



**Clinical
Optometry
Poland 2024**



Abstract Book

Warsaw 2024

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PROGRAMME

DAY 1 - 15.11.2024



HAYNE
TECHNOLOGIA DLA OPTYKI

WORKSHOP

Principles of Scleral Contact Lens Fitting - partner sponsor: SWISSENS / equipment supplier: HAYNE
Specialty Contact Lenses

09:30 - 10:30 / 60 min / Workshop room 1
Priscilla Sonomayor & Swissslens



WORKSHOP

A functional approach to visual function testing for children with developmental challenges
Binocular vision

09:30 - 10:30 / 60 min / Workshop room 3
Anna Jarosz

WORKSHOP

Measuring Carotenoid Levels and Macular Pigment in Eye Care
Clinical Optometry

09:30 - 10:30 / 60 min / Workshop room 2
Greg Caldwell

Coffee break

Other / 10:30 - 11:00 / 30 min

HAYNE
TECHNOLOGIA DLA OPTYKI

WORKSHOP

Implementing Vision Therapy in Optometric Practise: Principles, Differentiation, and Revenue Opportunities
- partner: HAYNE
Binocular vision

11:00 - 12:00 / 60 min / Workshop room 3
Matic Vogric



WORKSHOP

From diagnosis to therapy, Light for Dry Eye
- partner: LUMIBIRD & TOPCON
Specialty Contact Lenses



11:00 - 12:00 / 60 min / Workshop room 1
Anna Maria Ambroziak

HAYNE
TECHNOLOGIA DLA OPTYKI

WORKSHOP

Posterior segment exam using Binocular Indirect Ophthalmoscope
- partner sponsor: HAYNE
Clinical Optometry

11:00 - 12:00 / 60 min / Workshop room 2
Beata I. Lewandowska

	<p>WORKSHOP Basic ABCs in ophthalmic emergencies Clinical Optometry 12:00 - 13:00 / 60 min / Workshop room 2 <i>Joanna Przewdziecka-Dolyk</i></p>
	<p>WORKSHOP Optometric eye exam of children below 10 years old - partner sponsor: HAYNE Binocular vision 12:00 - 13:00 / 60 min / Workshop room 3 <i>Joanna Zdybel</i></p>
	<p>Interactive Clinical Case Workshop Based on the IACLE Case Report Series - partner: ALCON Specialty Contact Lenses 12:00 - 13:00 / 60 min / Workshop room 1 <i>Sylwia Kropacz-Sobkowiak, Tomasz Suliński</i></p>
	<p>Lunch Other / 13:00 - 14:00 / 60 min</p>
	<p>Opening ceremony Other / 14:00 - 14:30 / 30 min / Plenary room <i>Dominika Olkowska, PTOO</i></p>
	<p>Corneal Topography in optometric practice Clinical Optometry 14:30 - 15:00 / 30 min / Plenary room <i>Sylwia Kropacz-Sobkowiak</i></p>
	<p>The Cornea's Corner: A Closer Look at Common Diseases Clinical Optometry 15:00 - 16:00 / 60 min / Plenary room <i>Beata I. Lewandowska</i></p>
	<p>Diagnosis of keratoconus Clinical Optometry 16:00 - 16:30 / 30 min / Plenary room <i>Jagoda Rzeszewska-Zamiara, Patryk Młyniuk</i></p>
	<p>Coffee break Other / 16:30 - 17:00 / 30 min</p>
	<p>OCT Cases for Anterior and Posterior Disease Clinical Optometry 17:00 - 18:00 / 60 min <i>Greg Caldwell</i></p>

Corneal Imaging and Transplantation

Clinical Optometry

18:00 - 18:30 / 30 min / Plenary room

Dariusz Dobrowolski

Recent Innovations in Ophthalmic Optical Coherence Tomography

Clinical Optometry

18:30 - 19:00 / 30 min / Plenary room

Ireneusz Grulkowski

Refraction after lens replacement

Clinical Optometry

19:00 - 19:30 / 30 min / Plenary room

Janusz Skrzypecki

Postoperative refractive errors and patient management problems

Clinical Optometry

19:30 - 20:00 / 30 min / Plenary room

Anna Chomicka

Discussion panel

Clinical Optometry

20:00 - 20:30 / 30 min

DAY 2 - 16.11.2024

TFOS DEWS II Raport Revision

Specialty Contact Lenses

09:00 - 09:30 / 30 min / Plenary room

Anna Maria Ambroziak



Alcon - sponsor lecture: Modern Contact Lens Patient Management: Long-Term Care and Patient Education

Specialty Contact Lenses

09:30 - 10:00 / 30 min / Plenary room

Vincent Molkenboer

Coffee break

Other / 10:00 - 10:30 / 30 min

Scleral Lenses for Ocular Surface Disease

Specialty Contact Lenses

10:30 - 11:30 / 60 min / Plenary room

Priscilla Sonomayor



Myopia Management with soft contact lens

Cooper Vision - sponsor lecture

Specialty Contact Lenses

11:30 - 12:00 / 30 min / Plenary room

Wojciech Kida

Fitting Corneal Rigid Contact Lenses-What Have We Lost-The art or the Science?!

Specialty Contact Lenses

12:00 - 12:30 / 30 min / Plenary room

David Berkow

BAUSCH+LOMB

Bausch & Lomb - sponsor lecture:

Do We Know and Understand the Polish Presbyopic Contact Lens Wearer?

Specialty Contact Lenses

12:30 - 13:00 / 30 min / Plenary room

Mateusz Świerad

Lunch

Other / 13:00 - 14:00 / 60 min

Evolving protocols to quantify patterns of ocular motility

Binocular vision

14:00 - 15:00 / 60 min / Plenary room

Kevin Willeford

Coffee break

Other / 15:00 - 15:30 / 30 min

Oculomotor dysfunction in Amblyopia

Binocular vision

15:30 - 16:00 / 30 min / Plenary room

Maciej Perdziak

The role of the optometrist in the rehabilitation of children with special needs

Binocular vision

16:00 - 16:30 / 30 min / Plenary room

Anna Jarosz

The role of the optometrist in dealing with children with reading, writing and learning difficulties

Binocular vision

16:30 - 17:30 / 60 min / Plenary room

Alicja Brenk-Krakowska, Hanna Buczkowska

Marzena Nowak, Lucyna Karbowskiak

Discussion panel

Binocular vision

17:30 - 18:00 / 30 min / Plenary room

rapid fire #1

Other / 18:00 - 18:30 / 30 min / Plenary room

18:00 - 18:05 Short-time changes in the anterior segment of the eye induced by accommodation – preliminary study

18:05 - 18:15 Assessment of morphometric and dynamic changes of the cornea in keratoconic and forme fruste eyes using optical coherence tomography

18:15 - 18:20 Investigation of Fixation Stability in Primary

18:20 - 18:25 Open-Angle Glaucoma using NeuroFET
Oculomotor impairments in children with Fetal Alcohol Spectrum Disorder (FASD)

rapid fire #2

Other / 18:30 - 19:00 / 30 min / Plenary room

18:30 - 18:35 Assessment of myopia management options for an antimetropic patient

18:35 - 18:40 Dynamic exam behaviors differ across performance cohorts

18:40 - 18:45 Analysis of Vision Screening Results in Teenagers in Poland

18:45 - 18:50 Seeing the invisible: two-photon vision and its contrast sensitivity function

GALA

Other / 20:00 - 22:00 / 120 min

DAY 3 - 17.11.2024

Myopia Control

Myopia Management

09:00 - 10:00 / 60 min / Plenary room

Mark Bullimore

Coffee break

Other / 10:00 - 10:30 / 30 min

**Monitoring Myopia Control -
Biometry-Technology Options**

Myopia Management

10:30 - 11:00 / 30 min / Plenary room

David Berkow

Evidence-based myopia control

Myopia Management

11:00 - 11:30 / 30 min / Plenary room

Janusz Skrzypecki

	<p>Red-Light Therapy- A New Myopia Management Intervention Myopia Management 11:30 - 12:00 / 30 min / Plenary room <i>David Berkow</i></p>
	<p>Confidence through evidence: Latest evidence on DIMS lenses, Hoya Polska - sponsor lecture Myopia Management 12:00 - 12:30 / 30 min / Plenary room <i>Sylwia Kijewska, Hoya Lens Poland</i></p>
	<p>Discussion panel Myopia Management 12:30 - 13:00 / 30 min / Plenary room</p>
	<p>Lunch Other / 13:00 - 14:00 / 60 min</p>
	<p>World Council of Optometry update Business Session 14:00 - 14:30 / 30 min / Plenary room <i>Beata I. Lewandowska</i></p>
	<p>Business discussion: Optometry – Is There Only One Career Path? Business Session 15:30 - 16:00 / 30 min / Plenary room Presenting: Dominika Olkowska Authors: Justyna Iżykowska, Joanna Brenk, Wojciech Kida, Sylwia Kijewska, Konrad Abramczuk, Magda Łoskot, Sylwia Kropacz Sobkowiak</p>
	<p>Exhibition Other / 16:00 - 17:00 / 60 min</p>

ABSTRACTS

PRESENTING:

David Berkow

TITLE OF SPEECH:

Monitoring Myopia Control - Biometry-Technology Options.

AUTHORS:

Dr. David Berkow

AFFILIATION/INSTITUTION:

Department of Ophthalmology, Rambam Health Care Campus, Haifa, Israel.

ORAL PRESENTATION**KEYWORDS:**

Myopia Control, Biometers. Optical Biometers

CONTENT OF THE ABSTRACT:**Background:**

The prevalence of myopia has increased extensively worldwide, spanning not only East Asia but also Europe [1]. Studies have shown that children engaging in prolonged near work, spending less time outdoors, and having myopic parents face an elevated risk of developing myopia [2]. Therefore, the World Council of Optometry asserts that myopia management should be the standard of care provided by optometrists [3]. Once the intervention for managing myopia progression has been decided, optometrists must monitor its progress. This can be achieved through cycloplegic refraction or by measuring the axial length of the eye or both.

Purpose:

This presentation will be particularly beneficial for practitioners who, due to constraints, are unable to conduct cycloplegic refraction and must rely on measuring the axial length of a child's eye to monitor myopia progression.

Content:

This presentation will elucidate the significance of measuring axial length and how changes in axial length correspond to refractive changes (i.e., a 1mm change in axial length corresponds to a 2.5D change in myopia [4]. The presentation will clarify the distinctions between an optical biometer and an ultrasound biometer and why optometrists use an optical biometer to measure axial length of the eye rather than an ultrasound biometer [5,6,7]. Measuring and monitoring axial length is important to assess the risk of myopia and after beginning myopia management, axial length measurement and comparing measurements can confirm the treatment effect [8,9].

Results:

A recent study by Jiang et al., 2023 found that there is a definite association between axial length elongation and myopic spherical equivalent among children and adolescents with age [10]. Details of the leading optical biometers which measure axial length will be explained.

Recommendations/ Conclusions:

The presentation will centre on optical biometers available for optometrists, providing a comparative analysis of their features [11,12,132]. Axial length measurement should be considered the gold standard measurement of myopia management because not all Eye Care Practitioners (ECPs) can conduct a cycloplegic refraction but all ECPs can conduct axial length measurement.

References:

1. Gryzbowski A., Kanclerz P., Tsubota K., Lanca C., Saw S-M., 2020. A review on the epidemiology of myopia in school children worldwide. *BMC Ophthalmology*.20:27, 1-11.
2. Pärssinen O., Kauppinen M., 2022. Association of near work time, watching TV, outdoors time, and parents' myopia with myopia among school children based on 38-year-old historical data. *Acta Ophthalmologica*. 100: e430-e438.
3. www.myopia.worldcouncilofoptometry.info/standard-of-care

4. www.myopiaprofile.com/articles/axial-measurement-in-clinical-practice.
5. Chia T. M. T., Nguyen M.T., Jung H.C., 2018. Comparison of optical biometry versus ultrasound biometry in cases with borderline signal-to-noise ratio. *Clinical Ophthalmology*. 12, 1757-1762.
6. Khoramnia R., Auffarth G., Labuz G., Pettit G., Suryakumar R., 2022. Refractive outcomes after Cataract Surgery. *Diagnostics*. 12, 243. 1-14. <https://doi.org/10.3390/diagnostics12020243>
7. Holliday J.T., 2009. Ultrasonic and Optical Biometry/ Mini Focus on Diagnostics. *Cataract & Refractive Surgery Today Europe*. 18-19.
8. Tideman J.W.L., Polling J.R., Vingerling J.R., Jaddoe V.W., Williams C., Guggenheim J.A., Klaver C.C., 2018. Axial Length Growth and the risk of developing myopia in European children. *Acta Ophthalmologica*. 96 (3), 301-309.
9. Diez P.S., Yang L.H., Lu M.X., Wahl S., Ohlendorf A., 2019. Growth curves of myopia-parameters to clinically monitor the refractive development in Chinese schoolchildren. *Graefe's Archive for Clinical and Experimental Ophthalmology*. 257 (5): 1045-1053.
10. Jiang F., Wang D., Yin Q., He M., Li Z., 2023. Longitudinal Changes in Axial Length and Spherical Equivalent in Children and Adolescents With High Myopia. *Investigative Ophthalmology and Visual Science*. Vol. 64, No.12, Article 6, <https://doi.org/10.1167/iovs.64.12.6>.
11. www.beye.com/compare/optical-biometers
12. Montes-Mico R., 2021. Evaluation of 6 biometers based on different optical technologies. *Journal of Cataract and Refractive Surgery*. 48: 16-25.
13. =Akerman D., 2021. Why Invest in an Optical Biometer to Measure Axial Length? R

PRESENTING:

Patryk Mlyniuk

TITLE OF SPEECH:

Assessment of morphometric and dynamic changes of the cornea in keratoconic and forme fruste eyes using optical coherence tomography.

AUTHORS:

Patryk Mlyniuk^{1,2*}, Ewa Mączyńska-Walkowiak³, Jagoda Rzeszewska-Zamiara^{1,2}, Alfonso Jimenez-Villar³, Bartłomiej J. Kałużny^{1,2}, Ireneusz Grulkowski³

AFFILIATION/INSTITUTION:

1Department of Ophthalmology, Collegium Medicum, Nicolaus Copernicus University, ul. Ujejskiego 75, 85-168 Bydgoszcz, Poland
 2Oftalmika Eye Hospital, ul. Modrzewiowa 15, 85-631 Bydgoszcz, Poland
 3Institute of Physics, Faculty of Physics, Astronomy and Informatics, Nicolaus Copernicus University, ul. Grudziadzka 5, 87-100 Torun, Poland

ORAL PRESENTATION

KEYWORDS:

Keratoconus, dynamics of the cornea, optical coherence tomography

CONTENT OF THE ABSTRACT:

Purpose:

In keratoconus, there are many morphometric changes of the cornea, including its thinning and increased curvature, which leads to a significant decrease in visual acuity [1-2]. An important aspect is the detection of the disease at a very early stage. The gold standard in the diagnosis of keratoconus is corneal tomography [3], but changes in tissue stiffness precede morphometric changes, so dynamic tissue assessment seems justified [4]. The aim of the study is to assess changes in the morphometry and dynamics of the cornea in keratoconic and forme fruste eyes to normal eyes using optical coherence tomography (OCT) devices.

Methodology:

A 96 eyes were included in the study, including 50 normal eyes, 15 forme fruste eyes and 31 eyes with early to moderate keratoconus. The patients underwent a full ophthalmological examinations with

orneal tomography (MS-39, CSO, Italy), optical biometry (IOLMaster 700, Zeiss, Germany) and measurement of the dynamic properties of the cornea using the prototype SS-OCT with the air-puff system.

Results:

The eyes with keratoconus had the highest simulated keratometry with a mean value of 46.2 ± 2.85 D ($p < 0.001$). Significantly higher values of maximum curvature of the anterior and posterior corneal surfaces were also observed for keratoconic eyes ($p < 0.001$). Central corneal thickness (CCT) was significantly lower in eyes with keratoconus, with a median of $499.0 \mu\text{m}$ ($470.5\text{-}520.0$) ($p < 0.001$). In the case of dynamic parameters, the maximum corneal displacement was greatest in eyes with keratoconus and its mean value was 1.07 ± 0.11 mm ($p < 0.001$). In addition, eyes with keratoconus achieved a higher velocity of corneal apex displacement in two extremes and the time between the velocity extremes was longer ($p < 0.05$).

Summary:

In eyes with keratoconus, corneal curvature increases and the thickness of the cornea decreases. In turn, tissue stiffness decreases, and therefore the dynamic parameters of the cornea are changed: maximum corneal displacement, velocity and time between two extremes of velocity increase. It does not allow differentiation of forme fruste eyes from healthy eyes.

PRESENTING:

Aleksandra Gorczyca-Liczbik

TITLE OF SPEECH:

Investigation of Fixation Stability in Primary Open-Angle Glaucoma using NeuroFET

AUTHORS:

Aleksandra Gorczyca-Liczbik^{1*}, Marta Skrok², Robert Konklewski³, Martyna Gebaska-Toloczko⁴, Karolina Suwala⁴, Maciej Nowakowski³, Valentyna Pryhodiuk², Anna Szkulmowska³, Katarzyna Zabel⁴, Przemysław Zabel⁴, Maciej Szkulmowski², Jakub J. Kaluzny⁴

AFFILIATION/INSTITUTION:

1 Doctoral School of Medical and Health Sciences in Bydgoszcz, Nicolaus Copernicus University in Torun, Poland 2 Institute of Physics, Faculty of Physics, Astronomy and Informatics, Nicolaus Copernicus University in Torun, Grudziadzka 5, 87-100 Torun, Poland 3 INOKO.VISION LLC, 87-100 Torun, Poland 4 Department of Sensory Organ Studies; Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Torun, Poland

POSTER

KEYWORDS:

Primary Open-Angle Glaucoma, fixation stability, microsaccades, eye movements, retina

CONTENT OF THE ABSTRACT:

Purpose:

Previous studies have shown that the fixational eye movements are affected in glaucoma, but the results are inconclusive. The aim of this study was to determine whether primary open-angle glaucoma (POAG) is associated with disturbances in fixation stability assessed by experimental retinal eye tracking system (NeuroFET) and whether the severity of glaucoma is related to a deterioration in these indicators.

Methods:

This study analyzed fixation stability using NeuroFET, a unique, non-invasive optical device for measuring microsaccades and drifts, in patients with mild and moderate/severe POAG and healthy controls. We successfully analyzed 50 eyes in the POAG groups (39 mild POAG and moderate/severe 11 POAG) and 50 eyes in the healthy group.

Results:

It was shown that differences in fixation stability measured during 15s fixations did not in POAG eyes, and differences in bivariate contour ellipse area (BCEA), including 95%/63% of fixation points, were not observed among groups. Differences were observed in the microsaccades duration. POAG groups manifesting shorter duration of microsaccade for the same microsaccadic amplitudes than the normal group. Median duration of microsaccade in patients with mild POAG was 0,05518 s ($p < 0,001$), median duration of microsaccade in patients with moderate/severe POAG was 0,05736 s ($p < 0,05$). Median duration of microsaccade in healthy patients was 0,06228 s.

Conclusion:

We concluded that POAG patients do not manifest differences in fixation stability measured with BCEA but show discrepancies in the microsaccadic duration which can be effectively assessed using NeuroFET.

Research

1. M. M. Bartuzel, K. Wróbel, S. Tamborski, M. Meina, M. Nowakowski, K. Dalasiński, A. Szkulmowska and M. Szkulmowski. High-resolution, ultrafast, wide-field retinal eye-tracking for enhanced quantification of fixational and saccadic motion. *Biomed Opt Express* 11, 3164-3180 (2020).
-

PRESENTING:

Bartosz Lachowicz

TITLE OF SPEECH:

Short-time changes in the anterior segment of the eye induced by accommodation – preliminary study

AUTHORS:

Bartosz Lachowicz, Agnieszka Józwick

AFFILIATION/INSTITUTION:

Department of Optics and Photonics, Wrocław University of Science and Technology, Wrocław, Poland

POSTER**KEYWORDS:**

Accommodation; biometry of the eye

CONTENT OF THE ABSTRACT:

The purpose of this study is to evaluate the anterior segment parameters as effect of an accommodation induced by a short-time smartphone working in a group of healthy, non-presbyopic adult patient. The preliminary study included analysis of the anterior chamber depth (ACD), the anterior chamber volume (ACV), the pupil diameter (PD), and the anterior chamber angle (ACA). Additionally, basic parameters of visual quality, such as visual acuity, and accommodative abilities were assessed.

PRESENTING:

Magdalena Kalisiak

TITLE OF SPEECH:

Assessment of myopia management options for an antimetropic patient

AUTHORS:

Magdalena Kalisiak¹, Justyna Szczapa-Jagustyn¹, Anna Chmielarz-Czarnocińska²

AFFILIATION/INSTITUTION:

1 St Wojciech's Hospital Ophthalmology, Poznan 2Department of Ophthalmology, Poznan University of Medical Science

POSTER**KEYWORDS:**

Antimetropia, anisometropia, myopia control, myopia management

CONTENT OF THE ABSTRACT:

Antimetropia, a specific type of anisometropia where one eye is hyperopic whereas the other is myopic, is prevalent in up to 0.1 per cent of large student populations.

This case study presents an 11-year-old girl who presented to the ophthalmology clinic for her first ophthalmological and optometric examination. Cycloplegic refraction revealed antimetropia OD -1,50 cyl -0,50 ax 50 OS +1,25 with an axial length of the right eye 1.19 mm higher than in the left eye. Detailed ocular health examination, tonometry, OCT and corneal topography did not reveal any abnormalities.

The child was prescribed full-time spectacle correction and was signed up for a follow-up visit in 6 months' time for an assessment of axial length progression and a full eye health examination.

This case prompted the authors to analyze myopia management options available for antimetropic patients. The poster will present options of myopia control in this case, and evaluate its pros and cons in the light of current research.

A study of scientific research in this field shows that most of the currently used methods (defocus spectacle lenses, dual focus contact lenses, low-dose atropine) have not been scientifically investigated in the case of antimetropic patients. A few studies have focused on the OrtoK use in antimetropia. There has also been one study demonstrating the efficiency of monocular use of atropine 1% drops.

In conclusion, our case study reveals that although much research has been conducted on myopia management, some on myopic anisometropia, antimetropia correction, as the rare case, still has not been sufficiently investigated and it poses a challenge to provide the patients with the correction that could slow myopia progression and potentially prevent the enlargement of the amount of anisometropia between the two eyes.

PRESENTING:

David Berkow

TITLE OF SPEECH:

Red-Light Therapy- A New Myopia Management Intervention

AUTHORS:

Dr. David Berkow

AFFILIATION/INSTITUTION:

Department of Ophthalmology, Rambam Health Care Campus, Haifa, Israel.

ORAL PRESENTATION**KEYWORDS:**

Repeated Low-level Red-Light Therapy (RLRL) is a revolutionary, recently revealed intervention

CONTENT OF THE ABSTRACT:

Disclosure:

I have no financial interest in the device.

Background:

According to Holden et al., 2016 the prevalence of myopia and high myopia will increase in numbers to 5 billion people and 1 billion people, by 2050, respectively [1]. Therefore, eye care practitioners must try to

reduce these numbers, as best as possible, by using proven evidence -based interventions to manage myopia. There are numerous interventions available.

Topic:

Repeated Low-level Red-Light Therapy (RLRL) is a revolutionary, recently revealed intervention [2].

Content:

The purpose of this presentation is to explain this form of therapy as an alternative treatment for myopia control in children, based on the literature available to date. This intervention for myopia management is based on the use of a desktop light therapy device namely, "Eyerising Myproclear" Myopia Management Device. It emits red light and is intended for use at home under parental supervision. I will explain in detail the duration of each treatment session and the recommended frequency for using the device. This device has been in use for the treatment of amblyopia, in China [2]. The treatment plan will be explained in detail [2,3].

Results:

There are interesting results from the study done by Xion Ruilin et al., 2022 which shows that there is no thinning of the macular choroidal thickness after being exposed to RLRL [4].

Conclusions:

We must ask ourselves whether it's premature to celebrate. There is some controversy over the safety of the device which will be described [5,6,7].

This presentation will show both sides of the RLRL device (advantages and safety skepticism) which has been published to date.

References:

1. Holden B.A., Fricke T.R., Wilson D.A., Jong M., Naidoo K.S., Sankaridurg P., Wong T.Y., Naduvilath T.J., 2016. Global Prevalence of Myopia and High Myopia and Temporal Trends From 2000 through 2050. *Ophthalmology*. 123: 1036-1042.
2. Jiang Y., Zhu Z., Tan X., Kong X., Zhong H., Zhang J., Xiong R., Yuan Y., Zeng J., Morgan I.G., He M., 2022. Effect of Repeated Low-level Red-Light Therapy for Myopia Control in Children. *Ophthalmology*.129: 509-519.
3. www.eyerisingmyproclear.com
4. Xiong R., Zhu Z., Jiang Y., Wang W., Zhang J., Chen Y., Bulloch G., Yuan Y., Zhang S., Xuan M., Zeng J., He M., 2022. Longitudinal changes and predictive value of choroidal thickness following repeated low-level red-light therapy. *Ophthalmology*. <https://doi.org/10.1016/j.ophtha.2022.10.002>
5. Freitas de Freitas L., Hamblin M.R., 2016. Proposed Mechanisms of Photobiomodulation or Low-Level Light Therapy. *IEEE J Sel Top Quantum Electron*.22 (3).1-37.
6. Zein R., Seltng W., Hamblin M.R., 2018. Review of light parameters and photobiomodulation efficacy: dive into complexity. *Journal of Biomedical Optics*. 23(12), 120901-1 to 120901-17.
7. Tang J., Liao Y., Dereje S.B., Wang J., Luo Y., Wang Y., Zhou W., Wang X., Wang W., 2023. Efficacy of Repeated Low-Level Red-Light Therapy for Slowing the Progression of Childhood Myopia: A Systematic Review and Meta-analysis. *American Journal of Ophthalmology*. 252: 153-163."

PRESENTING:

David Berkow

TITLE OF SPEECH:

Fitting Corneal Rigid Contact Lenses-What Have We Lost-The art or the Science?!

AUTHORS:

Dr. David Berkow

AFFILIATION/INSTITUTION:

Department of Ophthalmology, Rambam Health Care Campus, Haifa, Israel.

ORAL PRESENTATION

KEYWORDS:

Fitting Corneal Rigid Contact Lenses-What Have We Lost-The art or the Science?

CONTENT OF THE ABSTRACT:

Background:

As early as 2003, Nathan Efron observed that the fitting of rigid contact lens had decreased to only 10% of all new contact lens fittings. Nathan Efron felt that by the year 2010 rigid contact lens fitting would be almost non-existent. This is quite astounding knowing that just in 1970 nearly 100% of new fits were rigid lens fits [1]. In his 2010 article, Nathan Efron highlighted ten reasons why rigid lenses were no longer being fitted as commonly as in the past [2]. Having said this there are many reasons to fit rigid contact lenses [3].

Topic:

We should not forget that fitting corneal rigid gas permeable lenses (RGPs) is not a module of the past. It remains an important modality and holds a valuable place in the contact lens fitter's toolkit.

Content:

This presentation will delve into the art and science of rigid corneal lenses covering the use of trial sets or relying on empirical lens fitting [4]. The reasons for fitting rigid corneal lenses will be discussed. This will encompass vital fitting procedures to achieve correct alignment between the contact lens and cornea, including the use of fluorescein. Additionally, it's crucial to discuss proper after care procedures to prevent any complications arising from lens wear.

Results:

The presentation will illustrate that the fitting of RGPs is an important modality and should not be forgotten or disregarded even today when there are many other options. Although around the world, most new lens fits are soft contact lenses 8% of new fits are RGP lenses and there are a high percentage of RGP lens refits [5]. Orthokeratology is a modality where we commonly fit RGP lenses (even though scleral lens fitting is in its initial phase). In early cases of keratoconus RGP lens fitting is favourable. The manufacturing technology of RGP's has progressed from lenses being hand-made to computer designed lenses has made room for far more lens designs, sizes shapes and refractive options [6].

Conclusions:

Is fitting RGPs an art or a science or perhaps both?! [7]. Art is defined as "the expression or application of human creative skill and imagination, typically in a visual form" [8]. Science "involves a pursuit of knowledge covering general truths or the operations of fundamental laws" [9]. Therefore, fitting rigid gas permeable lenses is both an art and a science.

References:

1. Efron N., 2003. The Case Against Rigid Contact Lenses. *Eye and Contact Lens*. 29(IS): S122-S126.
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PRESENTING:

Kevin Willeford

TITLE OF SPEECH:

Dynamic exam behaviors differ across performance cohorts

AUTHORS:

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AFFILIATION/INSTITUTION:

NOVA Southeastern University

POSTER**KEYWORDS:**

Academic performance, score prediction, teaching interventions

CONTENT OF THE ABSTRACT:**Purpose:**

Examining how optometry students' within-exam dynamics correlate with their performance is crucial. This is because common archetypes, such as students who leave quickly after giving up or performing exceptionally well, show that exam duration alone is insufficient to explain performance. Thus, there is a need to further explore a student's exam taking behaviors. After categorizing exam takers into low, middle, and high scoring cohorts, we analyzed both "coarse" (i.e., exam duration and velocity) and "granular" (i.e., answers changed) factors to determine whether these metrics are predictive of performance.

Methods:

We analyzed the within-exam behavior of 295 students who had taken a comprehensive examination consisting of 370 multiple-choice items. Exam snapshots (ExamSoft™), time-stamped logs containing item-related actions (e.g., selecting or changing an answer), were downloaded and analyzed in MATLAB™. We divided students into three performance-based quantiles and then compared the average exam duration (min), velocity (points/min), and pattern of answer changes amongst the cohorts.

Results:

The low, middle, and highest scoring cohorts had performances ranging from less than 46%, between 46 to 55%, and greater than 55%. A one-way ANOVA revealed a significant effect of cohort on both exam duration and velocity: the highest scoring cohort spent the longest to complete the examination and had the highest exam velocities whereas the lowest scoring cohort finished earliest and had the lowest velocities. Two-way ANOVAs investigating the effect of cohort and switch type (positive: net gain, negative: net loss) on the relative number of switches and switch time showed that answer changes tended to garner points for all cohorts and that the relative time at which answer changes occurred were independent of a student's ultimate performance.

Conclusions:

The increase in both exam duration and velocity across cohorts shows that higher performing students "hang in" longer, and accumulate points faster, during exams. This supports investigations which have found that better performing students "warm up" and continue to do better when multiple exams are closely spaced together. Thus, whereas developing endurance-based interventions may be ideal for lower performing students, encouraging students to change their answer is typically a score-increasing strategy for all cohorts.

PRESENTING:

Anna Boguta

TITLE OF SPEECH:

Analysis of Vision Screening Results in Teenagers in Poland

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POSTER**KEYWORDS:**

Myopia, vision screening, accommodation, teenagers

CONTENT OF THE ABSTRACT:**Purpose:**

Nowadays, teenagers spend 5-8 hours daily on electronic devices [1], impairing accommodation and raising myopia risk. Regular eye exams are essential for early detection, preventing severe issues, and ensuring proper visual development critical for education. This study aimed to identify vision problems impacting Polish children completing early school education.

Methods:

The study included 41 children (20 girls, 21 boys) aged 13.8 ± 0.5 years. Morning exams assessed visual acuity (with/without +1.00D lens), cover test, Worth's test, color and stereoscopic vision, near point of accommodation and convergence, and accommodation efficiency. Six children wore corrective lenses, five for myopia. Myopia was defined as visual acuity less than 1.0 in one eye and significant decrease with +1.0D lens, per Scandinavian criteria [2]. Accommodation issues were noted if the near point exceeded 8.7 cm or efficiency was below 5 cycles/min.

Results:

The study found 68.3% of children were myopic, 9.8% hyperopic, and 21.9% emmetropic. Five myopic children had corrected visual acuity (V_{cc}) above 1.0 with their lenses. The average near point of accommodation, shown in Figure 1, was 12.3 ± 6.0 cm monocularly and 11.7 ± 5.4 cm binocularly, both below the expected norm. Some children had a near point around 20 cm, typical for a 40-year-old. Accommodation issues were identified in 70.7% of children, with a near point at or beyond 8.7 cm.

Mean accommodation efficiency was 9.7 cycles per minute, with six below the norm (5 cycles). The mean near point of convergence was 6.3 ± 2.4 cm, indicating convergence insufficiency (>5 cm [3]). 14.6% had exophoria, with a mean near point of convergence of 7.8 ± 1.1 cm.

Conclusions:

In 2005, myopia prevalence among Polish children was 16.94% [4]. Our study found it at 68.3%, emphasizing the need for regular vision screening. Such screenings are vital for early detection and can improve preventive programs and pediatric healthcare. Despite limited preliminary tests, 36 children (87.8%) were referred to specialists for issues like reduced visual acuity, poor accommodation amplitude, convergence insufficiency, heterophoria, or low accommodation efficiency.

PRESENTING:

Beata Lewandowska

TITLE OF SPEECH:

Netarsudil for the treatment of bilateral corneal edema in a 97-year-old male with Fuchs' corneal dystrophy

AUTHORS:

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AFFILIATION/INSTITUTION:

Nova Southeastern University

POSTER**KEYWORDS:**

Fuchs' endothelial corneal dystrophy, netarsudil, corneal edema

CONTENT OF THE ABSTRACT:

Netarsudil has emerged in the literature as a promising treatment option for corneal edema associated with Fuchs' endothelial corneal dystrophy. We present a case of a 97 year old male who presented with decreased best-corrected acuity in both eyes due to bilateral corneal edema associated with Fuchs' endothelial corneal dystrophy. Following the AAO guidelines, the patient was started on sodium chloride 5% ophthalmic solution QID OU and ointment at bedtime OU. On the follow up visit there was improvement in corneal haze but not in the corneal thickness OU. Netarsudil 0.02% ophthalmic solution was added at bedtime OU. On the subsequent follow up there was a significant improvement in central corneal thickness OU. Most common potential undesirable side effects of netarsudil application will also be discussed.

PRESENTING:

Maciej Perdziak

TITLE OF SPEECH:

Oculomotor impairments in children with Fetal Alcohol Spectrum Disorder (FASD)

AUTHORS:

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POSTER**KEYWORDS:**

Fetal Alcohol Syndrom, saccadic eye movements, oculomotor control

CONTENT OF THE ABSTRACT:

Aim:

Prenatal exposure to alcohol may seriously affect central nervous system development (including brain structures involved in eye movements control) and can result in a spectrum of neurological abnormalities including oculomotor control. Several previous studies showed that with respect to saccadic eye movements, children with Fetal Alcohol Spectrum Disorder (FASD) may show increased reaction time (latency), altered accuracy or increased error rate in antisaccade task.^{1,2,3} The primary aim of this study was to investigate the impact of FASD on saccadic reaction time and direction error rate during the antisaccade task.

Methods:

Ten children with FASD (7 females; 12.3 +/- 1.63 years of age) and nine control subjects (7 females; 12.89 +/- 1.69 years of age) were recruited. All subjects underwent optometric as well as ophthalmic examination before the eye movements recording. Horizontal (10 deg) antisaccades were recorded binocularly by the use of Saccadometer device (Ober Consulting, Poland) which utilizes direct infrared oculography. Red laser spots were used as a visual stimuli for saccades. Subjects were instructed to look away from a peripheral target (antisaccade task) and were seated in front of the white wall at the distance of 2.5m. All participants performed the antisaccade task consisting of 80 trials.

Results:

The independent sample t-test was used to compare both groups. Children with FASD had comparable saccadic latency to control subjects (mean +/- SEM: 330,7 ms +/- 17,03 ms vs. 313,22 ms +/- 14,15 ms, respectively; $t = -0.779$; $df = 17$; $p = 0.4467$). With respect to direction error rate, children with FASD showed increased percent of direction errors in antisaccade task (mean +/- SEM: 70.4 % +/- 4.7 % vs. 39.4 % +/- 6.9 %, respectively ; $t = -3.746$; $df = 17$; $p = 0.0016$).

Conclusions:

The results from this pilot study suggest that prenatal exposure to alcohol may affect voluntary oculomotor control. FASD children had reduced ability to suppress the automatic saccadic responses and to generate volitional saccade away from the target according to the instructions. Thus, one may speculate that FASD affects normal brain development and impairs executive processes related to eye movements control.

PRESENTING:

Oliwia Kaczkoś

TITLE OF SPEECH:

Seeing the invisible: two-photon vision and its contrast sensitivity function

AUTHORS:

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POSTER**KEYWORDS:**

Two-photon vision, infrared vision, contrast sensitivity, laser beam

CONTENT OF THE ABSTRACT:**Purpose:**

Two-photon vision relies on the perception of light from pulsed near-infrared lasers, due to two-photon absorption occurring in visual pigments [1]. This effect has been studied mainly in the context of measuring visual threshold and microperimetry [2–4]. Investigating the two-photon vision is needed to better understand the phenomenon and find more potential applications. This study compares contrast sensitivity function (CSF) for one- and two-photon vision.

Method:

The study involved six healthy volunteers aged 26–46. CSF was measured for eight spatial frequencies using the tumbling E letter optotype. The optotype was projected by fast scanning onto the retina with pulsed 1040 nm (IR) or 520 nm (VIS) laser beams, both perceived as green. The contrast threshold was determined as the power of the beam corresponding to a minimum stimulus brightness for which the subject could state the correct letter orientation. The threshold contrast values were defined as

Weber contrast. The contrast sensitivity function requires knowledge of background luminance as well as the stimulus. Because there is no spectral sensitivity function $V(\lambda)$ for the infrared range, an additional brightness-adjustment method was proposed to determine the luminance of the infrared stimulus. Approval for the study was obtained from the Bioethics Committee of the Collegium Medicum, Nicolaus Copernicus University.

Results:

The method enabled the assessment of the contrast sensitivity function (CSF) for two-photon vision and its comparison with the standard CSF. After applying such a method, the two-photon stimuli demonstrated better contrast compared to one-photon stimuli, especially for low and medium spatial frequencies. CSF values for VIS and IR for the two highest measured spatial frequencies are approximate, which may be related to the resolution limit of the optical system.

Conclusions:

Proposed approach allowed for the determination of the values of two-photon stimulus luminance and contrast sensitivity function, which appears to be higher than that for standard vision. It may be related to the more precise, well-localized, stimulation of photoreceptors in two-photon vision. The obtained results are important, for example, in assessing the applicability of two-photon vision in AR/VR displays.

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