable Contact Lenses. New York: professional Press, 1986; 189-220.

Phillips AJ. Rigid gas-permeble corneal lens fitting. In AJ Phillips, L Speedwell (eds.) Contact Lenses, Fourth Edition, London: Butterworth-Heinemann, 1997; 313-357.


VELEUČILIŠTE VELIKA GORICA
UNIVERSITY OF APPLIED SCIENCES VELIKA GORICA
Slitlamp observation
Matea Vukić
Introduction
The slit lamp, also called a biomicroscope, allows eye doctors and optometrists to get a highly magnified view of the structures of the eye to thoroughly evaluate eye health and detect any signs of infection or disease.
First he examines the structures of the front of the eye (lids, cornea, conjunctiva, iris, etc.). Then, with the help of a special high-powered lens, he will view the inside of the eye (retina, optic nerve, macula and more).
A wide range of eye conditions and diseases can be detected with slit-lamp examination, including cataracts, macular degeneration, corneal ulcers, diabetic retinopathy, etc.
General procedure
While a patient is seated in the examination chair, they rest their chin and forehead on a support to steady the head. Using the biomicroscope, the ophtalmologist or optometrist then proceeds to examine the patient's eye. A fine strip of paper, stained with fluorescein, a fluorescent dye, may be touched to the side of the eye; this stains the tear film on the surface of the eye to aid examination. The dye is naturally rinsed out of the eye by tears.
Adults need no special preparation for the test; however children may need some preparation, depending on age, previous experiences, and level of trust.
Variations in methods
Direct focal illumination
Observation with an optical section or direct focal illumination is the most frequently applied method of examination with the slit lamp. With this method, the axes of illuminating and viewing path intersect in the area of the anterior eye media to be examined, for example, the individual corneal layers.
Direct diffuse illumination
This illumination method is applied for general surveys of anterior eye segments, general observation of the surfaces of crystalline lens and cornea, assessment of the lachrymal reflex and assessment of soft contact lenses.
Indirect illumination
With this method, light enters the eye through a narrow to medium slit (2 to 4 mm) to one side of the area to be examined.
This illumination method is applied for general surveys of anterior eye segments, general observation of the surfaces of crystalline lens and cornea, assessment of the lachrymal reflex and assessment of soft contact lenses
Retro-illumination
This illumination method is applied for: observation of vascularisations, micro cysts, vacuoles, oedemas, particles in lachrymal film, flow rate of lachrymal film, Descemet's membranes, lens reflection (examination in white field) - the greyish-white reflected light from the front surface of the crystalline lens lends the name to this type of illumination, superficial corneal defects, scars, particles in lachrymal film, dystrophy and cataract in neutral corneal area.
Scattering sclero-corneal illumination
With this type of illumination, a wide light beam is directed onto the limbal region of the cornea at an extremely low angle of incidence and with a laterally de-centered illuminating prism. In its normal physiological state, the cornea is fully transparent and appears completely clear. If the eccentricity of the light is properly adjusted a bright shining ring is visible around the entire limbus.
Fundus observation with the slit lamp
Fundus (eye) observation is known by the ophthalmic and the use of fundus cameras. With the slit lamp, however, direct observation of the fundus is impossible due to the refractive power of the ocular media. In other words: the far point of the eye (punctum remotum) is so distant in front of (myopia) or behind (hyperopia) that the microscope cannot be focused. The use of auxiliary optics - generally as a lens - makes it possible however to bring the far point within the focusing range of the microscope. For this various auxiliary lenses are in use that range in optical properties and practical application.
Fluorescence observation and slit lamp microscopy in contact lens fitting
This method not only permits the fit of contact lenses and the lachrymal flow to be assessed, but also allows superficial injuries of the corneal epithelium to be detected. Even minute corneal defects that may remain undiscovered by normal slit examination can be revealed in this way. Correct fluorescence observation requires a suitable excitation light source and a properly dosed concentration of fluorescein in the lachrymal film, fluorescein is inserted into the conjunctival sac either by drops or with a fluorescein strip.
This illumination method is applied for inspection of the anterior eye segments, inspection of contact lens fit, inspection of the cornea, inspection of contact lens and interpretation of fluorescence patterns under contact lenses with a spherical back surface (flat fitting, parallel fitting, steep fitting)
Conclusion
The slit lamp enables the user to inspect individual eye segments in quick succession to obtain a general impression of the eye and make a diagnosis. In a slit lamp, the most important type of illumination is the optical section. All other techniques are variations.
For survey examination of the anterior segment the slit is adjusted to full aperture. This results in a circular, very bright and evenly illuminated field that is slightly smaller than the microscope's field of view. By placing a ground glass into the optical path the entire field of view is illuminated. It is well known that the structure of transparent objects such as the cornea, anterior chamber, eye lens, and vitreous body can only be seen poorly in transmitted or reflected light, as the relative amplitude modulation of light is too weak and the phase modulation is not perceived by the eye. However, such objects can generally be observed well in scattered or fluorescent light.
Special lenses can be placed between the slit lamp and the cornea (or directly on the cornea) to view deeper structures of the eye, such as the optic nerve, retina, and the area where fluid drains out of the eye (drainage angle). A camera may be attached to the slit lamp to take photographs of different parts of the eye.
Fluorescein dye eyedrops may be used during a slit lamp examination to make it easier to detect a foreign body, such as a metal fragment or an infected or injured area on the cornea.
Literature

VELEUČILIŠTE VELIKA GORICA
UNIVERSITY OF APPLIED SCIENCES VELIKA GORICA

DRY EYE AND CONTCT LENSES

Diana-Marija Perić (the student of VVG)

ADVANTAGE AND PROBLEM OF DRY EYE AND CONTACT LENSES

CONTACT LENSES HAVE AN ADVANTAGE OVER GLASSES BECAUSE:

- THE SIZE OF THE IMAGE IS REAL
- DOING SPORTS BECOMES EASIER
- PEOPLE, ESPECIALY CHILDREN ARE SOCIALY BETTER RECOGNIZED

THE PROBLEM OF DRY EYE AND ITS DEFINITION:

A DRY EYE SUFFERER

In case of a very dry eye, contact lenses cannot be worn.But not many people suffer from such a strong dryness. Dry eye or so called dry eye syndrome is manifested in people who have ocular dryness with the feeling of sand present in their eyes, which makes them blink more often, or when they try to keep their eyes open for a longer period of time, the image becomes blurred.Most people complain about the feeling of an alien object in the eye, that is, the feeling of irritation in the eye.

DESCRIPTION

Dry eye syndrom is a condition when less tears get secreted or their quality gets reduced. Tears form smooth surface in the eye which affects visual sharpness, ensuring the passage of oxygen to the cornea, and moistens the surface of cornea and conjuctiva. On the surface of the eye, tears form a tear layer which consists of three layers: the first is mucosal, the second is water, and both are covered with a lipid (oil) layer. The interaction among layers of the tear film is very important. The quality of the tear film is more important than its quantity. Dry eye can be of a different 'level', but it is difficult to draw the line between mild and harmless disturbances on the one hand and those serious ones that must be monitored by an ophtalmologist on the other hand. Care should be taken!

DETERMINATION OF A DRY EYE SYNDROM AND SOLUTIONS FOR DRY EYE AND CONTACT LENSES

DETERMINATION OF A DRY EYE SYNDROM

To determine whether an eye is dry, standardized or well known tests are used:

- SCHIRMER TEST(but then again the structure of tears is important, and not just the quantity)
- TBUT (tear break up time)
- FLOURESCEIN COLOURING

The more modern approach takes into account the structure of tears and whether the dry eye is hyper evaporative or hypo evaporated, depending on the disfunction of water or lipid tear layer.

THE PROBLEM OF 'EXTENDED' WEARING OF LENSES ON THE EYE

The problem occurs when some people just do not pay attention to how long they have been wearing lenses, whether the date has expired or they do not follow the instructions concerning lenses. Instead, they start thinking that their eyes are not good for wearing lenses. That's why an optometrist should play a major role in guiding their clients how to maintain lenses.

AN EYE-TEST BEFORE FIRST WEARING OF CL

Before wearing contact lenses, one should have an eye test by an optometrist or ophthalmologist. Besides the classical eye test, a check up includes testing of eyes on a biomicroscope, that is, with cleft lamps, we look at the front of the eye to check whether eyes are well.). This way we see whether a person is too sensitive to wear lenses. It is a small percentage of people because nowadays there is a great variety of lenses and they are more comfortable than before. Optometrists in Croatia are not allowed to prescribe eye drops, gels and similar pharmacological substances, although they are expected to be familiar with them, because they should be prescribed by an eye doctor, or ophthalmologist.

SOLUTIONS FOR DRY EYE AND CONTACT LENSES

If someone wants to wear contact lenses, and has a dry eye:

- ARTIFICIAL TEARS
- GEL
- WATERY SUPPOSITORIES are prescribed.

In addition, inappropriate material can cause problems,too, that's why it is advisible to try on lenses made of different materials and take those which suit best.

CONTACT LENSES FOR DRY EYE

There are no special contact lenses for dry eye, but a client is recommended to use those that can reduce the feeling of ocular dryness.Soft contact lenses are made from the combination of hydrophilic (water-loving) polymers containing water which makes them moist and comfortable.

SURGERY TO RETAIN TEARS IN EYES-IMPLANTING SUPPOSITORIES

The surgery lasts a few seconds and it is expected from an eye doctor to inform the client that surgery is a painless routine procedure of easier kind, so one shouldn't worry. The aim of the operation is to keep as many tears as possible in the eyes. A lot of people who couldn't wear lenses due to the dryness of the eye, manage to solve their problem with this surgery.

CANADIAN STUDY ON (IR)REGULAR CHANGING OF CL

In Canada, in March 2010, a study on how often clients change their contact lenses has been carried out on 2000 adults, contact lens users. The results were amazing! 45% of them wore silicone hydrogel lenses which should be replaced every two weeks, 39 % wore mothly lenses, which should be changed once a month and 16% wore daily disposable ones.Most often they spoke of forgetting to change lenses, while others claimed that their reason for not keeping the manufacturer's instructions was in saving money. But an interesting fact is that 9% of them were given instructions by an ophthalmologist to use them longer than specified by the manufacturer. Younger lens carriers more frequently violated instructions.

CONCLUSION

To summarize, in most of the cases it is possible to help a contact lense holder to solve the problem of ocular dryness and feel more comfortable wearing lenses by changing lthem,using artificial tears, having adequate hygiene or performing a small surgery.Still all should be checked in time to avoid serious inconveniences and problems. Here are some of the photos od medications which should be used only after being prescribed by an ophtalmologist.

BLINK CONTACTS EYE DROPS(artificial tears) based on a chemical components of staklovina(ne znam tu riječ) and some other eye parts

OPTIVE DROPS that work deeply in the eye, trying to keep the osmotic balance

VISMED STERILE DROPS for eye moistering

VISMED is a unique preservative-free lubricant eye drop that offers an unmatched combination of long-lasting relief of sensations of ocular dryness with optimal eye comfort

VISMED is compatible with all types of contact lenses (rigit or soft) during wearRgular use of SYSTANE ULTRA offers a long-lastin relief and reduces symptoms of ocular dryness with contact lense holders

SYSTANE BALANCE is aimed at people who suffer from ocular dryness due to MGD (Meibomian Gland Disfunction). Especially recommended to block too fast dryning of the tear film.

BIBLIOGRAPHY AND WEBSITES:

http://kontaktne-lece.net/pitajte-kontaktologa/cijene/suho-oko/

http://www.optike.hr/vijesti-iz-oftalmologije/cak-40-ljudi-nosi-dotrajale-kontaktne-lece.php

http://kontaktne-lece.net/pitajte-kontaktologa/cijene/suho-oko/

http://kontaktne-lece.net/pitajte-kontaktologa/cijene/suhoca-oka-i-kontaktne-lece/

http://kontaktne-lece.net/pitajte-kontaktologa/cijene/zasto-dolazi-do-zamagljivanja-leca-u-vrijeme-nosenja/

http://www.optometrija.net/tag/suho-oko

http://www.google.hr/search?q=slika+suhog+oka&bav=on.2,or.r_qf.&bvm=bv.50165853,d.bGE,pv.xjs.s.en_US.seW1cfrvSKg.O&biw=1366&bih=573&um=1&ie=UTF-8&hl=en&tbm=isch&source=og&sa=N&tab=wi&ei=4An9UfPmFtD64QTovICoDQ

http://www.google.hr/search?q=slika+suhog+oka&bav=on.2,or.r_qf.&bvm=bv.50165853,d.bGE,pv.xjs.s.en_US.seW1cfrvSKg.O&biw=1366&bih=573&um=1&ie=UTF-8&hl=en&tbm=isch&source=og&sa=N&tab=wi&ei=4An9UfPmFtD64QTovICoDQ

http://www.kontaktne-lece.eu/magazin/nisu-sve-umjetne-suze-iste-optive-kapi-djeluju-dvostruko-povrsinski-i-dubinski/

https://www.facebook.com/media/set/?set=a.4105009023405 78.90109.303611126362890&type=3

http://www.google.hr/search?gs_rn=23&gs_ri=psy-ab&pq=slika+suhog+oka&cp=8&gs_id=z&xhr=t&q=systane+ultra&biw=1366&bih=573&bav=on.2,or.r_qf.&um=1&ie=UTF-8&hl=en&tbm=isch&source=og&sa=N&tab=wi&ei=gQ_9Ue-gES_07Abg-oHIBQ

http://www.google.hr/search?q=systane+balance&bav=on.2,or.r_qf.&bvm=bv.50165853,d.bGE&biw=1366&bih=573&pdl=300&um=1&ie=UTF-8&hl=en&tbm=isch&source=og&sa=N&tab=wi&ei=8BD9UeKqHNPe7AasyYCQDg

http://www.google.hr/#client=psy-ab&pq=suho+oko+zbog+MGD&bpq=suho+oko+zbog+MGD&gs_l=serp.3...170196.177040.0.17880.9.7.0.0.0.0.505.4930.2-12j3j1j1.17.0....0...1c.1.23.psy-ab..6.11.3337.RPCma-NekYo&pbx=1&bav=on.2,or.r_qf.&fp=f44801ff4efe230b&biw=1366&bih=573

http://hr.wikipedia.org/wiki/Neovaskularizacija_ro%C5%BEnice

Vliv diabetické retinopatie na barvocit

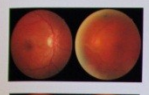
Autor: Mgr. Silvie Raimrová

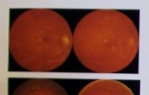
Vedoucí práce: MUDr. Monika Synková

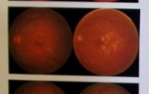
Ústav: Lékařská fakulta Masarykovy univerzity, Katedra optometrie a ortoptiky

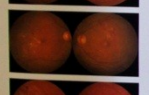
Fakultní nemocnice u Svaté Anny, Klinika očních nemocí a optometrie, Brno

Diabetická retinopatie









- Základním patogenetickým podkladem vzniku diabetické retinopatie je hyperglykémie. Poškození kapilár sítnice diabetika může být vysvětleno mnoha mechanismy. Příčinou může být sorbitolové přetížení, vliv hromadění pokročilých produktů neenzymatické glykace, oxidační stres i buněčná apoptóza, způsobená paradoxním glukózovým hladověním.
- Základní třídění DR je založeno na charakteristice mikrovaskulárních změn na sítnici a na přítomnosti neovaskularizace. Lze ji rozdělit na formu neproliferativní a proliferativní.
- Neproliferativní DR (NPDR): mírná, středně pokročilá, pokročilá, velmi pokročilá forma
- Proliferativní DR (PDR): počínající, vysoce riziková, pokročilá s komplikacemi

- Na očním pozadí se zpočátku objevují mikroaneurysmata (MA), což jsou kapilární dilatace ve středních vrstvách sítnice. Vznikají díky odumírání pericytů a následnému oslabení stěny kapiláry. MA se vyvíjejí nejčíve na venózní straně kreviního řečiště, konkrétně v temporální části makuly nebo temporálně od makuly.
- Retinální řečištivé hemoragie vznikají právě při porušení stěny MA nebo kapilár. Dlejné jako MA se nacházejí temporálně a jsou to malé červené tečky uložené na vnitřní jádrové nebo zevní plexiformní vrstvě.

- Tvrdá ložiska vznikají při prosakování krevní plazmy z dilatovaných kapilár a MA a jedná se o ložiska bílkovin a lipidů. Mají žlutou barvu a svým vzhledem připomínají hrudky másla. Opět je lze nalézt ve středních vrstvách sítnice, v makule ve vrstvě nervových vláken.

- Vatovitá ložiska jsou příznakem pokročilé ischemie a vznikají v důsledku infarktů ve vrstvě nervových vláken, což je důsledek uzávěru prekapilárních arterií.
Na očním pozadí vypadají jako chomáčky vaty a často jsou obklopeny mikroaneurysmaty.

- Intraretinální mikrovaskulární abnormality (IRMA) jsou dilatované kolaterální kanály. Nejedná se o skutečné neovaskularizace, protože IRMA nepřekračuje membrana limitans interna a není tak zdrojem preretinálního či sklivcového krvácení. Rozšíření neovaskularizací a IRMA je velmi obtížné.

- Věny získávají korálkovitý vzhled a rozšiřují své lumen, čemuž se říká febopatie.
Na větších žilních kmenech vznikají omega kličky, jejichž podkladem jsou dilatované kolaterály.
- Neovaskularizace označuje novotvoření jemných cév, uložených nad membrana limitans interna. Nejvýznamnější faktor ovlivňující NVS sítnice je cévní endoteliový růstový faktor (vascular endothelial growth factor, VEGF). Zvýšené hladiny aktivity VEGF podporuje především hypoxie. Novotvořené cévy mohou samy vymizet, jindy se změní ve fibrózní tkáň, nebo dramaticky buj, aspoň jedna čtvrtina sítnice již ischemická.

- **SHRNUTÍ:**
- Na obrázku je patrné devadesátiti poškození sítnice diabetickou retinopat
- Mírná NPDR: MA, sítnicové hemoragie, tvrdé exsudáty
- Středně pokročilá NPDR: mírná NPDR + vatovitá ložiska nebo IRMA
- Pokročilá NPDR: MA+hemoragie ve 4 kvadrantech, žilní abnormality ve 2 kvadrantech, IRMA v 1 kvadrantu.
- Velmi pokročilá NPDR: rozsáhlé poškození sítnice výše uvedenými rysy
- Počínající PDR: NVG nebo preretinální krvácení
- Vysoce riziková PDR: rozsáhlé NVD nebo NVD+preretinální krvácení
- Pokročilá PDR: všechny výše uvedené rysy a rozsáhlé krvácení do sklivce, odchýlení sítnice včetně makuly

Na rozdíl od zdravé populace se hodnoty TES u diabetiků značně liší a křivka má velmi nerovnoměrný průběh. Přesto lze říci, že i když pacienti trpí onemocněním různě dlouhou dobu, DR vzniká v různých věkových etapách a sítnice je postižena jinou formou DR, ovlivňuje vše hodnoty TES.

Barevný vjem i zraková ostrost spolu úzce souvisí, protože obě tyto funkce jsou podmíněny správnou všedbou a fyziologickým fungováním čípků. Se snižující se zrakovou ostrostí hodnoty TES klesají. To znamená, že čím je horší zraková ostrost, tím horší jsou výsledky barevného testu.

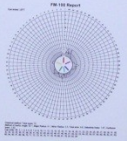
Hodnoty testu výrazně ovlivňuje diagnostikovaná forma diabetické retinopatie. S narůstajícím poškozením sítnice, roste i hodnota TES. Nicméně nejvýznamnější úlohu představuje přítomnost či nepřítomnost makulopatie a makulárního edému. Je-li přítomna, jsou hodnoty TES vyšší.

Farnworth – Munsellův 100 Hue Test

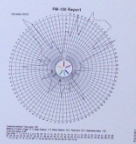
Tento vyšetřovací test je založena na Munsellově systému barev, který byl vyvinut v roce 1940. Systém vychází z pěti základních barevných odstínů (hues): červený (R), žlutý (Y), zelený (G), modrý (B) a purpurový (P). Základní odstíny spolu dohromady vytváří další typy: RY, YG, GB, BP, RP a každá z těchto barev má deset pododstínů (př. 1 RY – 10 RY). Takto uspořádaný systém dohromady utváří sto barevných odstínů, které se shodují v jasu (value) a sytosti (chroma).

Většina jedinců obličné rozezná 15 odstínů z původní sady, a proto je Farnsworth vyřešil a vytvořil test s 85 barevnými terčíi. Farnsworth – Munsellův 100 Hue Test (FM 100) v manuální podobě je rozdělen do čtyř sad, v pravém boxu jsou terče nabývajících číselných hodnot 85 - 21, ve druhém 22 - 42, ve třetím 43 - 63 a v posledním 64 - 84. První a poslední terč v každém zásobníku je fixní a pacient má za úkol seřadit terče v barevné posloupnosti, která stimuluje spektální sekvenci. Každému terčí je přiřazeno konkrétní pořadové číslo a podle jejich umístění se počítá celkové chybové skóre (Total error score=TES). TES je závislá na věku a mezi dvacátým a třicátým rokem se jeho hodnota zvyšuje.

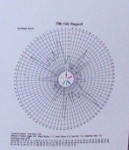
Digitalizovaný FM 100 test na LCD optotypech má oproti manuální formě mnoho výhod, dle i nevýhod. Jeho předností jsou kvantitativní skórování a porovnávání se statistickými normami, diagnostika vrozených a získaných poruch. Nevýhodná je jeho časová i mentální náročnost. Test je spíše vhodný pro výzkumné účely, než do běžné klinické praxe. Vyšetření probíhá monokulárně, s nejlepší možnou zrakovou ostrostí, ze vzdálenosti jednoho metru a při osvětlení 200 – 250 luxů.



Žena, 21 let, DM 1 typu
sítnice beze změn



Muž, 48 let, DM 1 typu
středně pokročilá NPDR



Muž, 56 let, DM 1 typu
pokročilá PDR a jiné komplikace spojené s DM

Prevalence DR se zvyšuje s délkou trvání DM, nicméně je nutné rozlišit, zda jde o DM 1. nebo 2. typu. U pacientů typickým 1. typem cukrovky, nebývá v době stanovení diagnózy DR vyvinuta. Po 15 letech je postižena už 98% a po 20 letech 99%.

U diabetiků 2. typu je DR často zjištěna a diagnózou cukrovky. Po 15 letech výskyt DR narůstá na 58 - 85%.

Ve věkovém rozsahu 20 – 65 let je DR hlavní příčinou praktické slepoty. Tehdy 8 % lidí s praktickou slepotou, přišlo o zrak právě kvůli pozdním komplikacím cukrovky. Riziko slepoty paradoxně stoupá s inzulínovou léčbou, je až 15 - krát vyšší.

Klinické testy prokázaly, že míra poruchy barvocitu je závislá na rozsahu poškození sítnice. Vzhledem k tomu, že je barvocit vázán na čípky, které jsou kumulovány v makule a jejím blízkém okolí, tak je barvocit nejvíce ovlivněn diabetickou makulopatií. Vliv na barvocit popsali Dubois – Poulsen a Cochet v roce 1954. Zjistili, že zejména u pokročilejších stádií DR je postižena vnímání modré barvy. Porucha barvocitu může nastat i po fotokoagulační léčbě v důsledku úbytku fotoreceptorů. Pacient může vnímat jisté změny hned po léčbě, buď vlivem rozptylu světla, nebo díky vzniku postoperativního makulárního edému. Tento stav se za 1 – 2 týdny upraví.

Hodnocení FM 100 HUE Test

Klasická metoda hodnotí celkové chybové skóre (TES):

0 - 20:	vynikající barvocit,
20 - 100:	fyziologicky barvocit,
100 a více:	narušený barvocit.

Metodou Momentu ochabnutí (MOI) podle Vingryse a King – Smitha vychází z barevného trojúhelníka, ve kterém má každý terč své definované místo a z toho lze stanovit jeho barevný rozdílový vektor. Orientace vektoru určuje barevný defekt a délka udává stupeň závažnosti poruchy barvocitu. Sumací vektorů získáme výsledný malý a velký rádius, který udává minimální a maximální moment ochabnutí. U normálních trichromatů je velikost obou rádiusů přibližně stejně velká.

Confusion angle = úhel ochabnutí je dán orientací velkého rádiusu.

Confusion index = index změny ukazuje na závažnost poruchy.

C-index = 1,00 – 1, 60	norma,
C-index> 1,60	porucha barvocitu.

Selectivity(scatter) index = index výběru udává polarizaci vady.

S-index ≤ 2,00	náhodné rozložení terčů,
S-index > 2,00	čím větší číslo, tím větší polarizace vady.

Total error (TE) = celková chyba: vznikne jako výsledek druhé odmocniny součtu druhých mocnin velkého a malého rádiusu.

…… workshopy…..

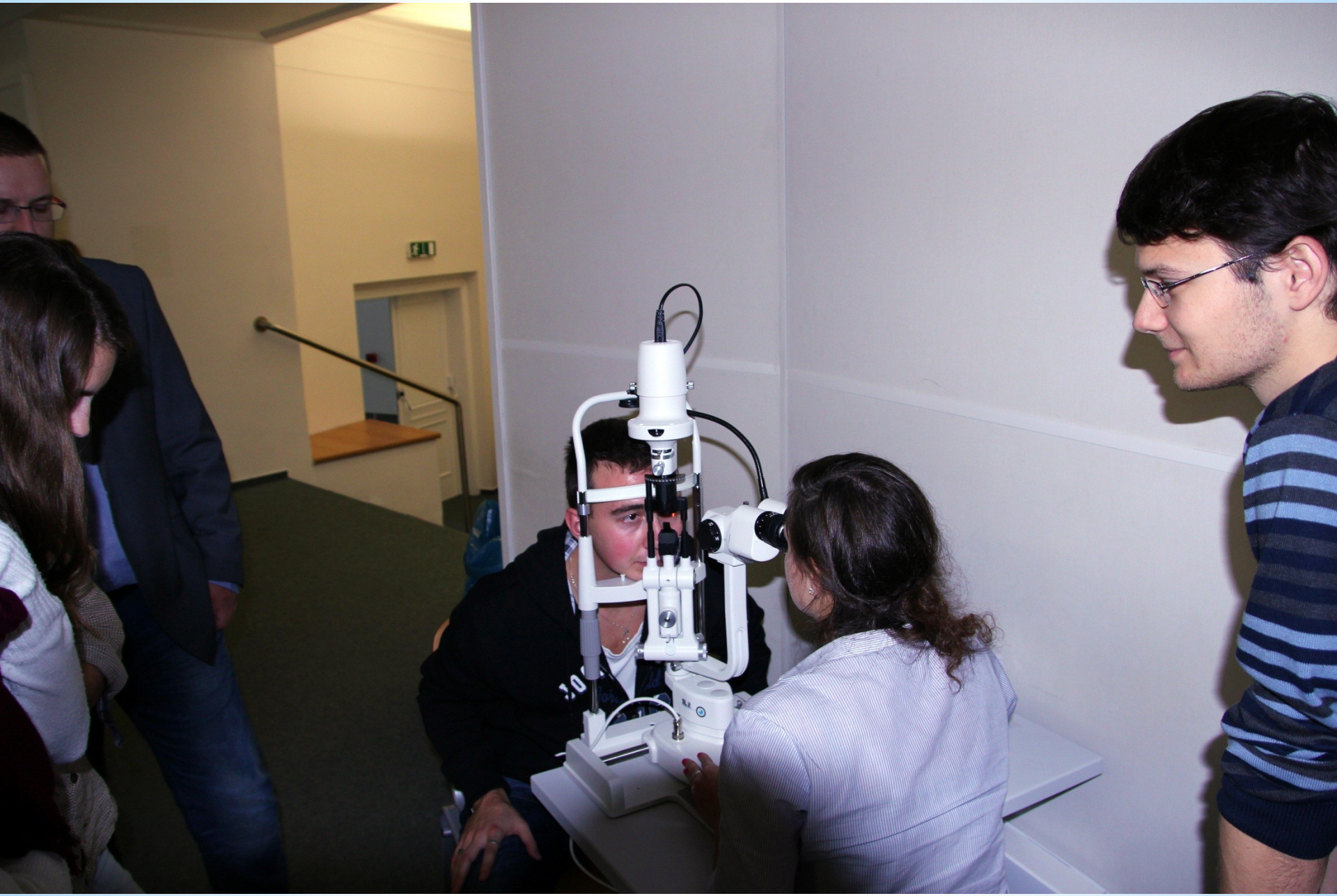

ZÁKAZ
KOUŘE


Workshop E.
CHEIROSKOP


Workshop E:
CHEIROSKOP


Eye-T
Crizal
Prožijte průzračný život
Visioffice


Eye-T
essilor
Crizal
Prožijte průzračný život
VARILUX
Přirozené vidění. Navždy.
Xperio
The polarized experience
Crizal Transitions




Crizal


978-80-246-1325-3.
FILOUŠ, Aleš. Katarakta u dětí. VOX PEDIATRIAE: časopis praktických
lékařů. říjen/2003, roč. 3, č. 8.
Brůnová, Blanka. Dětská oftalmologie. VOX PEDIATRIAE: časopis prakti
dětských lékařů. prosinec/2008, roč. 8, č. 10.
12
13
Kliknutím vložíte poznámky.
SNÍMEK 13 Z 13
ČEŠTINA
POZNÁMKY
KOMENTÁŘE

…. Ukončení s úsměvem…..
těšíme se na

5.CSKO….