



European Academy of
Optometry and Optics

20
25

EAOO 2025 ANNUAL CONFERENCE
LJUBLJANA 16-18 MAY 2025:

Innovative Eye Care for Life

BOOK OF ABSTRACTS

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INFORMATION ABOUT THE CONFERENCE

THE ORGANIZERS



European Academy of
Optometry and Optics



DRUŠTVO OČESNIH OPTIKOV SLOVENIJE
OPTICAL ASSOCIATION OF SLOVENIA

IN PARTNERSHIP WITH



European
Council of
Optometry
and Optics



AMERICAN ACADEMY
of OPTOMETRY

CHAIRMAN OF THE PROGRAM COMMITTEE

Daniela Nosch, Chairman of EAOO Educational Committee, Switzerland

PROGRAM COMMITTEE MEMBERS

From the European Academy of Optometry and Optics

- Alejandro Cerviño, Spain
- Maria Guilia Muzzi, Italy
- Dominique Meslin, France
- Dinah Paritzky, Israel
- Georg Scheuerer, Germany

From the Optical Association of Slovenia

- Dragica Kosec
- Matjaz Mihelcic
- Emil Oblak
- Matic Vogric

PEER-REVIEW EVALUATION PANEL

- David Berkow, Israel
- Alejandro Cerviño, Spain
- Ignacio de Costa Gonzalez, Spain
- Ving Fai Chan, Ireland
- Bruce Evans, United Kingdom
- Liat Gantz, Israel
- José M. González Méijome, Portugal
- Maurice Heunen, Netherlands
- Gabriëlle Janssen, Netherlands
- Dragica Kosec, Slovenia
- Eva Lazuka-Nicoulaud, France
- Rupal Lovell-Patel, United Kingdom
- Ed Mallen, United Kingdom
- Dominique Meslin, France
- Langis Michaud, Canada
- Matjaz Mihelcic, Slovenia
- Rabia Mobeen, Australia
- Maria Giulia Muzzi, Italy
- Shehzad Naroo, United Kingdom
- Daniela Nosch, Switzerland
- Emil Oblak, Slovenia
- Daniela Oehring, United Kingdom
- Dinah Paritzky, Israel
- David Parkins, United Kingdom
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- Nicholas Rumney, United Kingdom
- Georg Scheuerer, Germany
- Helmer Schweizer, Switzerland
- Einat Shneor, Israel
- Cesar Villa Collar, Spain
- Esther-Simone Visser, Netherlands
- Matic Vogric, Slovenia
- Sonja Zinken, Netherlands

THE WORDS OF THE PRESIDENTS

Welcome Message from the President of the European Academy of Optometry and Optics (EAOO)



Rupal LOVELL-PATEL

President, European Academy of Optometry and Optics, United Kingdom

Vision Sciences, School of Medicine and Dentistry, University of Lancashire, Preston, UK

RLovell-Patel@uclan.ac.uk

Dear Esteemed Colleagues,

It is with great pleasure that I welcome you to the EAOO Ljubljana 2025 Conference, a premier international gathering in the field of optometry and optics in Europe. I extend my sincere gratitude to our gracious hosts, the Optical Association of Slovenia (DOOS), for their unwavering support and diligent efforts in organizing this year's event. Amidst the bustling schedule, I encourage you to take a moment to explore the beauty of Ljubljana.

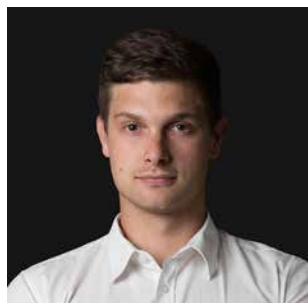
This year's conference theme holds relevance to our profession. In an era defined by rapid technological advancements and evolving healthcare landscapes, staying updated on the latest trends and innovations in eye care is paramount. "Innovative Eye Care for Life" embodies the integration of technological breakthroughs and collaborative practices aimed at enhancing patient care and outcomes. It underscores our commitment to advancing the practice and study of optometry and optics, propelling our profession into a forward-thinking direction. Factors such as accelerated digitalization, emerging AI technologies, industry innovations, and societal challenges like myopia, economic fluctuations, and refugee crises significantly influence the landscape of optometry and optics across Europe. The concept of Lifelong Care emphasizes collaboration among various healthcare professionals to ensure comprehensive and coordinated patient care. It acknowledges that optimal outcomes are often achieved through a team-based approach where professionals share insights, information, and responsibilities.

I trust that you will have a highly enriching learning experience while forging new professional connections during the conference.

Yours sincerely

Rupal

Welcome message from the President of Optical Association of Slovenia



Matic VOGRIC, Slovenia

President, Optical Association of Slovenia

Očesna Optika Vogrič, Idrija, Slovenia

matic.vogric@smart-optometry.com

Dear Colleagues and Friends,

It is with great pride that I welcome you to the EAOO Ljubljana 2025 Conference, co-organized by the Optical Association of Slovenia (DOOS). Hosting this prestigious event in Slovenia is not just an honor but also a testament to our country's growing role in the development of optometry and optics.

Slovenia, positioned at the heart of Europe, has long been a bridge between different cultures, knowledge, and expertise. Ljubljana, our charming capital, embodies this spirit—blending rich history with innovation, making it the perfect setting for this year's conference.

The EAOO Conference is more than just a meeting; it is an opportunity to exchange ideas, acquire new skills, and stay ahead in an ever-evolving field. As eye care professionals, we face rapid advancements in technology, changing patient needs, and new challenges in healthcare. This event provides a unique platform to learn from leading experts, engage in discussions that shape our profession, and build meaningful connections with colleagues from across Europe and beyond.

Beyond the sessions, I encourage you to explore Ljubljana's vibrant atmosphere, enjoy its hospitality, and take part in the energy that makes this city so special.

Welcome to EAOO Ljubljana 2025—I look forward to an inspiring and rewarding conference with all of you!

Yours sincerely,

Matic

THE CONFERENCE PARTNERS

PLATINUM PARTNER



GOLD PARTNERS



SILVER PARTNERS



BRONZE PARTNERS



EXHIBITORS



THE WORDS FROM THE MAIN PARTNERS

HOYA, PLATINUM SPONSOR



HOYA Vision Care is proud to support the 16th Annual EAOO conference in Ljubljana, Slovenia, as a Platinum Sponsor.

For over 60 years, HOYA Vision Care has been a global leader in the spectacle lens industry, dedicated to providing innovative vision care solutions for every stage of a patient's life. With a presence in over 50 countries, HOYA Vision Care holds a leading position in the myopia management category and has proven expertise in advanced lens designs, high-performance photochromic technologies, and high-quality AR coatings.

HOYA Vision Care invites optometrists, opticians and students attending EAOO to participate in their special symposium on MiYOSMART and a workshop on pre-presbyopia. You are also invited to discover new innovations in instruments by the company, that cater to a very important audience. Find us at our booth to learn more.

"At HOYA Vision Care, our vision is to improve life through vision. By collaborating with Eye Care Professionals globally, we strive to be their trusted partner. Together, we aim to expand our global footprint, drive impactful change, and create more opportunities for our people, partners, and communities. This commitment enables us to fulfill our mission of providing sustainable vision correction and protection for everyone, throughout their lifetime and we achieve this through our culture of continuous innovation." said John Goltermann Lassen, CEO of HOYA Vision Care.

HOYA Vision Care remains committed to strengthening its market position in Myopia Management and delivering innovative and competitive technologies such as high-performing photochromic materials, lens designs, and coatings, while ensuring a high level of service reliability. As a trusted ally to Eye Care Professionals globally, HOYA Vision Care leads the way in optical innovation and excellence. With large-scale production facilities in Asia, Europe, and the US, and 38 local Rx laboratories globally, the company is 20,000 employees strong. For more information, please visit <https://www.hoyavision.com/>.

ESSILORLUXOTTICA, PLATINUM SPONSOR

EssilorLuxottica

Proud to partner with the European Academy of Optometry and Optics as a platinum sponsor

EssilorLuxottica is proud to continue its decade-long collaboration with the European Academy of Optometry and Optics (EAOO) as a platinum sponsor for its 16th annual conference. We look forward to sharing our expertise in myopia management, focusing on strategies to help delay onset and slow the progression of myopia in children. Additionally, we will present academic sessions on progressive addition lens personalization, sunlight management, and subjective refraction techniques for children. Together with EAOO, we aim to address global eye care challenges and improve patient outcomes.

EssilorLuxottica is a global leader in the design, manufacture and distribution of advanced vision care products, eyewear and med-tech solutions. Its Mission is to help people around the world to see more and be more by addressing their evolving vision needs, personal style aspirations and desire to feel more connected to the world around them. EssilorLuxottica is home to the most innovative lens technologies, including Varilux, Stellest and Transitions, iconic brands such as Ray-Ban, Oakley and Supreme, the most desired luxury licensed brands and world-class retailers including Sunglass Hut, LensCrafters, Vision Express and Apollo. Backed by robust R&D investments, distinctive capabilities and a top-quality asset portfolio, the Company drives innovation across categories, from cutting-edge medical instruments and solutions for eye health to category-defining smart glasses, all of which push the boundaries of the industry and reimagine the eyes as a gateway to new possibilities. With over 200,000 employees across 150 countries, 600 operations facilities and 18,000 stores, the Group generated consolidated revenue of Euro 26.5 billion in 2024. Its OneSight EssilorLuxottica Foundation has given access to sustainable vision care to nearly 1 billion people in underserved communities.

THE CONFERENCE PROGRAMME

Day 1: May 16th, 2025

Room E1

09:00 – 10:30

Workshop 1: Pre-Presbyopia: A new category in vision care and identifying the need for early solutions
by Maarten Brouwer

Room M1

09:00 – 10:30

Workshop 2: Selling the truth – refractive surgery pros and cons
by Damjan ZUNIC

Room M3

09:00 – 10:30

Workshop 3: Mastering binocular vision evaluations: Practical techniques and time-saving tips
by Benjamin Winters

Room E5

09:00 – 13:00

Fellow Interviews

Break

11:00 – 12:30

Workshop 4: Integrating Miller's Pyramid and Harden's ladder for effective assessment and interdisciplinary learning
by Irene Ctori & Michelle Hennelly

11:00 – 12:30

Workshop 5: Innovative approaches to Myopia management
by Síofra Harrington

11:00 – 12:30

Workshop 6: Analysis of clinical cases for optometrists
by Zane Jansone-Langina

Break

Linhart Hall

14:00 – 14:20

Welcome Session
by Rupal Lovell-Patel (EAOO President) and Matic Vogrič (President Slovenian association)

14:20 – 15:20

Keynote: Multidisciplinary approach to binocular vision examination
by Dr. Jennifer Simonson

15:20 – 15:50

Management of esophoria and esotropia patients
by Christine Allison

15:50 – 16:20

Binocular treatments of amblyopia
by Guy Barnett-Itzhaki

16:20 – 16:30

Discussion

Kosovel Hall

14:00 – 15:20

No paralell activities

15:20 – 16:30

Rapid Fire Session I: Anterior Eye And Contact Lens

- **Corneal nerve morphology and ocular surface sensitivity in dry eye disease.**
by Emanuele Käser (RF1)
- **Identification of behavioral and clinical risk factors for dry eye disease: Preliminary findings.**
by Reut Ifrah (RF2)
- **Long-term results of MyoRing implantation in patients with Keratoconus.**
by Farshid Karimi (RF3)
- **Long-term impact of daily disposable hydrogel soft contact lens wear on corneal endothelium in children.**
by Marie Chanu (RF4)
- **Condition of monthly replacement lenses following a four-week wear period using multipurpose and hydrogen peroxide solutions.**
by Lindsay Rountree (RF5)
- **Association between soft contact lens decentration and scleral shape.**
by Giancarlo Montani (RF6)
- **Keratoconus and CXL treatment: When to prescribe post-operatively?**
by David Friem (RF7)

Coffee Break, Posters and Exhibition

Linhart Hall

17:00 – 17:30

Astigmatism and accommodation disorders in school-age children

by Evita Kassaliete

17:30 – 18:30

American Academy of Optometry – EAOO Joint Symposium Paediatric Contact Lenses

by Jeffrey Walline and Kristina Mihic

Kosovel Hall

17:00 – 17:30

Sponsor Lectures

by AmblyoPlay & CooperVision

17:30 – 18:30

Rapid Fire Session II: Education And Pathology

- **What is the impact of small group teaching using case-based learning (CBL) on Optometry students' knowledge of binocular vision?**
by Catherine Porter (RF8)
- **The impact of active learning in Optometric education.**
by Dinah Paritzky (RF9)
- **What peer reviewed evidence underpins teaching, learning and assessment in optometric education?**
by Catherine Porter (RF10)
- **“LEERafdeling – The Learning Department” – new concepts in multidisciplinary optometric and ophthalmological education.**
by Sigrid Mueller-Schotte (RF11)
- **Selective blue-violet light filtering lenses protect retinal cell aging under sunlight-induced cell damage.**
by Roshni Samra (RF12)
- **Visual electrophysiology as a key tool in Ophthalmology.**
by Luz Amaro-Quireza (RF13)

18:30

Poster Viewing And Conference Get Together in the Exhibition area

Day 2: May 17th, 2025

Linhart Hall

09:00 – 09:30

Review of the role of accommodation and binocular vision in myopia onset and progression

by Bruce Evans

09:30 – 10:00

Myopia: Risks for the eyes

by Hans-Jürgen Grein

10:00 – 10:30

Innovations in optical myopia management

by James Wolffsohn

10:30 – 11:00

Myopia management: Challenges in daily and professional life

by Matic Vogrič

Kosovel Hall

09:00 – 10:30

Student Researcher And Early Career Researcher Session

- **Efficacy of school-led vision checks in secondary-school students within the UK.**
by Cheralynn Saunders (EC1)
- **Retinal nerve fibre layer and ganglion cell layer thinning in children with cerebral visual impairment compared to controls.**
by Jannet Philip (EC2)
- **Influence of different types of astigmatism on myopia progression in children wearing defocus incorporated multiple segments spectacles.**
by Jenna Hoogendoorn (EC3)
- **Vision-related quality of life in patients suffering from coexisting glaucoma and cataract.**
by Mobina Farahani (EC4)
- **Seasonal differences in axial elongation in young adults.**
by Sophie Coverdale (EC5)
- **Application of an ultrasound massage device for dry eye disease.**
by Susann Köhler (EC6)
- **Evaluation of new methods for subjective refraction in times of digital change.**
by Irina Jemelín (EC7)
- **Evaluating refractive error prevalence in children in Europe: A comparative analysis of cycloplegic and non-cycloplegic studies.**
by Megan Doyle (EC8)
- **Plusoptix A04 accuracy measuring interpupillary distance and pupil size.**
by Sofía Rendo González (EC9)

10:30 – 11:00

Rapid Fire Session III: Optics & Technology

- **Personalisation: Why it matters with progressive addition lenses?**
by Meena Puar (RF14)
- **Factors influencing the return of eyeglasses to optical store.**
by Zane Jansone-Langina (RF15)
- **Sponsor Lecture: MyoControl Individual: Advanced Defocus Spectacle Lenses for Myopia Control**
by Dejan Aljančič, CEO of Alcom

Coffee Break, Posters and Exhibition

Linhart Hall

11:30 – 12:00

Glaucoma diagnosis and management through case studies

by Brett Bence

12:00 – 12:30

Vision and brain injury: Typical symptoms, assessment, treatment and therapy.

by Ruth Perrott

12:30 – 13:00

Visual management of midline shift in a patient with traumatic brain injury: A case study

by Thokozile Metsing

Kosovel Hall

11:30 – 12:30

Rapid Fire Session IV: Optometric Care

- **Correcting near vision impairment and women's empowerment: A before-after mixed-methods study among older Zanzibari craftswomen.**
by Ving Fai Chan (RF16)
- **Novel affordable mobile spectacle kit as a new solution for refractive error in low- to middle-income countries.**
by Michelle Hennelly (RF17)
- **An investigation of the lived experience of children with vision impairment due to uncorrected refractive error and the impact of spectacle correction on their well-being.**
by Ving Fai Chan (RF18)
- **Prevalence and causes of visual impairment in people attending NGO-run, outreach clinics in Zambia.**
by Christopher James Davey (RF19)
- **Patient-centred care begins with a regional community of professionals.**
by Mirjam van Tilborg (RF20)
- **More technology, more innovation, less time = Optometrist burnout.**
by Lorcan Butler (RF21)

12:30 – 13:00

Sponsor Lecture: Managing Pre-Myopia and Reduction of Myopia Progression with Essilor® Stellest® lenses

by Gabi Steenbekkers & Mark Bullimore

Lunch, Posters and Exhibition

14:00 – 14:30

Discover the future of optometry: The expanding role of Optometrists in healthcare

by Mirjam van Tilborg and Gabriëlle Janssen

14:30 – 15:00

Implementing patient-centred care in Optometry: Enhancing patient outcomes and professional satisfaction

by Lorcan Butler and Mirjam van Tilborg

15:00 – 16:00

Keynote: Modern Refraction Testing: Trends and Innovations

by Prof. Hans Jürgen Grein

14:00 – 15:00

EAOO Assembly General Meeting

15:00 – 16:00

No parallel activities

Coffee Break, Posters and Exhibition

Linhart Hall

16:30 – 17:00

Visual functions in visually demanding occupations and the role of the Optometrist

by Arjan Keuken

17:00 – 17:30

Pediatric Low Vision

by Marianne Boltz

17:30 – 18:00

The impact of over-the-counter medications on accommodation of the eye

by Dharmendra Bhoola

18:00 – 18:30

Special Interest Group

BINOCULAR VISION

Kosovel Hall

16:30 – 17:00

Sponsor Lecture: Increasing biometric individualization

by Rodenstock

17:00 – 17:30

Sponsor Lecture: Exploring New Frontiers in Myopia Management with MiYOSMART

by HOYA

17:30 – 18:00

Special Interest Group

EVIDENCE BASED PRACTICE

18:00 – 18:30

Special Interest Group

EDUCATION

Room E1

17:30 – 18:00

Special Interest Group

CONTACT LENSES

18:00 – 18:30

Special Interest Group

MYOPIA MANAGEMENT

20:00

EAOO Conference Dinner – Klub Cankarjev Dom on 7th Floor Of the Conference venue

Day 3: May 18th, 2025

Linhart Hall

09:30 – 10:00

Superficial corneal nerves: Almost invisible, yet so important!

by Daniela Nosch

10:00 – 10:30

Keratoconus: Disease of a lifetime

by Langis Michaud

10:30 – 11:00

BCLA™ CLEAR Presbyopia Report: Diagnosis and evaluation

by David Berkow

Kosovel Hall

09:30 – 10:30

Rapid Fire Session V: Paediatrics

- **The dynamic optotype (Dyop): A novel visual acuity test for use in children.**
by Guy Barnett-Itzhaki (RF22)
- **Interocular asymmetries in axial length and refractive error in schoolchildren in Ireland.**
by Síofra Harrington (RF23)
- **Evaluating the novel Visual Acuity Near Distance Facility Test (VA-NDFT) in school aged children.**
by Guy Barnett Itzhaki (RF24)
- **Advancing pediatric vision care: Advancing Vision R™ – 800 technology for comprehensive eye health solutions in children**
by Gabi Steenbekkers (RF25)
- **Visual function screening in school-age children.**
by Aiga Svede (RF26)
- **Strabismus without amblyopia in children: Does it affect binocular reading speed?**
by Guy Barnett-Itzhaki (RF27)

10:30 – 11:00

Rapid Fire Session VI: Binocular Vision

- **Prevalence of amblyogenic risk factors among children aged 3.5–5.5 years in Scotland who fail their vision screening: A retrospective epidemiological study.**
by Miriam Conway (RF28)
- **Innovative strategies for diagnosing and managing accommodative insufficiency and accommodative spasm.**
by Síofra Harrington (RF29)

Coffee Break and Exhibition

Linhart Hall

11:30 – 12:00

Corneal (GP) lenses and friends for day-to-day practice
by Langis Michaud

12:00 – 12:30

Inovations in non-invasive technologies: Dry Eye, AMD, DME and ocular allergies
by Lorcan Butler

Kosovel Hall

11:30 – 12:30

Rapid Fire Session VII: Myopia

- **Vision related quality of life of myopic children using combination treatment: Atropine and defocus incorporated multiple segments spectacle lens.**
by Paloma Porras Ángel (RF30)
- **Atropine and spectacle lens combination treatment (ASPECT): 12-month results of a randomised controlled trial for myopia control**
by Rafael Bella-Gala (RF31)
- **The effectiveness of orthokeratology in the treatment and prophylaxis of the progression of uncomplicated acquired monocular myopia.**
by Spoiala Errica (RF32)
- **Eight years of performance of defocus incorporated multiple segments (DIMS) spectacle lenses: User experience and myopia management outcomes.**
by Natalia Vlasak (RF33)
- **Multi-site observational study of defocus incorporated multiple segments (DIMS) spectacle lenses in UK children: 2-year results.**
by Kathryn Saunders (RF34)
- **Advances in myopia management: Evidence-based ophthalmic Lenses Interventions.**
by David Berkow (RF35)

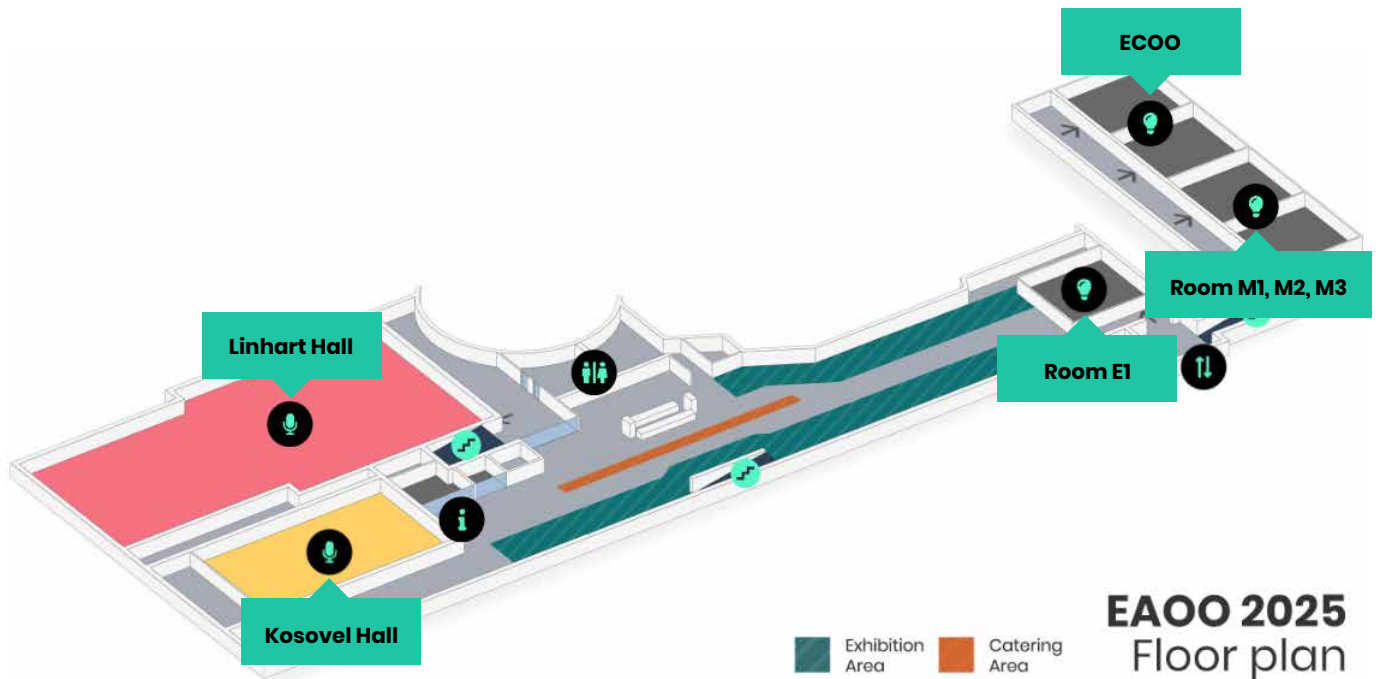
12:30

Conference Closing Ceremony, Poster Award and Photo Prize

THE CONFERENCE CENTER FACILITY

Cankarjev dom: EA00 2025 Conference Venue

Cankarjev dom is located at Prešernova cesta 10, Ljubljana, Slovenia, in a central urban area connected to established transportation networks, facilitating efficient access for participants from various regions. The venue's infrastructure is configured to support the functional requirements of scientific and technical events, offering facilities equipped with advanced audiovisual systems, modular spatial arrangements, and reliable connectivity to accommodate diverse academic and professional activities.



Travel to and around Ljubljana

How to reach Ljubljana

Plane

The local airport is the Ljubljana Jože Pučnik airport (LJU), located about 25 km from the city centre. Larger surrounding airports with good international connections are the Zagreb Franjo Tuđman airport (ZAG, 150 km) and the Venice Marco Polo airport (VCE, 230 km) or Venice Treviso airport (TSF, 220 km). Smaller surrounding airports include Klagenfurt Airport in Austria (KLU, 90 km), and the Trieste airport (TRS, 120 km) in Italy. Travel from the airport to Ljubljana city centre will, in some cases, be possible by a bus or train (you can check directions on webpages below). The most convenient way of traveling from any airport to the city centre, preferred by locals as well, is with shuttle vans organised by GoOpti and Nomago. They usually provide a range of options, balancing price with convenience. For example, a very cheap connection will be available, if a wider time window for a pick up is chosen and the journey is booked well in advance. They also offer VIP options such as a full vehicle reserved at a specific departure time. The latter option might be reasonably priced when a group of people is travelling together.

Train and Bus

Ljubljana has a central railway and bus station. Bus connections from Europe can be checked on the Ljubljana Bus Station website, or at larger bus companies operating at the station, such as FlixBus and NOMAGO. You can plan your train journey using the Deutsche Bahn website.

Public transportation

Public transfer card payment

One way public bus fare can be paid by using a payment card (Visa, Mastercard) at the validation screen upon entering the bus.

Urbana app (iOS and Android)

The public bus network in the city of Ljubljana is accessible through the Urbana system. This allows you to purchase the 'passes'. A 90-minute pass (valid for any destination on the network and any amount of bus changes) costs 1.30 EUR.

You purchase credits on the app, and must be validated on a bus terminal upon entering. This is located next to the bus driver and makes a sound when validation is successful.

Taxi

There are multiple taxi companies operating in Ljubljana with pricing relatively consistent between them. Starting and kilometre charges vary between companies and times of the day but generally range between 0.80 EUR and 1.50 EUR for the starting fee and from 0.70 EUR to 1.70 EUR per kilometre fee.

There are no ride-sharing companies (such as Uber or Lyft) operating in Ljubljana. Many taxi companies (including the larger Metro, Laguna, and Cameo) run their own booking apps which are available to download for iOS and Android devices. Most of the companies accept card payment (make sure to request this at the time of the booking) but drivers always prefer cash.

KEYNOTE LECTURES' ABSTRACTS

KEYNOTE LECTURE 1: Multidisciplinary approach to binocular vision examination



Dr Jennifer S. SIMONSON

OD, FOVDR, FAAO, Clinical director of the Boulder Valley Vision Center, Colorado, USA

drjsimonson@yahoo.com

Jennifer S. Simonson, OD, FOVDR, FAAO, is the clinical director of the Boulder Valley Vision Center in Boulder, CO. Dr. Simonson became a Fellow of the College of Optometrists in Vision Development (COVD) in 2006, which was renamed the Optometric Vision Development & Rehabilitation Association (OVDRA) in 2024. Dr. Simonson completed the Fellowship process for the American Academy of Optometry in 2023. She serves as the Chair of the International Examination and Certification Board (IECB), the Speaker Chair of the Colorado Vision Training Conference, and on the Leadership Committee of the American Academy of Optometry.

Her primary interests in practice include pediatric vision care, binocular vision, sports therapy, and vision rehabilitation. Dr. Simonson is a binocular vision specialist, working with different age groups, from toddlers and above. She is the author of several picture books for children about visual care. She was awarded the 2007 Colorado Young Optometrist of the Year. Dr. Simonson has written two textbook chapters and is the co-administrator of the VTODs (Vision Therapy Optometrists) group on Facebook with over 4,000 international members.

Abstract

This course will discuss the multidisciplinary approach to binocular vision examination including the assessment of binocular vision, accommodation, and oculomotor dysfunctions that affect visual performance, efficiency, comfort, and clarity. She will share practical tips and tricks to detect anomalies and offering insight into possible treatment options. The role of visual perception, processing, and integration will also be demonstrated with audience participation.

KEYNOTE LECTURE 2: Modern refraction testing: Trends and Innovations



Prof. Dr. Hans-Jürgen GREIN

Prof. Dr. med. Dipl.-Ing. (FH), Technical University of Applied Sciences Luebeck in Germany,
Division of Medical Optics, Germany

hans-juergen.grein@th-luebeck.de

After completing his apprenticeship as an optician, Hans-Jürgen Grein graduated with a degree in ophthalmic optics from Aalen University of Applied Sciences. He then studied medicine at the University of Würzburg, where he passed his ophthalmological training at the University Eye Clinic. He completed his doctorate on laser scanning tomography and set up a low vision outpatient clinic at the Eye Hospital. In 2001, he was appointed to a professorship in ophthalmic optics at the University of Applied Sciences in Jena, where he served until 2007. Since then, he has been a professor at the Technical University of Applied Sciences of Lübeck, working in the field of medical optics. Additionally, he is the Head of Science at the Fielmann Academy Schloss Plön. He teaches courses in general and ocular anatomy and pathology, optometry, and physiological optics. He has lectured and published extensively in the fields of optometry.

Abstract

VDetermining refraction is one of the core competences of optometry. Subjective measurement using the cross-cylinder method is still the gold standard, both in education and in practical application. New technologies have the potential to replace tried and tested refraction methods. In addition, the digital transformation under the buzzword "artificial intelligence" is clearly penetrating all areas of life. Those who do not use AI seem to be falling behind. Do we need to rethink our approach? Will traditional subjective refraction soon become obsolete? What innovative refraction methods have emerged? The lecture will provide a comprehensive overview of current developments in refraction testing.

American Academy of Optometry – European Academy of Optometry and Optics Joint Symposium



Jeffrey Walline

OD PhD, Acting Dean at The Ohio State University College of Optometry.



Kristina Mihic

MSc PhD, Guy's and St Thomas' Hospital, London

Paediatric Contact Lenses

Abstract

Contact lenses play a crucial role in paediatric eye care, particularly in cases where medical necessity and progressing refractive error dictates their use.

The session will cover two key aspects: medically necessary contact lenses and contact lenses for myopia control. Special attention will be given to evidence-based information about safety and benefits of contact lens myopia control as well as some fitting tips to make the process successful for myopic children. We will also discuss the importance of early intervention, patient selection, and the long-term impact of contact lens wear on paediatric patients.

Two case studies will illustrate the practical application of contact lenses in young patients with complex visual needs. The first case will focus on keratoconus in the paediatric population, demonstrating the challenges of early diagnosis and the benefits of contact lenses in restoring visual function. The second case will present the management of aphakia in an infant, emphasizing the role of soft lenses in visual rehabilitation and neurodevelopmental outcomes.

Attendees will gain insight into best practices for paediatric contact lens fitting, including clinical considerations, patient and parent education, and long-term care strategies. This presentation aims to provide participants with the knowledge and confidence to fit medically necessary contact lenses and manage myopia in young patients effectively.

ORAL PRESENTATIONS ABSTRACTS

Oral Presentation #1 (OP1)

Management of esophoria and esotropia patients

Author

Christine Allison

Affiliation / Institution

OD. Illinois College of Optometry, Chicago, IL, USA

callison@ico.edu

Topic

Clinical

Abstract

Purpose

A review of the most common diagnoses of patients with esophoric postures will be presented. While the prevalence of strabismus world-wide is 2-4%, some studies have shown more esotropia than exotropia in their populations.

Content

The appropriate signs and symptoms of convergence excess, accommodative esotropia, and non-accommodative esotropia will be discussed. Divergence insufficiency will also be addressed. The exam techniques to appropriately manage these patients will be reviewed.

Results

The treatment options for these types of patients, as well as management using lenses, prisms, and vision therapy will be addressed along with patient case examples. When to refer these patients for treatment and surgical intervention will also be discussed.

Conclusions

Patients with esophoric conditions are relatively common and it is important to understand the best management options for these patients. Knowing how to treat and when to refer will be important to the successful management of your patients.

Oral Presentation #2 (OP2)

Binocular treatments of amblyopia

Authors

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Topic

Clinical

Abstract

Purpose

Amblyopia, has traditionally been treated with monocular approaches. Recent advancements in binocular vision therapy have shown promise in improving outcomes. This review evaluates the long-term efficacy of binocular therapy for amblyopia treatment, synthesizing current evidence from longitudinal studies, including the Luminopia CureSight and Dig Rush studies.

Methods

A comprehensive literature search was conducted using PubMed, EMBASE, and Cochrane Library databases. Studies published between 2014 and 2024 that reported long-term outcomes (≥ 12 months) of binocular vision therapy for amblyopia were included. The primary outcome measure was change in visual acuity (VA) from baseline to final follow-up. Secondary outcomes included improvements in stereo acuity and recurrence rates.

Results

The reviewed studies demonstrate promising outcomes for binocular treatments of amblyopia, with significant improvements in visual acuity ranging from 0.09 to 0.28 logMAR across various interventions, including dichoptic training, VR-based therapies, and video game-based treatments. Long-term follow-up data, particularly from the CureSight study, indicate sustained visual acuity gains of 0.20 logMAR at 52 weeks, although a 20.6% recurrence rate was observed.

Conclusion

Binocular therapy shows promise as a long-term treatment option for amblyopia, with evidence of sustained visual acuity improvements and potential benefits for stereo acuity. Future research should focus on large-scale, randomized controlled trials with extended follow-up periods to better establish the long-term efficacy of binocular treatments compared to traditional methods.

Oral Presentation #3 (OP3)

Astigmatism and accommodation disorders in school-age children

Authors

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Topic

Clinical

Abstract

Purpose

This study aimed to investigate the relationship between astigmatism and accommodation disorders (hypofunction and hyperfunction) in school-age children. Specifically, it compared the types and axes of astigmatism (with-the-rule (WTR), against-the-rule (ATR), and oblique) across three groups: children with accommodation disorders and a control group of children with normal visual function.

Method

The study included 82 children aged 6–12 years (mean age 9 ± 2 years), with 64 participants ($n=41$ control, $n=16$ accommodation hyperfunction, $n=7$ accommodation hypofunction) after excluding those with convergence disorders. Refraction was conducted without cycloplegia, using the maximum plus and minimum minus rule with the fogging technique. Objective refraction and keratometry measurements were taken using a Huvitz Auto Ref/Keratometer HRK-1. Astigmatism axis was categorized as WTR, ATR, or oblique. Statistical analysis included Chi-squared tests, Kruskal-Wallis test, and ANOVA Multiple Comparisons Test to assess differences in total, corneal, and lens astigmatism.

Results

In the control group, ATR was most common (39%), followed by WTR (28%) and oblique (26%). In children with accommodation hypofunction, ATR was predominant (57%), while WTR was more common in the hyperfunction group (47%). Significant differences in total and corneal astigmatism were found across groups: control group ($\chi^2 = 71.90$, $p < 0.01$), hypofunction group ($\chi^2 = 10.44$, $p < 0.02$), and hyperfunction group ($\chi^2 = 19.93$, $p < 0.02$). The total cylinder axis differed significantly between the accommodation hyperfunction group ($60.93^\circ \pm 48.54^\circ$) and the control group ($80.90^\circ \pm 48.46^\circ$), with a mean difference of $19.96^\circ \pm 8.15^\circ$ (95% CI: [4.17°, 35.75°]). Significant differences were also found in lens astigmatism axis ($p < 0.0035$). The hyperfunction group tended toward oblique astigmatism in total astigmatism.

Conclusion

The axis of total and corneal astigmatism may serve as an additional indicator for identifying accommodation disorders, particularly hyperfunction, aiding in early diagnosis and intervention. Larger studies are needed to confirm these results.

Oral Presentation #4 (OP4)

Review of the role of accommodation and binocular vision in myopia onset and progression

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Topic

Research/science

Abstract

Background

Myopia is a multifactorial condition, and the predominant theory is that relative peripheral hyperopic defocus (RPHD) is a leading cause of myopia progression. However, interventions that reduce RPHD only slow progression by ~50%, so other factors are probably involved.

Methods

PubMed was searched for relevant keywords relating to research on myopia, accommodation and binocular vision in humans.

Results

The search identified 252 publications, with 29 added from bibliographies. After filtering, 108 publications were included. The CLEERE study found changes in the interaction between accommodation and convergence (AC/A ratio) from four years before myopia onset and this is thought to indicate compromised accommodation, linked to increased accommodative lag. Many studies have found myopia to be associated with increased accommodative lag, that will contribute to hyperopic defocus. However, the magnitude of accommodative lag is not correlated with rate of myopia progression. Tests of eye alignment show increased near esophoria in some myopes around the time of myopia onset. This is probably secondary to the higher AC/A ratio. Clinical trials of bifocal and progressive addition lens spectacles show disappointing efficacy (10-30%) at slowing myopia progression. Early indications of greater efficacy in myopic children with higher accommodative lag and/or near esophoria were not replicated in later trials. Considering previous reviews, the 2021 IMI review was dismissive of a role for accommodation and binocular vision in myopia development/progression, but the 2024 NASEM review argued that accommodation may play an underappreciated role.

Conclusion

It is not possible to reach firm conclusions from the literature. Although accommodative dysfunction seems to play some role in myopia onset, accommodative and binocular factors are unlikely to be major causative factors in myopia progression. Interventions that modify accommodation and binocular co-ordination are unlikely to have strong myopia control effects. An additive risk factor risk-resilience model is presented.

Oral Presentation #5 (OP5)

Myopia: Risks for the eyes

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Topic

Clinical

Abstract

This lecture will focus on the pathological changes in the eye associated with progressive myopia.

Particularly in cases of high and pathological myopia, characterized by excessive axial elongation of the eyeball, severe structural alterations occur in the posterior segment of the eye. These deformations of the sclera can lead to a range of complications, including scleral deformation, chorioretinal atrophy, and the development of staphylomas, significantly increasing the risk of severe visual impairment.

A key focus will be on myopic maculopathy, a serious retinal condition that can result in macular atrophy and choroidal neovascularization, both of which are major causes of irreversible vision loss.

Additional risks include glaucomatous optic neuropathies, which often arise from deformities of the optic nerve head, as well as an increased risk of retinal detachment, correlated with axial length elongation. The increased risk of special forms of cataract is also discussed.

The lecture will emphasize that the axial length of the eye is a critical indicator of the risk of pathological changes, whereas refractive error alone is insufficient to assess the severity of myopia.

The aim is to highlight the clinical significance of these pathological changes and the need to take advantage of the opportunity of myopia control to reduce the risks associated with high and pathological myopia.

Oral Presentation #6 (OP6)

Innovations in optical myopia management

Authors

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Topic

Clinical / research

Abstract

Eye growth and refractive development is a visually guided process, and manipulation of the retinal image can change the course of refractive development. These findings have formed the scientific basis of novel, effective myopia control optical interventions. Most optical treatment options are designed to induce relative myopic defocus. A new generation of optical treatment has been designed to lower retinal contrast to slow myopia progression. The purpose of this review is to explore the evidence base for contrast management, including how it relates to defocus-based interventions and animal models.

The potential therapeutic use of contrast management was first proposed following the discovery that familial high myopia is linked with abnormally high retinal contrast signaling. These findings led to the hypothesis that high retinal contrast, whether from genetic predisposition or the modern visual environment, may cause excessive axial length growth and progressive myopia.

Short-term studies show the choroid dynamically responds to contrast management. Long-term randomised controlled trials in North America and China have evaluated contrast management spectacle lenses that integrate thousands of light scattering elements across the lens periphery (Diffusion Optics Technology; DOT). DOT spectacle lenses effectively slow myopia progression in children from age 6 and demonstrate a similar level of efficacy to leading defocus-based interventions.

Defocus-based interventions also result in reductions in retinal contrast. New research has revealed both positive and negative peripheral defocus can control myopia progression, suggesting that defocus-based interventions may operate via contrast management.

Although contrast management for myopia control appears counterintuitive given form deprivation animal models, there are significant differences between the approaches and application to the human visual system.

In conclusion, contrast management represents an effective myopia treatment strategy. Further research is required to investigate whether contrast management is the unifying mechanism behind all optical myopia control interventions and how this affects patient management choices.

Oral Presentation #7 (OP7)

Myopia management: Challenges in daily and professional life

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Topic

Clinical

Abstract

Purpose

This overview examines the reported limitations of myopia management tools, specifically ophthalmic and contact lenses, in daily activities and professional settings. The focus is on visual challenges such as reduced visual acuity, contrast sensitivity, and difficulties encountered in night driving and sports performance. Additionally, it explores how abnormal conditions, such as Adie pupil and anisocoria, may further affect visual perception. Insights are drawn from both reported cases in the literature and practical experiences from clinical practice.

Methods

A synthesis of existing reports and practical observations from clinical practice was conducted. Common visual disturbances, including reduced contrast sensitivity, night-time haloes, and limitations in motion perception and global scene recognition during sports, were analyzed. Special attention was given to cases where conditions like Adie pupil or anisocoria influenced perception with myopia management tools. A few practical cases from daily practice are presented to illustrate these challenges.

Results

Both literature and practical cases indicate that while myopia management tools effectively slow myopia progression, they can lead to visual disturbances such as haloes during night driving and reduced performance in sports. Abnormal conditions like Adie pupil or anisocoria may further impair visual perception, causing increased sensitivity to light or uneven pupil reactions, complicating the use of these tools. Despite these challenges, the long-term benefit of myopia control continues to outweigh the functional drawbacks.

Conclusion

Myopia management tools can present limitations, including reduced visual acuity, contrast sensitivity, and complications under specific conditions, such as Adie pupil or anisocoria. However, these issues are generally manageable, and the overall benefits in preventing severe myopia progression make these tools indispensable in clinical practice, despite the observed limitations in everyday and professional life.

Oral Presentation #8 (OP8)

Glaucoma diagnosis and management through case studies

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Topic

Clinical

Abstract

Glaucoma is an optic neuropathy and leading cause of irreversible blindness in the world. In this presentation, we will discuss the primary components of an optometric glaucoma examination, following generally accepted guidelines from clinical research and glaucoma societies. We will use a stepped approach to diagnosis based on multiple factors, including: 1. pertinent history and related medical and vascular risk factors 2. intraocular pressure and corneal pachymetry 3. diagnostic automated testing of the optic disc and macular retinal nerve fiber layer 4. gonioscopy and anterior chamber angle assessment 5. visual field measurement and interpretation 6. slit lamp examination 7. ophthalmoscopy and disc assessment.

After diagnosis, we will briefly discuss management options through case studies of open angle glaucoma if treatment to lower intraocular pressure is the recommendation. Treatment strategies to lower the intraocular pressure (IOP) in a previously undiagnosed patient can include setting a target pressure and determining whether to consider selective laser trabeculotomy vs. topical IOP-lowering pharmaceutical agents. We will briefly review the topical glaucoma drug categories, their impact on aqueous production and drainage. We will discuss the conundrum of comparative change to visual field and OCT RNFL when they do not agree. As time allows, we will also touch on the highlights of the large randomized glaucoma studies that are foundations of glaucoma management. We will briefly discuss the LiGHT study and increased acceptance as an initial therapy. In summary, we will highlight a comprehensive approach to data gathering and making glaucoma diagnosis and treatment decisions.

Oral Presentation #9 (OP9)

Vision and brain injury: Typical symptoms, assessment, treatment and therapy

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Topic

Clinical

Abstract

Vision is the dominant sense in the human species and derives meaning from what we see. It is a complex, learned and developed set of functions that involve a multitude of skills, the ultimate purpose of which is to arrive at an appropriate motor and/or cognitive response. Sadly, there is an extremely high incidence (>50%) of visual and visual-cognitive disorders in neurologically impaired patients (TBI, cerebral vascular accidents, stroke, MS, etc), with the majority of individuals recovering from TBI - having binocular vision difficulties in the form of strabismus, phoria, oculomotor dysfunction, convergence and accommodative abnormalities.

Oral Presentation #10 (OP10)

Visual Management of midline shift in a patient with traumatic brain Injury: A case study

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Topic

Research/Science

Abstract

Passive and active visual rehabilitation techniques offer an effective adjunctive treatment for managing the neurological deficits associated with midline shift (MLS) in patients with traumatic brain injury (TBI), particularly for those experiencing visual disturbances like diplopia (double vision) due to shifts in brain structures. The case study used in this presentation will examine the innovative application of prism and active therapy to address both the visual and neurological symptoms related to midline shifts in a TBI patient. The presentation will provide a comprehensive overview of the neurological processing hierarchy involved in ocular motor control and the types of vision-related impairments commonly observed in patients with TBI. It will also detail the diagnostic tests used to identify visual impairments resulting from traumatic brain injuries and outline management strategies for sensorimotor vision deficits. The session aims to equip optometrists with the knowledge and tools necessary to assess and manage patients with midline shifts caused by TBI. Prism lenses with active therapy will be highlighted as an innovative and effective strategy in visual management, particularly for addressing midline shift-related symptoms in TBI patients. By improving visual alignment and alleviating diplopia, passive and active vision therapy plays a crucial role in supporting overall recovery, contributing to both neurological and functional outcomes. This case study emphasizes the importance of a holistic, patient-centered approach that integrates visual rehabilitation into the management of traumatic brain injury, showcasing the potential of interdisciplinary care to enhance recovery and quality of life in these complex cases.

Oral Presentation #11 (OP11)

Discover the future of optometry: The expanding role of optometrists in healthcare

Authors

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Topic

Education / Clinical

Abstract

Optometry is evolving, and optometrists are stepping into a more prominent role as primary care providers in eye health. Join us for an insightful presentation on this exciting transformation, where optometrists are not only performing comprehensive eye exams but are also pivotal in early diagnoses and contributing to a more efficient healthcare system.

Why attend? This presentation will delve into the opportunities and challenges of this evolving role, offering practical strategies to help you elevate your practice and skills.

Here's what we will cover:

1. Training and education: Discover why continuous learning is essential for staying current with the latest techniques, technologies, and treatments in optometry.
2. Scope of practice: Understand the importance of clearly defined clinical boundaries to ensure safe patient care and avoid legal issues.
3. Efficient referral systems: Learn how to establish a strong referral system with ophthalmologists, ensuring patients receive the appropriate care at the right time.
4. Workload and burnout: Get practical tips on managing increasing responsibilities to prevent burnout and maintain a balanced workload.
5. Building patient trust: Explore effective communication strategies to help patients understand your role and the benefits of referrals, strengthening their trust in your care.
6. Regulatory and health insurance considerations: Gain insights into navigating regulatory changes and health insurance policies as your scope of practice expands. This presentation is a must for any optometrist looking to stay ahead in their field and make a meaningful impact on patient care.

Join us and get inspired to take your role in healthcare to the next level!

Oral Presentation #12 (OP12)

Implementing patient-centred care in optometry: Enhancing patient outcomes and professional satisfaction

Authors

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Topic

Educational

Abstract

Introduction

Patient-centred care is a widely embraced approach, that places the patient at the core of their eye examination journey. This model of care prioritizes the needs, preferences, and beliefs of the patient, treating them as individuals and active partners in their own care. Given the rise of online and remote interventions, along with advancements in AI, the human element in patient encounters is increasingly valuable. This presentation explores the principles of patient-centred care in optometry and its impact on patient outcomes and professional practice.

Method

The presentation will include a review of current literature on patient-centred care in optometry, supplemented by personal case studies demonstrating practical implementation. Interactive engagement with the audience will be used to identify beneficial aspects of patient-centred care from their perspectives. The methodology involves qualitative analysis of patient and practitioner experiences to highlight best practices and areas for improvement.

Results

Preliminary findings suggest that patient-centred care leads to higher patient satisfaction, improved adherence to treatment plans, and better overall health outcomes. Optometrists who adopt this approach report greater professional fulfillment and stronger patient relationships. Key elements identified are effective communication and a holistic understanding of the patient's social, clinical, personal, and cultural needs.

Conclusion

Patient-centred care is essential for high-quality optometric practice. By treating patients as equal partners and focusing on their individual needs, optometrists can enhance patient engagement and outcomes. The presentation will provide practical strategies for incorporating patient-centred care into everyday practice, emphasizing the importance of continuous learning and adaptation to meet the evolving needs of patients.

Oral Presentation #13 (OP13)

Visual functions in visually demanding occupations and the role of the Optometrist

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Topic

Clinical

Abstract

Topic

In many (high-risk) professions, requirements and guidelines of visual functions for employment are available. Examples are the military, fire brigade, police, shipping and aviation. Visually demanding tasks are also performed in professions without specific visual requirements, such as nursing in night shifts with performance in low illuminance levels.

Content

Visual function criteria in high-risk professions often include visual acuity, contrast sensitivity, colour vision and straylight. Various factors may influence visual performance, such as age, chronic and ocular conditions, and the type of correction applied. For example, due to demographic developments, the use of multifocal contact lenses and intraocular lenses is increasingly common. These lenses may affect visual performance in different light conditions. Low illuminance levels also affect visual function; therefore, mesopic vision can be part of the visual requirements.

Actions taken

Various national and European guidelines for high-risk professions were examined. Several visual functions are described with recommended tests and threshold limits. Not all visual function thresholds for safely performing tasks are clearly defined. For example, some regulatory requirements and guidelines mention that visibility in mesopic conditions must be adequate. The absence of clear criteria may lead to questions and discussions.

Recommendations/conclusions

Optometry is a profession with expertise in visual performance, and the effect of different light conditions on visual functioning. Therefore, optometrists can contribute to testing visual functions and advising in occupational settings. This is important in professions with visually demanding tasks, with or without specific visual requirements. Furthermore, it is essential to determine visual function threshold limits for safely performing tasks when not clearly defined.

Oral Presentation #14 (OP14)

Pediatric low vision

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Topic

Clinical

Abstract

Purpose

This lecture will introduce attendees to both the low vision evaluation of infants, pre-school and school age children as well as low vision devices and rehabilitative services available to assist children in their daily lives as well as academic endeavors. There will also be discussion of the most common ocular disorders that cause vision impairment in children and how vision loss impacts their visual, physical, cognitive social development.

Methods

There will be a review of specific exam techniques most effective for the pediatric population such as visual acuity, contrast sensitivity, visual field testing, color vision testing and refraction. Diseases such as optic atrophy, congenital glaucoma, retinitis pigmentosa, cortical vision impairment, albinism, congenital nystagmus, coloboma and retinopathy of prematurity will be briefly reviewed and corresponding photographs of the conditions shown. Identification of the best low vision devices for school age children will be made, such as hand-held magnifiers, telescopes, portable digital magnifiers and CCTVs.

Results

Attendees will have a better understanding of how children become visually impaired, how to best evaluate these children in an eye care setting and what eye care providers can offer these children to be successful academically as well as become independent and productive adults.

Conclusion

It is important for optometrists and eye care providers to be able to provide quality vision care and low vision rehabilitation recommendations to children with vision impairment.

Oral Presentation #15 (OP15)

The impact of over-the-counter medications on accommodation of the eye

Author

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Topic

Clinical

Abstract

The accommodative reflex is the primary reflex that involves focusing the eyes on near objects. This reflex involves synkinesis of the accommodation-convergence reflex comprised of convergence of both eyes, constriction of the ciliary reflex as well as pupillary constriction. With the transition of man's visual needs from 3-dimensional distance visual requirements to 2-dimensional near visual requirements involving reading and computer-based tasks, the accommodative convergence has been placed under a great deal of visual stress. The autonomic nervous system forms a component of the peripheral nervous system plays an important role in the regulation of involuntary physiological processes and extends its control into vision where it plays a critical role in the regulation of the accommodative-convergence reflex. The balance between the cholinergic (parasympathetic) and adrenergic (sympathetic) divisions maintains homeostatic balance between stimulation as well as inhibition of this critical reflex.

Over the counter medications are used by patients to relieve symptoms from various conditions. It must be noted that these over-the-counter medications have the same active ingredients as prescription medications and are assumed to have lower toxicity levels due to lower dosages of these active ingredients. Optometrists needs to play a proactive role as primary eye care professionals in understanding the effects of medications affecting accommodation and more specifically the autonomic nervous system.

The goal of this presentation is review over the counter medications affecting the homeostatic balance between the parasympathetic and sympathetic balance of the accommodative-convergence reflex.

Oral Presentation #16 (OP16)

Superficial corneal nerves: Almost invisible, yet so important!

Author

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Topic

Clinical

Abstract

The human cornea is the most densely innervated tissue in the human body. Its superficial sensory nerves play an essential role in maintaining a healthy ocular surface and hence represent an important corneal health indicator: They detect foreign bodies or noxious substances, initiate basal tear film production, promote blinking, and ensure neurotrophic maintenance of the corneal epithelium.

This presentation provides an overview of the morphology of the fine structures within the human corneal intra-epithelial subbasal nerve plexus.

Studies will also be discussed, where corneal nerve function was assessed across a range of conditions, including dry eye disease, refractive surgery (both, pre- and post-operatively), keratoplasty, corneal dystrophies and degenerations, peripheral neuropathy (such as diabetes), and corneal infections.

Additionally, studies applying corneal sensitivity measurements in contact lens wear to evaluate, ischaemia, inflammatory processes and to investigate issues related to contact lens discomfort and \ / or contact lens induced dry eye will be explored.

Finally, challenges in the assessment of corneal nerve morphology and function will be addressed: In vivo confocal microscopy is challenging, as the sections of corneal nerves captured per image are small (0.4*0.4 mm²) and live eye tracking is not possible.

For corneal sensitivity measurement, two commercially available devices will be discussed: The tactile Cochet-Bonnet aesthesiometer and the Brill air jet aesthesiometer. The respective advantages and limitations, as well as other research prototypes utilising air and saline liquid jet aesthesiometers, will be examined. This comparison aims to provide a comprehensive understanding of current and emerging tools for corneal nerve assessment, highlighting their potential applications and areas for improvement in clinical and research settings.

Oral Presentation #17 (OP17)

Keratoconus: Disease of a lifetime

Author

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Topic

Clinical

Abstract

The prevalence of keratoconus is now between 1/600 and 1/1000 in general, and is even higher in certain regions of the world. Early detection of keratoconus is crucial, given that effective treatments are now available to counter its progression and maintain optimal vision and quality of life. The methods for detecting conus are presented, highlighting those that may be useful in the absence of topography, which remains the standard.

With the help of case reports, this conference describes the lifelong journey of the keratoconus, from detection at a young age, through to post-treatment needs - and the selection of appropriate visual correction methods.

The speaker then discusses the adaptations required as visual needs change, particularly with presbyopia and cataracts. The choice of an appropriate implant is then crucial for the future.

Finally, the speaker discusses how we can support elderly patients for whom traditional methods of correction are no longer an option. In particular, the importance of refraction in keratoconus patients is highlighted.

With the help of case reports, participants will understand that keratoconus is a disease of a lifetime.

Oral Presentation #18 (OP18)

BCLA™ CLEAR presbyopia report: Diagnosis and evaluation

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Topic

Clinical

Abstract

Background

The BCLA CLEAR™ (Continued Learning Evidence-based Academic Reports) initiative by the British Contact Lens Association provides a collaborative review of essential eye care research, aiming to influence and enhance global eye care practices. This presentation highlights findings from the second BCLA CLEAR™ report, consisting of nine chapters, with a focus on Chapter 2, BCLA CLEAR Presbyopia: Evaluation and Diagnosis, to which I contributed.

Content

Effectively managing presbyopia involves assessing the range of clear focus in presbyopic patients and recommending appropriate corrective techniques. Both objective techniques (such as autorefractometry, corneal topography, and lens imaging) and subjective techniques (including patient-reported outcome questionnaires and defocus curves) are crucial for evaluating, monitoring, and diagnosing presbyopia. This presentation will review subjective assessment techniques (such as questionnaires, quality-of-life metrics, and their impacts), acuity techniques (including static and dynamic visual acuity, defocus curves, and target availability), and objective techniques (such as keratometry, topography, autorefractometry, aberrometry, reading performance, contrast sensitivity, depth of field, and pupil size). Additionally, measurement methods—such as the amplitude of accommodation (AoA) and techniques for calculating near add from AoA—will be discussed. In the second part, we will address the diagnosis of presbyopia, defined as the point at which an individual's accommodation ability is insufficient to meet their near vision requirements.

Results

Objective techniques provide Eye Care Practitioners (ECPs) with reliable data on the effectiveness of optical correction, assisting in determining whether the selected approach aligns with the patient's needs. These techniques also help patients better understand their condition, fostering a collaborative approach to presbyopia management.

Conclusions

Presbyopia management is an evolving process with a range of corrective options. ECPs should prepare patients for this journey by exploring various approaches to find the optimal solution. Aging presents challenges, well-managed visual care and advancing technology can enhance the quality of life for presbyopes.

Oral Presentation #19 (OP19)

Corneal (GP) lenses and friends for day-to-day practice

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Topic

Clinical

Abstract

Professor Efron predicted the extinction of rigid contact lenses a few years ago. We have to admit that he was wrong.

Objective

The aim of this conference is to illustrate the appropriate clinical use of CR lenses in modern practice, and to review the fitting methods and ways of dealing with the most common problems.

Methods

Theoretical presentation, in part, on the optimal lens/cornea relationship, as well as on the optical aspects of CR lens correction. With the help of case histories, the lecture helps us to understand when CR lenses should be a first-line option, particularly because scleral lenses would not give the expected results or are incompatible with the patient's condition. The case of hybrid lenses and the use of the piggyback system are also discussed.

Conclusion

Fitting CR lenses may seem like a lost art. However, in many circumstances, it is a simple, effective and cost-efficient way of meeting patients' needs. This conference provides an opportunity to review their clinical use from a modern perspective.

Oral Presentation #20 (OP20)

Innovations in non-invasive technologies – dry eye, AMD, DME, ocular allergies

Author

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Topic

Clinical

Abstract

Background

With ever increasing technological advancements we are seeing huge leaps and bounds in the field of optometry & ophthalmology. This presentation will concentrate on three different ocular conditions–Dry Eye, AMD and DME.

Methods

Nano-technology eye drops for application at the anterior aspect of the eye for treatment of ocular disease at the posterior aspect in this case Diabetic Macular Oedema with Oculis eye drops which utilise nanotechnology to deliver its active ingredient Dexamethasone. We will also look at wearable technologies for the treatment of Diabetic Retinopathy through an eye mask delivering light technology such as Vileda, Espansione, and Valeda. Imaging for Ocular Allergies Anterior Segment OCT image acquisition can now detect conjunctival changes and thickening which are indicative of an allergic ocular response.

Conclusions/Recommendations

In the everchanging world of technological innovations we have a duty of care to stay abreast of clinical, pharmacological and technological changes within our space. With digital technology and digital literacy high among our community we need to ensure our knowledge exceeds theirs to retain our position of knowledge and trust.

RAPID-FIRE PRESENTATIONS ABSTRACTS

Rapid Fire Presentation #1 (RF1)

Corneal nerve morphology and ocular surface sensitivity in dry eye disease

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Topic

Anterior eye and contact lenses

Abstract

Background

Dry eye disease (DED) is a complex multifactorial condition with an incompletely understood pathogenesis. A comprehensive examination of both the functional and morphological aspects of corneal nerves could provide valuable insights into the development and progression of this disorder.

Methods

A systematic review was carried out to assess the current state of knowledge regarding corneal sensitivity and nerve morphology in DED. The analysis was restricted to studies that included a control group and was conducted adhering to the PRISMA guidelines for systematic reviews.

Results

Eighteen studies met the inclusion criteria after rigorous selection and evaluation. Of these, 13 studies utilized the Cochet-Bonnet aesthesiometer (CB), while five employed a version of Belmonte air jet aesthesiometer. With the exception of two studies, all investigations reported lower corneal sensitivity in participants with DED compared to controls. However, the heterogeneity in DED inclusion criteria and the variety of assessment methods employed make direct inter-study comparisons challenging and potentially less meaningful. The literature of corneal nerves changes in DED indicates an evidence of corneal nerve loss in affected eyes, using single in vivo confocal microscopy images.

Discussion and Conclusions

Current evidence indicates reduced corneal nerve function and impaired structure in dry eye disease. However, significant variability in study designs and methodologies emphasizes the need for standardization in DED diagnosis (e.g., adopting TFOS DEWS II definition) and assessment methods for corneal sensitivity and nerve morphology. Future research should consider describing corneal sensitivity using psychometric curves rather than threshold estimations alone. Corneal nerve morphology analysis should examine larger corneal areas to account for the inhomogeneous distribution of the subbasal nerve plexus. Addressing these methodological challenges may contribute significantly to our understanding of the relationship between corneal nerves and DED.

Rapid Fire Presentation #2 (RF2)

Identification of behavioral and clinical risk factors for dry eye disease: Preliminary findings

Authors

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Topic

Anterior eye and contact lenses

Abstract

Purpose

Dry eye disease (DED) is a common eye condition that impacts millions worldwide. This study aims to identify behavioral and clinical factors that could predict populations at risk of developing dry eye, facilitating early intervention.

Methods

Participants' measurements, including: demographic data, visual acuity, invasive and non-invasive tear break-up time (TBUT), Schirmer test, meibography, aberrometry, meibum gland (MG) secretion, staining and corneal health parameters, complete and incomplete blinks per minute during a reading task from a monitor, subjective symptoms and habits (Ocular Surface Disease Index (OSDI), MG dysfunction (MGD) questionnaire, and digital eye strain (DES) Questionnaire), were collected. Correlations were examined using Spearman tests, and comparisons between dry eye vs. non dry eye groups with Mann-Whitney tests.

Results

Of the 30 participants in this preliminary cohort (mean age: 24 ± 6 years, 19–51), 47% ($N=14$, mean age: 24 ± 8 years, 20–51) had dry eye ($OSDI \geq 13$ and $TBUT < 25\%$). Trefoil aberration differed significantly ($p=0.04$) but not clinically (both approximately $0.09 \mu\text{m}$) between dry eye and non-dry eye groups. MG loss in the lower eyelids was significantly worse in the dry eye vs. non dry eye groups (34.4 ± 17.1 vs. 22.3 ± 15.3 , $p=0.03$). MGD questionnaire and several questions from the DES questionnaire were significantly positively correlated with diagnosis of dry eye and MGD.

Conclusions

In this preliminary study, Trefoil emerged as a potential predictor for dry eye. More participants are necessary to draw conclusions and identify other risk factors.

Rapid Fire Presentation #3 (RF3)

Long-term results of MyoRing implantation in patients with keratoconus

Authors

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Topic

Anterior eye and contact lenses

Abstract

This study was conducted to evaluate five-year outcomes of MyoRing implantation in patients with keratoconus. The results showed that MyoRing implantation is a minimally invasive procedure and is safe and effective for improving visual acuity and refraction in most patients with keratoconus.

Background

The long-term effects of MyoRing implantation on corneal features were studied.

Methods

A total of 48 keratoconic eyes of 43 consecutive patients who had undergone MyoRing implantation using the Pocket Maker microkeratome (Dioptex, gmbh, Linz, Austria) and who had completed five years of follow-ups were included in this retrospective study. Uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), refraction and keratometry (K) readings were measured and assessed pre-operation, and five years post-operatively. As well, post-operation satisfaction was assessed using a validated questionnaire.

Results

Five years post-operatively, there was a significant improvement in UDVA, CDVA, K readings, spherical equivalent (SE), and manifest sphere and cylinder ($p < 0.001$). Mean UDVA was 1.20 logMAR before the surgery and 0.42 after the surgery ($p < 0.001$). Mean CDVA was 0.63 logMAR before the surgery and 0.20 logMAR after the surgery ($p < 0.001$). SE was improved from -6.53 diopters (D) before the surgery to -2.23 D after the surgery ($p < 0.001$). Moreover, the results show that the mean K was reduced by 2.82 D after the surgery ($p = 0.001$). Overall, 81% of patients were moderately to highly satisfied five years after surgery.

Conclusion

MyoRing implantation was found to be a minimally invasive procedure, and is safe and effective for improving visual acuity and refraction in most patients with keratoconus.

Rapid Fire Presentation #4 (RF4)

Long-term impact of daily disposable hydrogel soft contact lens wear on corneal endothelium in children

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Topic

Anterior eye and contact lenses

Abstract

Purpose

Evidence shows that dual focus daily disposable soft contact lenses (SCL) can slow myopia progression. As children typically wear these lenses from a young age, their impact on anterior ocular health needs to be considered. This study investigated the long-term impact of hydrogel SCL on corneal endothelium and morphology in children.

Methods

Twenty participants (mean age: 20.6) who started wearing daily disposable hydrogel SCL (omafilcon A) for myopia correction or treatment at age 8-12 years were recruited. Participants successfully wore the SCL for 10 years, at least 10 hours per day and 6-7 days per week without any adverse events. Twenty age-matched controls (mean age: 20.8) without contact lens wear experience were recruited. The central corneal endothelium was photographed from each eye with a non-contact specular biomicroscope. A minimum of 100 contiguous cells, marked manually on each image using the centre-dot method, was analysed with the built-in computer algorithms. Endothelial cell density (ECD), average cell area (ACA), cell area variation coefficient (CV), hexagonal cell percentage (HEX), and central corneal thickness (CCT) were obtained.

Results

Intra-class correlation indicated strong correlation between the two eyes ($ICC \geq 0.9$). No significant difference was found between the groups in average ECD (control vs SCL: 3125 ± 197 vs 3092 ± 227 cells/mm², $p > 0.05$), ACA (320 ± 22 vs 325 ± 25 μm², $p > 0.05$), HEX (68 ± 5 vs 66 ± 7 %) and CCT (555 ± 22 vs 552 ± 28 μm, $p > 0.05$). Although 7 of 20 SCL participants had an average CV above 30, there was no statistically significant difference between the groups ($p = 0.08$).

Conclusions

The study showed wearing daily disposable hydrogel SCL full-time over 10 years caused no significant long-term impact on central corneal endothelium in children from 8 years, who had good contact lens habits and regular aftercare.

Rapid Fire Presentation #5 (RF5)

Condition of monthly replacement lenses following a four-week wear period using multipurpose and hydrogen peroxide solutions

Authors

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Topic

Anterior eye and contact lenses

Abstract

Purpose

Ocular discomfort can be an important reason for contact lens dropout. This study explores whether contact lens solution influences contact lens and case condition following wear.

Method

Contact lens wearers participated in a prospective, single-masked, randomised trial of three lens care products (ClearCare hydrogen peroxide, Alcon; MeniSept hydrogen peroxide, Menicon; Opti-Free PureMoist multipurpose, Alcon). Unlabelled bottles were provided with their corresponding cases and anonymised manufacturer's instructions. Participants wore new monthly-disposable Asmofilcon A lenses (Miru 1month; Menicon) with each solution. After a four-week wear period, participants completed a CLDEQ-8 questionnaire and supplementary survey on comfort with 0-10 Likert scales. Lenses were examined ex-vivo with stereomicroscopy and graded between 1 (none) and 4 (severe) for both damage and deposition (averaged for inner and outer surfaces). Lens cases were stained with crystal violet to quantify biofilm growth. Friedman tests, with Bonferroni-corrected post-hoc analyses, were performed in SPSS.

Results

Thirty participants completed the study (mean age 25.6±8.0 years; 73.3% female). Nineteen lenses (21%) were clinically significantly damaged, with no statistical difference between solutions ($P=0.33$). There was no statistically significant difference in mean deposition between solutions (Menisept 1.3 [1.0, 1.5], ClearCare 1.5 [1.0, 1.6], Opti-Free 1.5 [1.0, 2.0], $P=0.52$). Sixty-three lens cases (72%) demonstrated some form of biofilm growth. Median [IQR] biofilm biomass was similar between case types (MeniSept 0.14 [0.04, 0.20], ClearCare 0.12 [0.0, 0.31], Opti-Free 0.07 [0.0, 0.30], $P=0.79$). Measures of lens condition against comfort and CLDEQ-8 scores showed no observable trend.

Conclusion

One in five lenses showed clinically actionable damage following the manufacturers' expected wear period, which was higher than expected. Although hydrogen peroxide solutions are typically considered to offer a greater level of hygiene, this was not observed for either the lens case biofilm growth or lens deposition. Interestingly, no trend was observed between lens condition and subjective comfort scores.

Rapid Fire Presentation #6 (RF6)

Association between soft contact lens decentration and scleral shape

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Topic

Anterior eye and contact lenses

Abstract

Purpose

The aim of this study was to assess the association between decentration of soft contact lenses and the scleral shape.

Methods

This study included 24 right eyes of habitual spherical disposable and frequent replacement soft contact lenses wearers. In every eye HVID and anterior segment sagittal heights, for a chord of 15,00 mm, were measured using a Fourier transform profilometer and the lowest and highest sagittal heights with their relative direction determinate. After a minimum of 30 minutes from the habitual CLs fitting for lens settling the images of anterior eye were acquired in primary gaze and opening the eyelids to avoid their effect on the lens, with the slit lamp focused on the edge of the lenses. The position of the center of lens in respect to the center of the cornea was objectively determined using an images analysis software. Total decentration and its direction was determined also through trigonometric analysis.

Results

On average, most of CLs evaluated were displaced in a temporal–inferior position in respect to the center of the cornea regardless of the kind of lens used (temporal decentration 0.42 ± 0.36 mm, inferior decentration 0.36 ± 0.31 mm). A significantly strong Pearson's correlation was found comparing the differences between the lowest and highest anterior segment sagittal heights with the total decentration $r=0,812$ ($p<0,01$) and comparing the ratio between the total diameter of CL used and the HVID with the total decentration $r=0,858$ ($p<0,01$). A moderate Pearson's correlation was found instead comparing the direction of highest anterior segment sagittal height with the direction of the total decentration $r=0,589$ ($p<0,05$).

Conclusion

In conclusion the decentration of common disposable and frequent replacement soft CLs can primarily be attributed to the asymmetry of anterior segment. A lower difference between the total diameter of CLs and the HVID can reduce this effect.

Rapid Fire Presentation #7 (RF7)

Keratoconus and CXL treatment - When to prescribe post-operatively?

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Topic

Anterior eye and contact lenses

Abstract

Purpose

To analyze the “long term” effects of cross-linking treatment (CXL) on eyes with keratoconus* to help professionals evaluate when is the right time to prescribe correction. * (BCVA, refractive changes, correctability)

Methods

55 patients (90 cases) with keratoconus were followed pre- and post CXL treatment. The patients were examined before the surgery, and were controlled at 1,3,6,12 months postoperatively. We statistically analyzed the collected data and made a comparison between the pre-op. and post-op. keratometry values (K1, K2, CCT), corneal astigmatism and refraction changes at 12 months post CXL treatment. The correlation between corneal astigmatism and BCVA was examined.

Results

The mean keratometry values decreased during the 1-year observation period (preop. avg.: $46,22 \pm 3,19D$ and postop. avg.: $45,50 \pm 3,03D$). The corneal astigmatism showed large differences during the first three months, progressively stabilizing by month 12. The BCVA has significantly decreased between the 1st and 3rd month and by the end of the 1-year period, it returned to the level of preoperative vision (in 60% of the patients in the 6th month, in 90% in the 12th month) or has even surpassed it (in 50% of the cases). Significant correlation was not found between corneal astigmatism and BCVA. ($p_{12m}=0,370$ and $p \leq 0,05$)

Conclusion

Since significant changes may occur in visual acuity in the first 6 months after the surgical procedure, therefore optical correction of the patient can only be safely recommended 6 months after the operation. Despite the fact that during the first three months the refraction and best corrected visual acuity (BCVA) show fluctuations, this variability significantly decreases after the 6th month. In the post-operative 1st month and 3rd month, a significant deterioration in BCVA values can be measured ($p_{1m}=0,026$; $p_{3m}=0,044$ and $p \leq 0,05$).

Rapid Fire Presentation #8 (RF8)

What is the impact of small group teaching using case-based learning (CBL) on Optometry students' knowledge of binocular vision?

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Topic

Education and pathology

Abstract

Purpose

Case-based learning (CBL) is widely used in medical education. However, no studies have specifically focused on CBL in optometry. This study investigated the effects of CBL on final-year optometry students' knowledge of the assessment, diagnosis and management of accommodation and convergence anomalies, at The University of Manchester.

Methods

85 final year optometry students were randomly divided into two groups (intervention and control) prior to attending a binocular vision tutorial. Group 1 answered 8 MCQs (set A) before the small group teaching session and 8 MCQs (set B) immediately afterwards. Group 2 answered all 16 MCQs (sets A & B) before the teaching commenced. Comparisons were made between the MCQ results of sets A & B for the control and intervention group.

Results

There was no significant difference between the set A scores of Groups 1 and 2 (Group 1: median = 40, IQR = 30 [30-60]; Group 2: median = 40, IQR = 40 [20-60], Mann-Whitney U, $p = 0.25$). The Set B scores in Group 1 were significantly higher than those in Group 2 (Group 1: median = 60, IQR = 20 [50-70], Group 2: median = 50, IQR = 20 [40-60], Mann-Whitney U, $p = 0.02$).

Conclusion

CBL enhances optometry students' knowledge of the assessment, diagnosis and management of accommodation and convergence anomalies.

Rapid Fire Presentation #9 (RF9)

The impact of active learning in optometric education

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Topic

Education and pathology

Abstract

Purpose

This study investigates the impact of active learning on optometric education, focusing on how third- and fourth-year students perceive its effects on engagement, comprehension, and learning outcomes. Active learning strategies are increasingly integrated into health education programs to promote critical thinking and practical application of knowledge.

Content

The research employed a qualitative approach, using semi-structured interviews with eight optometry students who had completed either three or four years of study. The interviews explored the students' experiences with different teaching methods, particularly focusing on active learning techniques such as case-based learning, peer discussions, and hands-on activities compared to traditional lectures. The study aimed to understand which methods students found most effective in terms of knowledge retention and engagement. Data was analyzed through thematic analysis, identifying recurring themes and insights, using both an Excel chart to organize responses and a color-coded system to highlight key quotes.

Results

Students expressed a preference for a blended approach, combining traditional lectures with active learning methods. They found active learning, especially in small group discussions and problem-solving activities, to be more engaging and beneficial in applying theoretical knowledge to clinical practice. However, challenges were noted in managing time effectively during active learning sessions, and students expressed a desire for clearer instructions and more structured activities to optimize learning.

Recommendations/Conclusions

The study recommends a balanced integration of active learning techniques in optometric education. Faculty should receive additional training to deliver structured and guided active learning experiences, ensuring that students can maximize the benefits of these approaches. Further research could explore how active learning influences long-term knowledge retention and clinical performance in optometry.

Rapid Fire Presentation #10 (RF10)

What peer reviewed evidence underpins teaching, learning and assessment in optometric education?

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Topic

Education and pathology

Abstract

Purpose

This scoping review mapped the nature and extent of the existing evidence that underpins teaching, learning, and assessment in optometric education. The JBI Population, Concept and Context framework was followed to build clear inclusion criteria. It adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guidelines.

Content

In this study participants were opticians/optometrists either pre/post qualification. The concept was interventions related to teaching, learning, or assessment in optometric education with outcome measures including quantitative, qualitative, self-assessed, and supervisor assessed. The context was any environment where optometric teaching, learning or assessment takes place. A three-step search strategy was executed to identify relevant papers, the initial search took place on 17th October 2023 and was rerun on 30th August 2024. Articles were included if they were published in a journal available on any of the major indexed search sites and included: (a) a description of a teaching, learning or assessment strategy in optometric education and had a primary outcome measure reported. (b) the ability to separate the results from optometrists/optometry students from the rest of the paper.

Results

The search identified 100 papers from 20 countries, published in 35 journals. The following themes were identified. 1. Development of Clinical Skills & Competence 2. Evaluation of Teaching Methods 3. Professional Development and Continuing Education 4. Interdisciplinary and Collaborative Learning 5. Competency Frameworks 6. Technology in Education 7. Student Perceptions and Experiences. CEO has published the most papers (n = 21) followed by OPO (n =13) and OVS (n=11). Thirteen authors have published more than four papers. Fourteen different types of evidence have used to evaluate the effectiveness of optometric education.

Recommendations

Optometric educators should use evidence-based practice to underpin their pedagogic activities.

Rapid Fire Presentation #11 (RF11)

“LEERafdeling – The Learning Department” – new concepts in multidisciplinary optometric and ophthalmological education

Authors

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Topic

Education and pathology

Abstract

Background

Due to the demographic developments the demand of eye care services is growing. At the same time the available working force is declining. Therefore, task reallocation is between the different eye care providers is needed. The educational programs need to provide training programs to prepare future optometrist and other health care providers for their new role and responsibilities.

Content

The presentation will provide insights on the newly developed “LEERafdeling – The Learning Department”, a joined project of the Optometry Department at the University of Applied Sciences in Utrecht and the Ophthalmology Department at the University Medical Center Utrecht, The Netherlands. It is the first joined learning department where allied health professionals and ophthalmology residents are trained and working together.

Results

The presentation will present the journey towards this newly developed educational innovation, provide advice on how to approach this type of projects, and discuss first experiences since implementation. Barriers and facilitators will be discussed.

Recommendations/conclusions

Multidisciplinary education and task reallocation are needed in times of workforce shortage and an aging society. Optometric educational programs need to find new ways to prepare optometric students for their future working field. The innovative multidisciplinary “LEERafdeling – The Learning Department” may provide part of the solution for more joined educational programs in eye care.

Rapid Fire Presentation #12 (RF12)

Selective blue-violet light filtering lenses protect retinal cell aging under sunlight-induced cell damage

Authors

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Topic

Education and pathology

Abstract

Blue light from sun is an accelerating factor for retinal ageing. This study investigated whether filtering 400-455nm wavelengths from simulated retinal solar exposure can protect retinal pigment epithelium (RPE) cells.

Primary porcine RPE cells loaded with 20 μ M A2E exposed to emulated broadband sunlight filtered through eye media at 1.8 mW/cm² for 18 hours. Five filters with variable aesthetics and attenuation patterns of 400-455nm were introduced in the light path, from 25% to 80%. Cell damage was measured by apoptosis, hydrogen peroxide (H₂O₂) production, and mitochondrial membrane potential (MMP). For each biomarker and each filter, 12 cell-plate wells were averaged, and the experiment repeated at least 4 times. Data were normalized to dark. ANOVA with repeated measures and Dunnett tests were used to compare the variance of all light-exposed groups with filters to the no filter condition.

Emulated retinal sunlight exposure increased apoptosis by 2.7-fold, H₂O₂ production by 4.8-fold, and reduced MMP by 50% compared to cells kept in darkness. Eye Protect System™, filtering out 25% of the 400-455 nm range, reduced apoptosis by 44% (p<0.01) and H₂O₂ by 29% (p<0.05). The highest blue-violet filtering lens (80%) reduced apoptosis by 91% (p<0.001), lowered H₂O₂ by 69% (p<0.001), and increased MMP by 73% (p<0.001). It outperformed a dark yellow IOL-mimicking filter attenuating light within broader 400-500 nm range. Photoprotection linearly correlated with the degree of attenuation over 400-455 nm (R²=0.998 for H₂O₂), but not with broader blue light attenuation over 400-500 nm, demonstrating the greater efficacy of filtering the blue-violet range for preserving RPE cells.

Selective filters blocking 25% to 80% of 400-455 nm significantly mitigate sunlight-induced retinal damage in vitro, while being more aesthetic than broadband filtering. Photoprotection linearly correlates with blue-violet light filtering, making those selective filters promising as a preventative measure against light-induced retinal ageing.

Rapid Fire Presentation #13 (RF13)

Visual electrophysiology as a key tool in Ophthalmology

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Topic

Education and pathology

Abstract

Purpose

The lecture is intended to serve as an introduction and/or deep review to the fundamentals of visual electrophysiology and its key role and applications in various retinal, optic nerve and visual pathway disorders.

Content

The course will cover visual electrophysiology technology basic concepts, cellular correlation and clinical applications. All visual electrodiagnostic modalities (ffERG, VEP, EOG, mfERG and PERG) will be reviewed followed by case presentations and discussion. Emphasis will be placed on correctly interpreting and indicating the different studies, clarify how the use of various procedures can be of important value in the diagnosis and monitoring of patients with hereditary or acquired disorders. Electrophysiology plays an important role in inherited retinal diseases and helps to guide or narrow the genetic testing that best fit the patients' tentative diagnosis as well as essential information about their disease, possible future treatments and impact their families. Lastly, electrophysiology holds a privileged place in the pediatric population.

Conclusion

Electrophysiology is an important objective tool in many eye diseases to differentiate optic nerve vs macular dysfunction where symptoms and signs can be poor indicators of the severity and nature of the disease, monitor efficacy of treatment as well as management decisions can be taken with increased confidence. The new and sophisticated techniques and advanced devices make this sometimes forgotten and feared discipline much more accessible and friendly.

Rapid Fire Presentation #14 (RF14)

Personalisation: Why it matters with progressive addition lenses?

Authors

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Topic

Optics

Abstract

Content

With increasing longevity, most of the population in developed countries will spend roughly half of their lives as presbyopes. Currently, almost two billion people are presbyopic globally. The most common method of ameliorating the symptoms of presbyopia is with the use of spectacle lenses, either single vision, bifocal/ trifocal or progressive addition lenses as well as contact lenses. Near vision requirements have changed dramatically over the last two decades, and today's wearers are now continuously challenged to switch their gaze back and forth between various tasks and from one object to another. Progressive addition lenses enable presbyopes to focus instantly and optimally at any distance, in any direction. Manufacturers have continued to adapt the technology of progressive addition lens (PAL) designs to meet the modern visual needs and lifestyles to enhance vision and comfort. With digital surfacing techniques, the optical performance can be matched exactly to every patient's individual visual requirement, by considering several individual parameters, including pantoscopic tilt, vertex distance and wrap angle. A personalised PAL is one that considers parameters that are not used in the design of standard progressive lenses.

Results

This presentation will highlight the key parameters which influence progressive lens performance and how the quality of measured individual parameters, such as eye dominance, near vision behaviour, back vertex distance impact the optical performance of progressive addition lenses.

Conclusion

Following this lecture, attendees will gain valuable insights into how visual performance of a PAL is strongly linked to how a lens is positioned in front of the eyes, frame parameters and how eye care professionals can utilise their clinical skills and expertise to ensure each lens is catered to the specific requirements of the patient to provide the best visual solution to their patients.

Rapid Fire Presentation #15 (RF15)

Factors influencing the return of eyeglasses to optical store

Authors

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Topic

Optics

Abstract

Purpose

The literature identifies several common reasons for eyeglass returns, including inaccurate refraction determination, improper lens parameter specifications, adaptation difficulties, ocular or systemic pathologies, ordering errors, and communication issues. A systematic review of five studies revealed that poor communication accounted for 16.3% of all return cases. However, existing research is limited and does not adequately reflect recent trends in the past decade regarding the reasons for returning optical lenses. This study aims to evaluate the reasons for eyeglass returns in Latvia and determine whether significant differences exist in the return rates of lenses based on their design types.

Methods

Data were collected from the largest optical retail chain in the Baltic region, encompassing a total of 98,016 lenses (78,939 monofocal spherical; 6,534 monofocal aspheric; 9,689 progressive; 2,401 antifatigue; 453 office-type). The Chi-square test (significance level 5%) was used to evaluate statistical differences in return rates across lens types.

Results

The most common reason for eyeglass returns was prescription intolerance (63.7%), followed by incorrect prescriptions (12.1%). Statistically significant differences in return rates were observed across lens design types ($p < 0.01$). Monofocal spherical lenses were returned in 0.6% of cases, monofocal aspheric in 2.9%, progressive in 2.5%, antifatigue in 2.6%, and office lenses in 5.3%. The highest return rates were noted among patients with high-grade ametropia (hypermetropia 1.5%; myopia 2.1%), with an overall higher return rate for myopia cases compared to hyperopia ($p < 0.01$). Additionally, statistically significant differences in return frequencies were observed among different categories of add power ($p < 0.01$). Lenses with ADD ≥ 2.00 D had a return rate of 59.0%, compared to only 2.0% for lenses with ADD ≤ 1.00 D. Differences in return rates among multifocal lenses from various manufacturers (Pentax, Essilor, LTL, Seiko) were not statistically significant ($p > 0.06$).

Conclusions

Office lenses are the most commonly returned type of optical lenses. Lenses with higher dioptres (myopia, hyperopia III) and additions (ADD ≥ 2.00 D) were returned more frequently. Spherical myopia correction lenses exhibited higher return rates than spherical hyperopia correction lenses. Patients most commonly return their glasses due to difficulty adapting to the new optical correction.

Rapid Fire Presentation #16 (RF16)

Correcting near vision impairment and women's empowerment: A before–after mixed–methods study among older Zanzibari craftswomen

Authors

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Topic

Optometric care

Abstract

Purpose

This study aimed to investigate whether providing presbyopic spectacle correction could empower older craftswomen entrepreneurs living in Zanzibar.

Methods

This mixed-method, before-and-after intervention study was conducted on Unguja and Pemba islands in Zanzibar. A total of 209 craftswomen aged 40 years and older, with correctable presbyopia and no other ocular morbidities, underwent eye health assessments. Before dispensing near-vision spectacles, a baseline women's empowerment questionnaire was administered and repeated six months after correction. Five focus group interviews were conducted to explore the craftswomen's daily experiences regarding vision correction and empowerment, with subsequent narrative analysis. Primary and secondary outcomes included changes in economic, social, psychological, and political empowerment (measured using a four-point Likert scale) pre- and post-correction. Odds ratios were calculated to assess the likelihood of upward movement on the Likert scale.

Results

Of the 209 craftswomen who completed the baseline survey (April 4–21, 2022), 157 (75.1%) successfully completed the follow-up survey (October 6–27, 2022). Significant improvements in economic, social, psychological, and political empowerment were reported in 14 of 18 (77.8%) statements ($p < 0.05$). Highlights included increases in women reporting the ability to decide how to run their business (OR 1.66; 95% CI 1.04–2.64, $p < 0.001$), feeling equal to peers (OR 2.24; 95% CI 1.38–3.63, $p < 0.001$), being at peace with themselves (OR 2.68; 95% CI 1.63–4.39, $p < 0.001$), and advising their community on various issues (OR 2.24; 95% CI 1.43–3.51, $p = 0.016$).

Qualitative findings revealed that post-correction, craftswomen experienced increased autonomy in business operations, improved income, better decision-making power for their businesses and children, enhanced independence and confidence, and greater participation in community problem-solving and leadership selection. However, no significant changes were observed in the ability to make family decisions, understand personal capabilities, be elected as a leader, or advise government officials.

Conclusions

Presbyopia correction is positively correlated with empowerment among older Zanzibari craftswomen, particularly in economic, social, and psychological domains. However, further investigation is needed to understand aspects of empowerment that showed limited or no improvement, potentially requiring an extended intervention timeframe or additional support mechanisms.

Rapid Fire Presentation #17 (RF17)

Novel affordable mobile spectacle kit as a new solution for refractive error in low- to middle-income countries

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Topic

Optometric care

Abstract

Purpose

Refractive errors, including myopia, hyperopia, and astigmatism, are major causes of visual impairment in low- to middle-income countries (LMICs), where access to eye care is limited. This trial addresses the urgent need for cost-effective solutions to improve quality of life, education, and economic productivity by expanding access to corrective eyewear.

Content

The novel affordable spectacles aim to revolutionize refractive error correction in rural LMICs. The pilot study explores the feasibility of a mobile kit featuring generic frames with interchangeable prescription lenses, enabling glasses to be made within 10 minutes of diagnosing refractive error. This allows immediate dispensing of glasses anywhere. With annual global productivity losses of \$202 billion due to uncorrected refractive errors, this initiative aims to support LMICs by providing affordable spectacles and training local providers.

Methods

Fifty participants are being recruited at CitySight Eye Clinic at City St George's, University of London. In order to qualify for inclusion in the study, participants must (i) show evidence of a recent eye test (within two years) and provide a spectacle prescription, (ii) obtain an appropriate level of visual acuity/visual field when wearing the appliance, (iii) wear a specially made pair of glasses tailored to their prescription when completing certain daily tasks and (iv) complete a Qualtrics NEI RQL-42 standardised questionnaire on how well they were able to complete these daily tasks when wearing the low cost spectacle initiative after 14 days of use.

Results

Results presented will include user acceptability of the spectacles and their impact on visual function, as assessed by the NEI RQL-42 questionnaire.

Actions Taken

Feasibility and acceptability are being evaluated. Providers' feedback on ease of use and users' satisfaction with the spectacles are key metrics. Daily experience, vision-related quality of life, and overall satisfaction will be assessed.

Recommendations

The trial is expected to demonstrate a sustainable, scalable model for LMICs, supporting WHO's 2030 targets. This initiative highlights the potential of accessible, low-cost solutions to reduce uncorrected refractive errors and improve socio-economic outcomes globally.

Rapid Fire Presentation #18 (RF18)

An investigation of the lived experience of children with vision impairment due to uncorrected refractive error and the impact of spectacle correction on their well being

Authors

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Topic

Optometric care

Abstract

Background

Uncorrected refractive error (URE) is the leading cause of vision impairment in children worldwide, significantly impacting their educational, social, and developmental experiences. While spectacles can address these impairments, evidence on their effectiveness in improving children's overall well-being, especially in diverse socio-economic settings, remains inconsistent. This qualitative study examined the lived experiences of children with URE and the impact of spectacle correction on their well-being in rural South Africa.

Methods: Children with visual acuity below 6/12, improving by two or more lines with corrective lenses, meeting specific refractive error criteria (myopia $\leq -0.75D$, hyperopia $\geq +2.00D$, astigmatism $\geq 1.00D$), were purposively sampled. From 29 eligible children, 12 participated in in-depth interviews three months post-correction. To supplement insights, 10 teachers and 3 parents provided proxy reports. Data analysis employed a systematic thematic approach: meaning units were identified, summarized, and grouped into themes and subthemes across categories like functional challenges, academics, and peer interactions. Themes emerged inductively, providing a comprehensive understanding of children's well-being post-spectacle correction.

Results

Children with URE faced difficulties seeing the board, reading, and participating in sports, causing frustration, low self-esteem, and isolation ["I complained but teachers do nothing... I will just sit down and cry." (Case 8, F-11)]. After receiving spectacles, improvements were noted in academic performance, including spelling, handwriting, and classroom participation ["I was blind and could not write and read books without glasses." (Case 5, F-8)]. Teachers observed positive changes in children's self-confidence, social interactions, and independence ["His confidence has increased; he plays football now and interacts freely." (Case 11, T)]. However, some children continued to struggle due to residual vision issues, and families needed additional guidance on spectacle care. Limited family support, particularly in single-parent households, posed challenges to consistent spectacle use and emotional support, emphasizing the need for broader family education and engagement.

Conclusions

The study demonstrates that vision correction via spectacles significantly benefits children's academic, social, and emotional well-being, yet ongoing challenges highlight the need for comprehensive support. Educating families on spectacle care and fostering inclusive, culturally sensitive support is essential, as a collaborative approach can more effectively address the needs of visually impaired children.

Rapid Fire Presentation #19 (RF19)

Prevalence and causes of visual impairment in people attending NGO-run, outreach clinics in Zambia.

Author

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Topic

Optometric care

Abstract

Purpose

Visual impairment (VI) negatively impacts quality of life, education, and employability but is often treatable with appropriate management following eye examinations, however, access to even basic eyecare in Zambia is inadequate. Vision Action, a non-governmental organization, supports eye-care provision in Zambia, with the aim of reducing preventable vision loss. One way it does this is by organising outreach clinics, which are a way of addressing eyecare needs in hard-to-reach communities, and this study aimed to report on the prevalence of presenting VI and ocular pathology in people attending these services in Zambia.

Methods

A retrospective analysis of outreach records from 2012–2015 was performed. Data collected included patient demographics, presenting symptoms, presenting vision, and classification of any ocular pathology present. Levels of VI were categorized using the World Health Organisation classification of blindness and VI.

Results

Data from 5809 patient episodes were collected (58.5% female, mean age = 41.9 years, SD =20.7). Presenting vision, in the better eye, was classified as moderate VI in 14.6% (n=824), severely VI in 0.3% (n=16) and blind in 4.6% (n=260) of individuals. Uncorrected refractive error was responsible for 57.7% and 41.0% of blindness and moderate VI respectively. Cataract, corneal scarring, and glaucoma were the most prevalent non-refractive ocular pathologies, associated with VI.

Conclusions

The high prevalence of presenting blindness and VI is of importance, in this largely working-age population, and the most common cause is uncorrected refractive error. Outreach clinics are an effective way of detecting and treating uncorrected refractive error. This indicates an urgent need to provide and develop primary eyecare services within Zambia to improve ocular health, reduce VI and improve quality of life.

Rapid Fire Presentation #20 (RF20)

Patient-centred care begins with a regional community of professionals

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Topic

Optometric Care

Abstract

Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by both motor and non-motor symptoms, including cognitive impairment and visual disturbances. Effective management of PD requires a multidisciplinary approach, involving various healthcare professionals who interact with patients regularly. Eyecare in general and specific optometrists, are not involved in the multidisciplinary network of professionals specialized in Parkinson's disease, such as nurses, occupational therapist, physiotherapy in the Netherlands.

Objective

This study aims to explore the knowledge of Parkinson disease and dry eye by optometrists. As well the knowledge of eye care and dry eye particular by district nurses, specialized nurses in Parkinson's disease and occupational therapists and carers. Second aim is to investigate the need of a multidisciplinary care community specific for eyecare related topics.

Methods

A mixed-methods approach was employed. Initially, a nominal group technique (NGT) was used, involving problem identification, solution generation, and decision-making. In the second round, an online session was held to discuss the outcome and further steps needed. Except for the optometrists all the other stakeholders were recruited at two Parkinson café's (meeting centres) in the south-west part of the Netherlands. The optometrists were recruited by responding by invitation to participate via linked in and direct mailing. The eye society was asked to be involved. Thematic analysis was used to identify key themes and patterns, focusing on facilitators and barriers.

Results

In total 11 professionals, four optometrists, one district nurse, two specialized nurses for Parkinson, two carers (assistant ophthalmology and general nurse), one occupational therapist and one representative of the eye society, were involved. In general, there was a lack of awareness and knowledge among the healthcare professionals and optometrists about dry eye and visual disturbance in Parkinson's disease. They expressed the need for multidisciplinary eyecare education and a communication platform to be able to provide better care.

Conclusions

The study underscores the necessity for enhanced eyecare education and training for healthcare professionals. By incorporating the carers and patient perspectives, the findings advocate for a more integrated and patient-centred approach to eyecare, improving multidisciplinary communication, especially on a local level.

Rapid Fire Presentation #21 (RF21)

More technology, more innovation, less time = Optometrist burnout

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Topic

Optometric care

Abstract

Background

According to study papers from the UK, USA and Australia that there is approx. 30% of optometrists in each country who are suffering from Burnout

Methods

This presentation will look at the different aspects of burnout, its classification and the mental health impact it has on practitioners. Going through recognising the overt signs of burnout. What burnout in optometric practice looks like. How to avoid burnout with 5 simple strategies. How an optometrist can recover from burnout by identifying what are the pinch points causing the burnout and reframing their career goals and objectives.

Results / conclusion

Using well known mental health coping strategies to come out of the burnout a better person.

Rapid Fire Presentation #22 (RF22)

The dynamic optotype (Dyop): A novel visual acuity test for use in children

Authors

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Topic

Paediatrics

Abstract

Purpose:

To evaluate the “dynamic optotype” (Dyop), a simple visual acuity test based on a dynamic target that requires minimal knowledge of symbols and letters.

Methods

A total of 160 consecutive, systemically healthy children, 4-17 years of age were prospectively recruited from the Pediatric Ophthalmology Unit of Meir Medical Center. Children were tested with the Dyop visual acuity test and the Early Treatment Diabetic Retinopathy Study (ETDRS) Lea numbers chart. The results of both tests were compared. The eye with the poorest acuity was tested with the new Dyop eye chart and the Lea numbers chart. The order of the testing was reversed between children. The logMAR visual acuity scores for each eye chart were compared.

Results:

We found a strong linear correlation ($r = 0.88$) between visual acuity measures. The mean difference in visual acuity was -0.01 (95% CI, -0.02 to 0.01). The 95% limits of agreement were ± 1.2 lines. The logMAR equivalent mean difference was about less than 1 letter. The Dyop test underestimated visual acuity relative to the Lea numbers chart.

Conclusions

The results of this study support the Dyop eye chart as a valid measure of visual acuity in children 4-17 years of age, with visual acuity ranging from 20/16 to 20/200.

Rapid Fire Presentation #23 (RF23)

Interocular asymmetries in axial length and refractive error in schoolchildren in Ireland

Authors

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Topic

Paediatrics

Abstract

Purpose

An individual child's right and left eyes share genes and environment. In binocular perceptual tasks, the dominant eye prioritises visual processing due to its higher influence on inhibitory connections between eyes. This study examined the effect of dominance and laterality on spherical equivalent refraction (SER) and axial length (AL) in Irish schoolchildren.

Methods

Participants were 1,626 schoolchildren (54% male), 728 aged 6–7, and 898 aged 12–13. Each participant underwent measurements of cycloplegic autorefractometry and axial length (IOL Master). Ocular dominance was determined using the hole-in-card Dolman test. The paired t-test compared differences in refraction and AL between right and left eyes and between dominant and non-dominant eyes.

Results

No significant difference in SER or AL between right and left eyes in either age group ($p > 0.05$ for all). Among 6–7-year-olds, 68.4% exhibited right-eye dominance and 31.6% left-eye dominance. For 12–13-year-olds, 65.4% and 34.6%. Dominant eyes were less hyperopic than non-dominant eyes (6–7yrs: $1.35 \pm 1.20D$ versus $1.45 \pm 1.33D$, $t = -4.22$, $p < 0.001$, 12–13yrs: $0.28 \pm 1.54D$ versus $0.38 \pm 1.78D$, $t = -3.51$, $p < 0.001$). Likewise, dominant eyes AL were longer than non-dominant eyes (6–7yrs: 22.56 ± 0.78 mm versus 22.50 ± 0.83 mm, $p = 0.01$, 12–13yrs: 23.52 ± 0.88 mm versus 23.46 ± 0.92 , $p < 0.001$). The dominant eye demonstrated a more myopic SER in 63.9% of 6–7-year-olds ($p < 0.001$) and 62.9% of 12–13-year-olds ($p < 0.001$). The dominant eye exhibited a longer AL than the non-dominant eye in 57.7% of 6–7-year-olds ($p = 0.002$) and 58.7% of 12–13-year-olds ($p < 0.001$). These findings persisted in emmetropes and hyperopes; however, in myopic (SER $\leq -0.50D$) 12–13-year-olds, The non-dominant eye was less myopic (dominant -1.79 (0.12) D vs non-dominant -1.96 (0.11) D, $p = 0.02$).

Conclusions

This study suggests that ocular dominance may be valuable in assessing refractive error development and myopia progression, with potential implications for personalised, innovative eye care over a lifetime. Recognising ocular dominance and its impact on refractive development could guide myopia control strategies in clinical trials and enhance lifelong myopia management.

Rapid Fire Presentation #24 (RF24)

Evaluating the novel visual acuity near distance facility test (VA-NDFT) in school aged children

Authors

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Topic

Paediatrics

Abstract

Purpose

Visual difficulties in transition from the classroom screen/board and near tasks and vice versa are common complaints among school age children, encountered frequently by the pediatric ophthalmologist. Our study evaluates the novel Visual Acuity Near Distance Facility Test (VA-NDFT) in school aged children.

Methods

We conducted a prospective study with 94 participants (mean age 12.8 ± 2.0 years; 55 females). Inclusion criteria were ages 10-17 years, best-corrected visual acuity $>20\backslash/30$ distance, and $>J1$ near either eye. Exclusion criteria included presence of other eye pathology or neurologic/cognitive conditions. The NDFT score was measured in cycles per minute, where one cycle consisted of correctly identifying 3 lines of 5 (20\40) digits at 3 meters and 3 lines of 5 (1M) digits at 40 cm.

Results

There was a significant positive correlation between age and NDFT score ($r = 0.58, p \leq 0.001$). The NDFT score showed a strong correlation with binocular reading speed (Spearman's $R = 0.74, p \leq 0.001$). This correlation was consistent in both strabismic ($R = 0.80, p \leq 0.001$) and non-strabismic subgroups ($R = 0.69, p \leq 0.001$). No correlation was found between NDFT scores and near point of convergence (NPC) or stereopsis. Additionally, there were no significant differences in NDFT scores based on the presence of refractive errors (myopia, hyperopia, astigmatism).

Conclusions

The NDFT is significantly correlated with binocular reading speed but does not correlate with refractive errors or binocular vision characteristics (strabismus, NPC, stereopsis). Additional research is required to investigate the implications of incorporating the novel NDFT into the pediatric ophthalmology examination.

Rapid Fire Presentation #25 (RF25)

Advancing pediatric vision care : Advancing Vision R™ – 800 technology for comprehensive eye health solutions in children

Authors

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Topic

Paediatrics

Abstract

Purpose

Children's vision care requires specialized solutions. This study proposes a subjective refraction method for children using both an algorithm-assisted software and the Vision-R™ 800, addressing refractive errors, and enhancing the patient experience with engaging visuals. The performance of the subjective refraction software optimized for children (SRI) in non-cycloplegic condition was compared to cycloplegic standard subjective refraction (SSR).

Methods

This single-centre study at PolyU involved 66 children aged 6–13 years (mean age: 9.6 ± 2.2 years). After informed consent they underwent baseline auto-refraction and preliminary assessments. Subjective refraction was first performed using a self-adapting algorithm with letter comparison and larger step sizes for cylinder differentiation (SRI), and optimized for children through adapted instructions and targets with dedicated thresholds for expected visual acuity and accommodation control. A second auto-refraction (Wet AR) and standard subjective refraction (SSR) were conducted using the Vision-R™ 800 under cycloplegia.

During the exams, 2D images and 3D stereoscopic stimuli were presented following the subjective refraction exam to assess children's reactions. At the end of the visit, participants rated their refraction experience using a five-point emoji scale, ranging from 'awful' to 'fantastic.'

Results

The Bland-Altman analysis between SRI and SSR showed 95% limits of agreement (LoA) within ± 0.50 D for sphere, ± 0.35 D for J0, and ± 0.30 D for J45. The mean spherical equivalent (M) from SRI was -1.14 ± 1.49 D, while SSR yielded -0.93 ± 1.52 D, with SRI being -0.22 D more negative than SSR ($p < 0.01$). Subgroup analysis revealed that SRI produced significantly more negative M values in both the myopic (-0.19 D ± 0.26 D) and pre-myopic (-0.25 D ± 0.27 D) groups compared to SSR ($p < 0.01$). The SRI method in non-cycloplegic condition yield a refraction time of 5.70 minutes, compared to 4.77 minutes for SSR in cycloplegic condition ($p < 0.05$). In terms of patient experience, the SRI method was well-received, with 81.3% of children rating it "really good" or "fantastic".

Conclusion

This study demonstrates the effectiveness and the good acceptance of the SRI method coupled with Vision-R™ 800 phoropter providing accurate refraction results. Although SRI required more time for non-cycloplegic measurements, it was well-received by 81.3% of the children. These findings support SRI as a reliable and patient-friendly option for pediatric refraction, with minor differences to be considered in real practice.

Disclosure

The studies have been funded by EssilorLuxottica (France). Author affiliations are disclosed.

Rapid Fire Presentation #26 (RF26)

Visual function screening in school-age children

Authors

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Topic

Paediatrics

Abstract

Topic

Vision screening of school-age children, its development and application options.

Content

Recent studies have demonstrated that visual function examination is essential in school-age children and that unsolved vision problems can be linked to potential learning difficulties. The simplest method for a quick assessment of the discrepancy in visual function is vision screening. However, the wide variety of visual function problems makes it difficult to design a screening program based on a single test.

Results

In 2010–2013, two screening algorithms (manual and computerized sets of screening tests) were developed (sensitivity: 87% and 82%; specificity: 77% and 71%). The results of screening in 30 Latvian schools (11,033 participants, ages 6–19 years) demonstrated that school-aged children present with a wide range of near vision problems, while in most cases children had no vision-related complaints. About 1/3 dropped out directly due to possible accommodative and binocular disorders. The incidence of near vision problems was higher in children with learning difficulties. In 2022–2024, the ongoing study of comprehensive visual function examination ($n = 82$, age 6–12 years) demonstrated that children with reading difficulties ($n = 39$) were more likely to have uncorrected refractive errors and a wider range of accommodative and binocular disorders. The frequency of complaints was significantly lower than the observed visual problems.

Recommendations and conclusions

The results highlight the value of visual function screening in school-age children that is rapid, reasonably priced, and highly efficient without requiring costly technology or highly qualified specialists. We will discuss the most relevant and informative test set for vision screening in the presentation.

Rapid Fire Presentation #27 (RF27)

Strabismus without amblyopia in children: Does it affect binocular reading speed?

Authors

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Topic

Paediatrics

Abstract

Introduction

Limited research exists on reading speed in strabismus without amblyopia. Our study compares binocular reading speed in children with strabismus without amblyopia versus normal controls.

Methods

We conducted a prospective study with 81 participants: 35 childhood-onset strabismus without amblyopia and 46 controls. Mean ages were 12.6±1.9 for the strabismus group and 12.8±2.1 years for the control ($p=0.82$). Inclusion criteria were age 10-17 years, best-corrected visual acuity $>20\ \backslash/30$ distance, and $>J1$ near either eye. Exclusion criteria were presence of other eye pathology or neurologic/cognitive conditions. Reading speed was assessed using the International Reading Speed Texts, with each participant reading two passages (3 and 5). Speed was measured in words per minute (WPM).

Results

Age showed a significant correlation with WPM ($r=0.68$, $p<=0.001$). A strong correlation between WPM of passages 3 and 5 was found both in strabismic and control children ($r=0.99$, $r=0.98$ accordingly, $p<=0.001$). Mean binocular reading speed for passage 3 for strabismus group was 109.5 WPM and 104.7 WPM for the control ($p=0.61$). Mean binocular reading speed for passage 5 for strabismus group was 111.6 WPM and 108.5 WPM for the control ($p=0.88$). No correlation between binocular reading speed and stereopsis or near point of convergence was found in both groups.

Conclusions

Children with strabismus without amblyopia did not have a slower binocular reading speed compared with controls. Further studies with eye tracking may provide more information. Strabismus without amblyopia appears not to affect reading performance in children aged 10-17 years.

Rapid Fire Presentation #28 (RF28)

Prevalence of amblyogenic risk factors among children aged 3.5–5.5 years in Scotland who fail their vision screening: A retrospective epidemiological study

Authors

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Topic

Binocular vision

Abstract

Purpose

Scotland, population ~5.5 million, has a comprehensive vision screening programme by orthoptists for children aged 3.5–5.5 years. Tests include presenting vision, cover test, and orthoptic evaluations. Screening failures are referred for an optometrist's or, infrequently, ophthalmologist's eye examination, including cycloplegic refraction. Primary aim: report prevalence of amblyogenic risk factors (ARF) in children who failed screening and completed an eye exam. Secondary aim: assess any association between deprivation quintiles and screening failure.

Methods

ARF prevalences were calculated for the 2021\22 school year using data from Scottish Health Boards containing >85% of Scotland's population. ARF definitions, based on American Association for Pediatric Ophthalmology & Strabismus (AAPOS) criteria, were: constant manifest strabismus, hyperopia (spherical equivalent refraction, SER) >4.00D (one\both eyes), astigmatism >1.75DC (one/both eyes), anisometropia >1.25DC for astigmatism, and >1.25D (SER) for hyperopic or mixed (one eye hyperopic, one myopic) anisometropia.

Results

Of 39,741 children screened (77.20% of eligible), 8,317 (20.93%) failed and were referred for eye examinations, with data returned for 5,503. The difference between the proportion who failed screening for any reason in the most deprived quintile (28.15%) compared to the least deprived quintile (15.29%) was statistically significant ($p < 0.001$, 48.23% astigmatism >1.75D, 26.59% hyperopic anisometropia, 12.64% astigmatic anisometropia, 1.96% mixed anisometropia, and 13.73% constant manifest strabismus).

Conclusions

In this predominantly Caucasian population, 5.15% (95% CI: 4.92–5.38) of Scottish children (aged 3.5 – 5.5 years) have at least one ARF. The high prevalence of ARFs highlights the importance of a universal child vision screening programme. Children in the most deprived quintile are more likely to fail vision screening.

Rapid Fire Presentation #29 (RF29)

Innovative strategies for diagnosing and managing accommodative insufficiency and accommodative spasm

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Topic

Binocular vision

Abstract

Purpose

This presentation focuses on strategies for diagnosing and managing accommodative insufficiency (AI) and accommodative spasm (AS). AI is relatively common in school-aged children (11–33%). Kaphle (2020) reported that myopes have double the accommodative lag compared to emmetropes, whereas AS is rare and typically associated with specific triggers or secondary causes. These binocular vision anomalies significantly impact near-visual performance and quality of life.

Content

AI is characterised by reduced amplitude of accommodation (AA), which results in blurred near vision, headaches, and eye strain. Whereas, AS involves involuntary excessive accommodation, often presenting as pseudomyopia, convergence excess, and fluctuating vision. Key diagnostic tools include AA measurement (e.g., Donders' push-up method), dynamic retinoscopy (NOTT/MEM) to evaluate accommodative lag or lead, and accommodative facility testing with +2.00/-2.00 lenses. Cycloplegic refraction is essential for distinguishing AS from other refractive conditions. Management integrates low plus lenses (+0.75D to +1.50D) for AI and structured vision therapy exercises targeting AI and AS. Techniques such as modified optical fogging provide immediate symptom relief for AS while improving long-term outcomes.

Results

Abdi and Rydberg (2005) demonstrated that low-plus lenses reduce accommodative demand in AI, improving near-vision performance and alleviating symptoms in over 90% of the 121 cases. Vision therapy significantly enhances accommodative facility and flexibility, with marked improvements in subjective comfort and objective clinical measures (Manna et al. 2023). Modified optical fogging techniques have shown immediate efficacy for AS, while cycloplegic agents and tailored vision therapy offer lasting resolution (Roy et al., (2023). The integration of these approaches ensures a sustainable impact on visual performance.

Recommendations / Conclusions

Clinicians should adopt a comprehensive approach to identifying and managing AI and AS, incorporating multiple diagnostic tools and personalised treatment plans. Low-plus lenses and vision therapy represent cost-effective, impactful interventions. Emerging methods like optical fogging could be considered for immediate relief in AS cases. These strategies underscore the importance of innovative, patient-centered care in achieving lifelong visual health and quality of life.

Rapid Fire Presentation #30 (RF30)

Vision-related quality of life of myopic children combination treatment: Atropine and defocus incorporate multiple segments spectacle lens

Authors

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Topic

Myopia

Abstract

Aim

To assess vision-related quality of life in children undergoing myopia control treatment using atropine drops compared to children treated with combined treatment of atropine and Defocus incorporated multiple segments (DIMS) spectacle lenses.

Methods

This longitudinal study included myopic children aged 4 to 16 years undergoing myopia control treatment. Group A included children on 0.025% atropine eyedrops and single-vision lenses, and group B included children on combined treatment of 0.025% atropine and DIMS lenses. Demographic and clinical data, including cycloplegic spherical equivalent refraction (SER) and axial length (AL), were noted. VR-QoL was assessed using the Children's Visual Function questionnaire (CVFQ) and the Pediatric Eye Questionnaire (PedEyeQ) before initiating and after 6 months of treatment. Statistical analyses (Mann-Whitney U-test or t-test) were performed.

Results

95 patients were included: 50 children in group A, mean age 8.94 ±2.50 years and 45 children in group B, mean age 9.51 ±2.46 years (p=0.266). No significant differences were found in the overall VR-QoL between both groups with PedEyeQ. Functional Vision and Social item scores (PedEyeQ) significantly improved at the 6M follow-up in group A (p=0.03 and p=0.016, respectively) and group B (all p=0.01). Scores on the Eye Condition item (PedEyeQ) at baseline and at 6M follow-up were reversed; a decrease in group A, 89.73 [69.86-89.73] and 64.98 [50.02-74.99] (p<= 0.01), and an increase in group B, 69.96 [69.96-89.72] and 74.97 [43.62-85] (p=0.039). For the CVFQ, only Group B showed an improvement in General Vision (p=0.049) and Competence (p=0.031) scores.

Conclusions

Myopic children treated with atropine and those using combination treatment (atropine and DIMS) do not seem to have significant differences in overall VR-QoL following 6 months of treatment. General Vision (CVFQ), Competence (CVFQ) and Eye Condition (PedEyeQ) scores improve significantly for children on combination treatment.

Rapid Fire Presentation #31 (RF31)

Atropine and spectacle lens combination treatment (ASPECT): 12-month results of a randomised controlled trial for myopia control

Authors

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Topic

Myopia

Abstract

Long title

Atropine and Spectacle Lens Combination Treatment (ASPECT): 12-month results of a randomised controlled trial for myopia control using a combination of Defocus Incorporated Multiple Segment Lenses (DIMS) and 0.025% atropine

Aim

To evaluate and compare the efficacy of combination treatment using 0.025% atropine and DIMS lenses to 0.025% atropine and single vision (SV) lenses in slowing myopia progression in myopic children.

Methods

Randomised controlled trial conducted on children aged 4-16 years with myopia between -1.00 and -6.00D and astigmatism ≤ 2.00 D. Children were randomly allocated in two groups: 0.025% atropine and SV lenses treatment group (group A) or 0.025% atropine and DIMS spectacle lenses treatment group (group B). Cycloplegic spherical equivalent refraction (SER) and axial length (AL) were measured at baseline, 6 and 12 months.

Results

102 patients completed the 12-month follow-up: n=49 in group A, mean age 9.50±2.78 years, and n=53 in group B, mean age 9.90±2.47 years. At 12 months, mean AL±SD change was 0.18±0.16mm in group A and 0.07±0.16mm in group B (mean difference: 0.11, 95% CI: 0.05 to 0.17; p<=0.001). Mean SER ±SD progression was -0.19±0.42D and -0.09±0.35D in group A and B at 12 months, respectively (p=0.13). 39.6% of children in group B had no axial elongation over 12 months, compared to 12.2% of the children in group A (p=0.002).

Conclusions

Combination treatment with 0.025% atropine and DIMS spectacle lenses is more effective in controlling axial elongation than 0.025% atropine with SV lenses. Although not significant, SER differences between groups were lower in group B. These findings support a potential additive effect of the two treatments.

Keywords

Atropine; axial elongation; defocus incorporated multiple segments; DIMS; Myopia control.

Rapid Fire Presentation #32 (RF32)

The effectiveness of orthokeratology in the treatment and prophylaxis of the progression of uncomplicated acquired monocular myopia

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Topic

Myopia

Abstract

Unilateral myopic ametropia is a condition where one eye is myopic, paired with a 'plano' eye. OK lenses provide optimal correction for monocular myopia in children, balancing visual acuity and controlling progression.

This study aimed to evaluate orthokeratology's effectiveness in treating and preventing uncomplicated monocular myopia. A retrospective cohort study included 44 patients (88 eyes), with 44 myopic eyes in the treatment group managed with OK lenses and 44 untreated pre-myopic fellow eyes in the control group. The 2-year study divided participants by myopia degree (mild or moderate), age (7-13 and 14-20 years), and family history. The untreated emmetropic eye served as a natural control, accounting for axial length differences and natural growth. Orthokeratology's absolute effectiveness was measured using the ibARAL index (intra-bilateral absolute reduction of axial length growth), calculated as: $ibARAL = B - A$, where A represents AL growth in the Ortho-K treated eye and B in the untreated eye.

The study data revealed that the annual myopia progression rate, based on spherical equivalent and axial length, decreased in all groups, with a more significant reduction in the low myopia group aged 14-20, regardless of family history. After 2 years, myopia progression stopped in over 33% of cases in the treatment group aged 7-13 and in over 50% of cases in the group aged 14-20. In the untreated group with moderate myopia, aged 7-13 with a family factor, there was the most pronounced increase in axial length. The initial ibARAL index was negative across all groups, indicating greater axial length growth in the myopic eye. By study's end, it turned positive, demonstrating orthokeratology's strong effectiveness.

In conclusion, orthokeratology is an effective treatment for unilateral myopia, controlling progression and axial length growth.

Rapid Fire Presentation #33 (RF33)

Eight years of performance of Defocus Incorporated Multiple Segments (DIMS) spectacle lenses: User experience and myopia management outcomes

Authors

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Topic

Myopia

Abstract

Purpose

To evaluate the long-term safety, effectiveness and user experience in participants wearing Defocus Incorporated Multiple Segments (DIMS) spectacle lenses.

Methods

The participants who completed the 2-year randomised controlled trial (RCT) and 6-year follow-up study (n=90) were invited for the 8-year follow-up visit. The participants were eight years older, aged from 16- to 21-year-old. Consenting participants were interviewed (face-to-face or by telephone) about their current optical correction and experiences with DIMS spectacle lenses. Non-cycloplegic refractions and axial length were measured.

Results

Participants who wore DIMS spectacle lenses for 8 years experienced a mean myopia progression of -0.44 ± 0.64 D and axial elongation of 0.46 ± 0.64 mm. In contrast, participants with less than 8 years of DIMS wear showed a mean myopia progression of -1.44 ± 1.31 D and axial elongation of 0.88 ± 0.56 mm. Those in the 8-year group demonstrated statistically significant reductions in myopia progression by 1.00 ± 0.41 D ($p=0.017$) and axial elongation by 0.42 ± 0.18 mm ($p=0.019$) compared to the less-than-8-year group.

Conclusion

Continuous long-term use of DIMS spectacle lenses for 8 years significantly reduces myopia progression and axial elongation compared to shorter durations. These findings highlight the long-term benefits of consistent DIMS spectacle lens usage in controlling myopia.

Rapid Fire Presentation #34 (RF34)

Multi-Site observational study of Defocus Incorporated Multiple Segments (DIMS) spectacle lenses in UK children: 2-year results

Author

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Topic

Myopia

Abstract

Purpose

An observational study exploring efficacy of Defocus Incorporated Multiple Segment (DIMS) lenses in controlling myopia over 2 years in UK children. The results were compared to published findings in Chinese children wearing DIMS lenses, to evaluate efficacy across ethnicities (Lam et al, 2020).

Methods

Recruits were aged 5–15-years with cycloplegic spherical equivalent (SE) of -0.50 to -8.50 D, anisometropia ≤ 1.50 D and astigmatism ≤ 2.50 D. All were prescribed DIMS spectacle lenses. SE and axial length (AL) were measured at baseline and 6-monthly intervals for 2 years. Axial elongation in the 1st and 2nd year was compared to age- and population-matched eye growth of myopes wearing single vision correction (virtual controls) (Bullimore & Brennan, 2024). Cumulative two-year change in AL and SER from a subgroup (age and refractive error matched) were compared with published data on Chinese children wearing DIMS.

Results

One- and two-year data are presented from 103 participants. SE and AL changed by -0.33 ± 0.41 D and 0.17 ± 0.19 mm, and -0.23 ± 0.36 D and 0.12 ± 0.13 mm over the 1st and 2nd year, respectively. Compared to virtual controls, children wearing DIMS showed on average 0.16 ± 0.13 mm less elongation over the 1st and 0.15 ± 0.12 mm over the 2nd year of wear. 85% of participants showed slower than untreated myopic eye growth in the 1st year, increasing to 89% in the 2nd year. The sub-group of UK children with baseline age and refractive error matched to a Chinese cohort (age 8–13-years, SE -1.00 to -5.00 D, astigmatism ≤ 1.50 D; $n=59$) showed no significant difference in two-year cumulative change in SE (UK -0.46 ± 0.48 D vs Chinese -0.41 D; $p=0.39$) and AL (UK 0.23 ± 0.22 mm vs Chinese 0.21 mm, $p=0.40$).

Conclusions

Compared with the expected age-normative myopic eye growth, DIMS spectacle lenses effectively slowed eye growth in most UK wearers in both year 1 and year 2 of wear. DIMS spectacle lenses performed equally well among UK and Chinese children.

Rapid Fire Presentation #35 (RF35)

Advances in myopia management: Evidence-based ophthalmic lenses interventions

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Topic

Myopia

Abstract

Background

The global prevalence of myopia has risen significantly, affecting regions from East Asia to Europe [1]. Research indicates that factors such as prolonged near work, reduced outdoor time, and genetic predisposition increase the risk of myopia in children [2]. Consequently, the World Council of Optometry advocates for myopia management as the standard of care for optometrists [3]. While single vision spectacle lenses remain the most prescribed solution for myopes, emerging evidence supports a range of other interventions for effective myopia management [4]. Addressing myopia is essential, and practitioners must select appropriate interventions to slow its progression in children. One promising avenue is the use of anti-myopia ophthalmic lenses, which are increasingly available across Europe, the U.S., Canada, and especially in Asia [5].

Purpose

This presentation will equip Eye Care Practitioners with knowledge of the latest evidence-based interventions for myopia management, ensuring they remain informed as new options become available.

Content

This presentation will provide a detailed explanation of how each lens is designed, including concepts such as peripheral defocus, reduced contrast, and cylindrical annular refractive elements. We will cover the available prescription ranges and the efficacy of each lens. At least eight different evidence-based lenses will be explored in depth, supported by illustrations and diagrams. Additionally, lenses currently undergoing testing but not yet available on the market will also be discussed. [6,7,8,9,10,11,12].

Recommendations/Conclusions

Each market can utilize data relevant to the lenses available within their region. As new products become available, this presentation can serve as a reference for Eye Care Practitioners (ECPs). It is crucial to select the most appropriate ophthalmic lens for each child by considering various factors, including prescription (Rx), prescription range, lens material, and price. Additionally, frame selection is equally important.

References available from the author, on request.

“STUDENT RESEARCHER AND EARLY CAREER RESEARCHER” ABSTRACTS

Early Career Rapid Fire Presentation #1 (EC1)

Efficacy of school-led vision checks in secondary-school students within the UK.

Authors

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Topic

Student and Early Career Research

Abstract

Purpose

In UK schools, vision screening happens only once, on school entry (age 4–5 years). Consequently, significant refractive error, which may develop in later childhood, could go undetected, possibly impeding educational attainment. School-led vision checking, where school personnel assess vision, is increasingly advocated by the International Agency for the Prevention of Blindness, to detect unnoticed visual problems (<https://www.iapb.org/learn/resources/school-eye-health-guidelines/>). This study investigates the efficacy of school-led vision checking in UK secondary school students.

Methods

School personnel were trained to perform vision checks on children aged 11 to 13 years. Checks included external observation for obvious ocular abnormality, alongside checks on monocular distance (3m) and near visual acuity (33cm). Optometrists repeated assessments within 4 weeks to determine the accuracy of school-led checks. Habitual visual acuity, poorer than 0.20logMAR, in one or both eyes (at distance or near) and/or presence of any abnormality led to a “failure”. Ethical approval was given for an opt-out participation method.

Results

629 (56.70% male) students from three schools participated. 3 (0.5%) students failed vision checks due to ocular abnormality. Sensitivity and specificity of distance vision checks, including ocular abnormality, were 74.0% and 89.0%, respectively. The number of true positives ($n=71$, 74%) and negative predictive value (94.4%), suggest school staff correctly identified most children with distance vision problems. Distance vision screening resulted in 54 (11.4%) false positives, giving a positive predictive value of 56.8%. With near vision criteria included, sensitivity and specificity were 77.9% and 81.2%, respectively. With near vision added, the positive predictive value was 47.6%, from increased numbers of false positives ($n=97$, 18.8%).

Conclusions

School-led vision checking is feasible and can correctly identify UK school children with and without visual problems. This type of vision checking can viably supplement screening on school entry, and may be beneficial in detecting significant refractive errors, particularly myopia development.

Early Career Rapid Fire Presentation #2 (EC2)

Retinal nerve fibre layer and ganglion cell layer thinning in children with cerebral visual impairment compared to controls

Authors

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Topic

Student and Early Career Research

Abstract

Purpose

Children with cerebral visual impairment (CVI) show retinal abnormalities due to retrograde transsynaptic degeneration (RTSD). The aim of this study is to investigate the peripapillary retinal nerve fibre layer (pRNFL) and ganglion cell layer + inner plexiform layer complex (GCL+IPL) thickness in children with CVI compared to an age-matched control group.

Methods

We included 85 children diagnosed with CVI (due to perinatal damage or anomaly of brain; median IQR; 10 years [8-14]; 46% females) and a control group of 47 children (11 years [8-14]; 36% females) with a normal birth history and no abnormalities in the retina or optic nerve. Topcon triton optical coherence tomography (OCT) measurements were obtained in all children with the 12mm x 9mm wide scan mode. Two-eye averaged pRNFL and GCL+IPL thicknesses were compared between the CVI and the control group using non-parametric tests. Analyses was corrected for multiple hypothesis testing using false discovery rate (FDR).

Results

Children with CVI had thinner pRNFL thickness compared to the control group in the superior, nasal, inferior and temporal sectors (total mean pRNFL thickness - median [IQR] CVI group: 97.50 μ m [81.53-110.59], control group: 109 μ m [103.68-115.81]; FDR corrected p value in all sectors $p < 0.001$). We also found thinner GCL+IPL complex thickness in the temporal superior, superior, nasal superior, nasal inferior, inferior and temporal inferior sectors, in children with CVI compared to controls (total mean GCL+IPL thickness - median [IQR] CVI group: 68.00 μ m [62.50-74.22], control group: 72.83 μ m [69.58-76.33]; $q = 0.01$ to 0.001).

Conclusions

The reduced pRNFL and GCL+IPL complex thickness in children with CVI is attributed to possible retrograde transsynaptic degenerative damage along with the influence of onset, severity and extent of brain damage. Hence, the pRNFL and GCL+IPL thickness could be crucial parameters in diagnosing children with CVI clinically.

Early Career Rapid Fire Presentation #3 (EC3)

Influence of different types of astigmatism on myopia progression in children wearing defocus incorporated multiple segments spectacles

Authors

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Topic

Student and Early Career Research

Abstract

Purpose

Genetic and environmental factors are well evidenced to influence myopia progression. Little is known about the effect of astigmatism on myopia progression. This retrospective study aims to investigate the correlation between progressive myopia and astigmatism focusing on the influence of the type of astigmatism on myopia progression in children undergoing myopia management with Defocus Incorporated Multiple Segments (DIMS) spectacles.

Methods

Relevant data from two anonymised data sets were obtained for analysis: an Asian population aged 8-13 years, and a Caucasian population aged 5-15 years. Each participant's refractive error was classified into one of four categories: spherical, with-the-rule (WTR), oblique or against-the-rule (ATR) astigmatism. The myopia progression was evaluated by the change in Spherical Equivalent Refraction (SER) and axial elongation (AL) between baseline and 24-month (24M) follow-up visit.

Results

Retrospective right eye data for 184 children (79 Asian & 105 European) were analysed. The Asian participants were sub-classified as spherical (n=24), WTR (n=36), Oblique (n=17) or ATR (n=2); European participants were sub-classified as spherical (n=32), WTR (n=38), Oblique (n=27) or ATR (n=8) based on their refractive errors. One-way ANOVA analysis of both data sets showed no significant difference in either SER and AL changes within or between the four different categories at 24M. Independent analysis of both data sets indicated that participants with WTR astigmatism had the least myopia progression. Analysis of the two datasets combined also found that participants with WTR had the least progression and participants with ATR astigmatism had the most myopia progression.

Conclusions

Initial analysis shows that myopic participants with WTR using DIMS spectacle lenses have less myopia progression compared to participants with oblique or ATR. Long-term investigations in patients with different types of astigmatism undergoing myopia management are required to better understand the correlation between progressive myopia and different types of astigmatism.

Early Career Rapid Fire Presentation #4 (EC4)

Vision-related quality of life in patients suffering from coexisting glaucoma and cataract

Authors

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Topic

Student and Early Career Research

Abstract

Purpose

To evaluate the QoL and vision-related QoL in patients suffering from coexisting glaucoma and cataract.

Methods

This cross-sectional-analytical study was carried out on 222 cases including 163 patients suffering from coexisting glaucoma and cataract as the patients' group and 59 healthy individuals as the control group. Data was gathered via the use of EuroQol five-dimensional (EQ-5D) and National Eye Institute-Visual Functioning Questionnaire 39 (NEI-VFQ 39). Then, the results obtained were compared before and one month after cataract surgery in patients and control groups.

Results

The mean and 95% confidence interval of overall vision-related QoL scores in healthy individuals and patients during pre- and post-operative phases were 86.65 (69.3 – 104.0), 48.7 (9.4 – 88.1) and 56.1 (12.2 – 100.0), respectively. There were significant differences among the three groups compared in terms of all NEI-VFQ 39 items ($P < 0.05$). The mean and confidence interval of EQ-5D score during pre- and post-operative phases were 0.42 (0.21-0.64) and 0.58 (0.39-0.78), respectively ($P = 0.017$) and for healthy individuals, it was 0.70 (0.59-0.80). After surgery, all QoL items significantly increased among patients ($P < 0.05$). Also, there were significant differences in the scores compared to healthy individuals ($P < 0.05$). One month after surgery, all QoL items' scores obtained by NEI-VFQ 39 and all QoL items' scores obtained by EQ-5D were significantly lower in the treated patients than in healthy individuals ($P < 0.05$).

Conclusions

In patients suffering from coexisting glaucoma and cataract, the overall QoL and vision-related QoL scores were improved after cataract surgery. However, there was a significant difference between them and healthy individuals; with the healthy group having superior score than both patient groups.

Keywords

Quality of Life; Visual Function; Cataract; Glaucoma.

Early Career Rapid Fire Presentation #5 (EC5)

Seasonal differences in axial elongation in young adults

Authors

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Topic

Student and Early Career Research

Abstract

Purpose

The aim of this study was to estimate the rate of axial elongation over 18 months within a cohort of young adults.

Methods

Within a higher education cohort, 185 young adults aged 18-25 were enrolled in a prospective longitudinal study. Measurements of non-cycloplegic autorefractometry (NVision-K 5001, Shin Nippon: Japan) and axial length (IOLMaster, Zeiss: Germany) were obtained at 0, 6, 12, and 18 months. At 18 months, participants with axial length (AL) increase $>+0.06$ mm were termed 'progressors', while those with $\leq+0.06$ mm change were termed 'stable'. This criterion was derived from the expected diurnal variation of AL and the intersession reproducibility of the IOLMaster. The differences in progression rates between study visits were analysed with repeated measures ANOVA.

Results

Eighteen-month data was available for 147 participants. Baseline AL was $23.93(\pm 1.00)$ mm. Mean change in AL over 18 months was $+0.04(\pm 0.08)$ mm. At the conclusion of the study, 44 (29.9%) participants were found to be progressors, with the remaining found to be stable. Mean AL change for the progressors was $+0.14(\pm 0.07)$ mm, with a corresponding average SER change of $-0.34(\pm 0.38)$ D. Complete data for each study visit was available for 118 participants. AL changes were found to be significantly different across the study visits ($F(1.5, 174.0)=6.953, p=0.003$). The 0-6- and 12-18-months periods (October to March, winter period) showed significantly greater elongation than in the 6-12-month period (April to September, summer period) after Bonferroni adjustment ($p=0.050$ and $p=0.001$, respectively). There was no difference in progression between the two winter periods ($p=1.000$). When separated, this pattern held true for the AL progressors ($F(1.6, 54.0)=10.622, p=0.001$) but not the stables ($F(1.5, 120.0)=1.937, p=0.160$).

Conclusions

A minority of young adults in higher education exhibit axial elongation and accompanied myopic shifts. For those progressing, rates appear greater in winter than summer, inferring potential seasonality difference in progression.

Early Career Rapid Fire Presentation #6 (EC6)

Application of an ultrasound massage device for dry eye disease

Authors

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Topic

Student and Early Career Research

Abstract

Aim

To explore the application and effects of an ultrasound eye lid massaging with additional warming on the lower eyelids (TOUCHBeauty) of patients with dry eye disease (DED).

Methods

Patients with DED were recruited, based on the Tear Film and Ocular Surface Society DEWS II Workshop classification. Tear meniscus height (TMH), non-invasive tear breakup time (NIKBUT) and lipid layer thickness were recorded at baseline with means of the Keratograph 5 M (Oculus GmbH). The lid massage with additional warming (42°C) was subsequently applied to the lower eyelids of only one eye for the duration of one minute, and the clinical measurements were repeated on both eyes.

Results

Sixteen patients participated (10 females, mean age 51.9±8.9 years). Significant differences in TMH ($p=0.034$) and NIKBUT ($p=0.019$) were found ten minutes after application between the treated and the fellow untreated eyes. No statistically significant difference however was observed for lipid layer thickness. 68% of the participants showed spontaneous improvement in dry eye symptoms: A mean statistically not significant difference in the SANDE score of 1.96±13.94 was obtained ($p=0.581$).

Conclusions

This pilot study observed a trend for improvement in objective and subjective variables following the application of an ultrasound eye lid massaging device with additional eyelid warming. This warrants further investigation with a prolonged treatment on a larger sample size.

Early Career Rapid Fire Presentation #7 (EC7)

Evaluation of new methods for subjective refraction in times of digital change

Authors

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Topic

Student and Early Career Research

Abstract

Aim

To compare refraction results of the online eye exam by Easee (www.easee.online), the VisionCheck by EyeQue (www.eyequ.com) with those of conventional subjective refraction (SR).

Methods

This prospective experimental study with a randomized measurement procedure involved 29 participants (age 25 ±3 years). At outset, the axes of the cylinder of the current spectacles were rotated, depending on the cylinder strength and to varying degrees, applying the limits of the DIN EN ISO 21987 standard table, with an additional 5°. The examiners were blinded to the prescription values in the participants' spectacles. Patients indicated their preference for the most convenient refraction procedure via an anonymous online survey. For statistical evaluation of the differences, all measurement data were converted to the independent power vectors spherical equivalent (SAE), J0, J45 and total astigmatic difference (TAD).

Results

No significant difference was found for SAE between the three measurement methods ($p=0.1253$). J0 was statically significant (SR vs. Easee: $p=0.0345$; SR vs. EyeQue: $p<=0.001$; Easee vs. EyeQue: $p<=0.001$). J45 was statistically significant for pairwise comparison of SR with EyeQue ($p=0.042$). The 95% confidence intervals (Bland Altman) for SAE were [-0.57; +0.59] for SR vs. Easee and [-1.85; +1.71] for SR vs. EyeQue. The TAD was 0.40+/-0.26 for SR vs. Easee and 0.63+/-0.50 for SR vs. EyeQue. In the 46 (of a total of 54) eyes with cylindrical correction, the random rotation of the cylinder axis was not detected by Easee, as the maximum change applied was only 2°. All respondents preferred their next eye examination to be performed in an optometric practice.

Conclusions

Web-based measurement methods were not found to deliver sufficiently accurate spectacle prescriptions in this study, as statistically and clinically significant differences were found. These new refraction methods should therefore be applied with caution.

Early Career Rapid Fire Presentation #8 (EC8)

Evaluating refractive error prevalence in children in Europe: A comparative analysis of cycloplegic and non-cycloplegic studies

Authors

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Topic

Student and Early Career Research

Abstract

Purpose

This meta-analysis estimated clinically significant refractive error prevalence in children in Europe, comparing cycloplegic and non-cycloplegic prevalence rates, and analysing differences by age and sex.

Methods

A systematic review (PubMed, Cochrane Library, PROSPERO ID: CRD42022322608) included studies from January 2000 to June 2024 reporting hyperopia ($\geq +2.00D$), astigmatism ($\geq 1.00DC$) and myopia ($\leq -0.50D$) prevalence in 4–17-year-old children in Europe. Eligible studies (38,085 participants) from 15 countries included population-, school- and clinic-based studies. Estimated pooled prevalences (EPP) with 95% confidence intervals (CI) were calculated separately for cycloplegic and non-cycloplegic studies using a random-effects model with Freeman-Tukey double-arcsine transformation. Subgroup analyses assessed cycloplegic data by age and sex.

Results

Cycloplegic myopia prevalence was 12.12% (95% CI: 10.01, 14.40; 12 studies) and 13.24% (10.26, 16.54; seven studies) in non-cycloplegic studies. Cycloplegic hyperopia prevalence was 9.87% (6.44, 13.92; nine studies) and 7.93% (2.37, 16.32; two studies) in non-cycloplegic studies. Astigmatism prevalence from cycloplegic studies was 10.75% (3.65, 20.93; four studies) and did not vary significantly with age. Only one non-cycloplegic study reported astigmatism prevalence, limiting EPP calculation. Hyperopia decreased with age (17.02% (4–9 years), 7.06% (10–13 years)), while myopia increased (6.22% (4–9 years), 16.66% (14+ years)). Myopia prevalence was similar between sexes ($Q=0.00$, $p=0.96$), but subgroup analyses by sex were limited for hyperopia and astigmatism. Data from 26 countries were unavailable, limiting regional comparison.

Conclusions

Approximately 10% of European children exhibit clinically significant refractive errors. Myopia was most common (highest prevalence: United Kingdom), then astigmatism and hyperopia (highest prevalences: Northern Ireland). Varying refractive error definitions complicated comparisons. Additional studies using standardised protocols (like the Refractive Error Study in Children) including hyperopia and astigmatism prevalence by sex, are necessary in countries without existing data to inform optometric management across Europe.

Early Career Rapid Fire Presentation #9 (EC9)

Plusoptix A04 accuracy measuring interpupillary distance and pupil size

Authors

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Topic

Student and Early Career Research

Abstract

Purpose

The Plusoptix A04 is a photo-refractor mainly used for vision screening in pediatric populations. It provides several parameters, including interpupillary distance and pupil size. According to the Plusoptix manual, the device works within a range of 95 to 105 cm from the subject; however, its wide depth of focus allows it to capture measurements beyond this range. The aim of this study was to evaluate the accuracy and variability of Plusoptix measurements for these two parameters at different distances between the subject and the device.

Methods

Three subjects were measured using automatic mode, with 5 measurements taken at 6 different distances in 3 cm increments. Measurement variability was also assessed by comparing measurements taken when starting close to the subject and moving the Plusoptix backward with those taken when starting farther from the subject and moving it forward.

Results

A linear relationship was observed between the measured pupil size, interpupillary distance, and the separation between the subject and the Plusoptix; Greater separation corresponded to smaller pupil size and interpupillary distance values, with an average change of 12%. Additionally, less variability was observed when the device was initially positioned close to the subject and moved backward, as opposed to starting farther away and moving it forward.

Conclusions

The pupil size and interpupillary distance values obtained with the Plusoptix are influenced by the distance between the device and the subject. Measurement accuracy is higher, and variability is reduced, when the Plusoptix is positioned close to the subject and moved backward until an automatic measurement is taken.

POSTER PRESENTATIONS ABSTRACTS

Poster Presentation #1 (P1)

The features of conjunctival cytology in individuals with nasolacrimal duct obstruction

Authors

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Topic

Clinical

Abstract

This research compares the effectiveness and results of endoscopic and external dacryocystorhinostomy (DCR) for patients with nasolacrimal duct obstruction (NDO).

Background and objective

Epiphora, or excessive tearing, in adults is frequently caused by nasolacrimal duct obstruction. External DCR has been used in traditional surgical intervention; however, endoscopic procedures have become more common because they are less intrusive and require shorter recovery times. To better understand the differences between external and endoscopic DCR treatments in NDO patients, this study compared their success rates, recovery times, and postoperative complications.

Methods

This study included 20 patients with unilateral NDO who had been followed up for at least a year.

Results

The age of the patient's group is between 18 and 60 years old. The mean period for complaints of epiphora was under the range of 2–6 years. The NDO eye had a mean squamous metaplasia grade of 2.28 ± 0.69 , while the control eyes' grade was 1.89 ± 0.84 ($p = 0.011$). For eyes with NDO, the mean grade of goblet cell density was 2.1 ± 0.5 , while for control eyes it was 2.48 ± 0.55 ($p = 0.013$). Conjunctival cytological characteristics, including squamous metaplasia and goblet cell density grades, did not significantly correlate with the length of epiphora complaint ($r = -0.04$, $p = 0.82$; $r = 0.09$, $p = 0.66$, respectively).

Conclusions

The impression cytology of the conjunctival may change because of NDO. The health of the ocular surface will be safeguarded by successful dacryocystorhinostomy procedures.

Poster Presentation #2 (PP2)

Innovative pedagogical approaches in optometry: Enhancing learning through technology and collaboration

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Topic

Education

Abstract

Optometry education has traditionally relied on lecture-based teaching and rote memorization, which, while effective for conveying theoretical knowledge, often leave students underprepared for clinical practice. This gap highlights the need for innovative approaches that foster critical thinking, problem-solving, and practical skills essential for patient care in the modern healthcare landscape. Emerging pedagogical strategies, such as Team-Based Learning (TBL), Case-Based Learning (CBL), and Problem-Based Learning (PBL), have demonstrated success in healthcare education by encouraging active engagement and collaborative problem-solving. While these methods are increasingly common in medical and nursing curricula, their adoption in optometry education remains limited. Similarly, simulation technologies, including virtual patient platforms and diagnostic simulators, offer untapped opportunities for bridging the gap between classroom theory and clinical practice in optometry. This conceptual study proposes a framework for integrating these methods into optometric education, focusing on enhancing critical skills such as clinical decision-making, patient communication, and interdisciplinary teamwork. While formal research on these interventions in optometry education is limited, insights from other healthcare disciplines suggest significant potential benefits. Early adopters report improved student engagement, knowledge retention, and confidence in applying theoretical knowledge to clinical scenarios. This proposal outlines a roadmap for implementing active learning strategies and simulation technologies within optometric training programs, emphasizing their alignment with the demands of modern clinical practice. To prepare students for the evolving landscape of optometric care, institutions must embrace innovative teaching methodologies that prioritize learning via simulation and collaboration. Future research should focus on pilot implementations of these approaches in optometry education, evaluating their impact on clinical skills, confidence, and patient outcomes.

Poster Presentation #3 (PP3)

Supplementation in maintaining visual homeostasis

Author

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Topic

Clinical

Abstract

In light of the rapidly advancing knowledge in eye health, this presentation seeks to explore key relationships between targeted supplementation and maintaining macro-element balance, which is essential for optimal visual system function.

The first part of the lecture will analyze interactions among microelements and their impact on eye health, emphasizing the intricate network of dependencies and discussing supplementation methods that support visual homeostasis.

The second part will focus on the importance of micro elements found in foods and dietary supplements, which exert both direct and indirect effects on the visual system. Utilizing appropriate combinations of macro-elements can support efficient metabolism and play a role in preventing various eye diseases. This segment will provide a basis for discussing the protective roles of vitamins and minerals in visual health.

The final section will delve into the increasing interest in carotenoids, particularly lutein and zeaxanthin, and their potential to prevent age-related macular degeneration, cataracts, and other ocular conditions. An innovative, non-invasive method for measuring carotenoid levels will be introduced, designed to be easily integrated into standard optometric practice. This technique will enable precise customization of supplementation to meet individual patient needs and allow ongoing monitoring of changes in eye health.

Ultimately, the presentation will underscore the importance of an interdisciplinary approach in advancing visual health through targeted supplementation.

Poster Presentation #4 (PP4)

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

Authors

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Topic

Clinical

Abstract

Background

The standard of care for corneal edema associated with Fuchs' endothelial corneal dystrophy is sodium chloride 5% ophthalmic solution and ointment. Patients are advised to apply warm air to the cornea in the morning for dehydration. In cases where intraocular pressure exceeds 20 mmHg, IOP-lowering agents are recommended. Recent literature reports a reduction in corneal edema in eyes with Fuchs' dystrophy treated with netarsudil ophthalmic solution, showing promising potential for therapeutic intervention.

Methods

A 97-year-old male presented with bilateral corneal edema associated with Fuchs' dystrophy. Entrance visual acuity was 6/21 OD and 6/15 OS. Central corneal thickness was 657 OD and 605 OS. Biomicroscopy revealed corneal haze and endothelial folds. IOP was 14 mmHg OD and 16 mmHg by applanation. Endothelial cell count yielded 765 cells/mm² OD and 724 OS. The patient started sodium chloride solution four times per day and ointment at bedtime. At the 2-week follow-up there was a noted improvement in corneal haze, however, the folds persisted and there was no significant reduction in central corneal thickness. Netarsudil 0.02% ophthalmic solution was added at bedtime to the management regimen.

Results

After 4 months, there was a small improvement in visual acuity (5/15 OD and OS), a significant reduction of endothelial folds, and a decrease in central corneal thickness in both eyes (596 OD and 579 OS). The patient did not develop any side effects commonly associated with the use of netarsudil.

Conclusions

In summary, netarsudil is a treatment option for corneal edema associated with Fuchs' endothelial cornea dystrophy. Clinicians should be aware of the potential side effects of conjunctival hyperemia, corneal verticillata, subconjunctival hemorrhage, and reticular honeycomb hypertrophy/corneal epithelial cysts associated with the use of netarsudil.

Poster Presentation #5 (PP5)

Prism prescribed using TNO stereotest results out-performs fixation disparity

Authors

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Topic

Clinical

Abstract

Introduction

Prism prescribing for decompensating exophoria by Sheard's Criterion or by Fixation Disparity (FD) has had limited success. Neither method considers stereopsis in their investigation, despite the majority of decompensating exophorias showing reduced global stereopsis (Momeni-Moghadam et al. 2011; Vancleef et al. 2017). At EAOO 2024 we showed TNO-based prism prescribing outperformed Sheard's criterion. In this study, we investigate the comparison to FD.

Methods

51 symptomatic exophores were recruited from a binocular vision clinic. In a randomized double-blinded crossover study, two values of prismatic correction (TNO and FD based) were calculated and prescribed. The TNO method identified the minimum prism required to maximize stereopsis. FD was by the established neutralising technique.

Results

There was a statistically significant difference between the TNO and FD prisms (13.1 and 9.67 respectively, $p < 0.05$). Stereopsis with Titmus / TNO improved from a baseline of 217.25 (SD 127.12) / 369.0 (SD 193.22) to 50.20 (SD 11.91) / 57.94 (SD 34.34) with the FD prism, and to 43.53 (SD 5.94) / 43.53 (SD 25.15) with the TNO prism. Each prism was worn for 1.5 months. A CISS questionnaire was filled in at baseline and after each period of prismatic correction. There was a statistically significant reduction in symptoms (CISS scores 40.9 +/- 6.5 at baseline), more so for TNO than for FD (final CISS scores 27 SD 6.63 for FD and 22 SD 5.03 for TNO, $p < 0.01$).

Conclusions

The novel TNO method has given a greater prism than FD and, crucially, this has delivered better stereopsis and a greater level of symptom relief, approaching the normal CISS cut off of 21. We conclude that incorporating stereo performance into prism prescribing can give a better clinical outcome for decompensating near exophoria.

Poster Presentation #6 (PP6)

Impact of coloured cosmetic contact lenses on visual quality

Author

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Topic

Clinical

Abstract

Purpose

Coloured cosmetic contact lenses can impair visual quality due to an increase in optical aberrations. However, less is known about changes in retinal straylight when wearing coloured contact lenses. This study aimed to assess the impact of coloured cosmetic contact lenses on retinal straylight and low-contrast visual acuity.

Methods

Twenty participants (mean age 25 ± 3.5 years) were included in the study. Participants spherical equivalent refraction ranged from -7.50 D to $+3.50$ D, with an average refraction of -0.70 ± 3.5 D. Retinal straylight and low-contrast visual acuity were assessed with both transparent and coloured cosmetic soft contact lenses. Retinal straylight was measured using the C-Quant straylight meter (Oculus), with results expressed as the decimal logarithm of the straylight parameter $\log(s)$. Visual acuity was measured using the FrACT software program, with optotypes presented at a Weber contrast of -5% (Michelson contrast 3%). The Kolmogorov–Smirnov test was applied to assess the normality of data distributions, and average values between groups were compared using a one-tailed dependent samples t-test.

Results

No significant difference in the retinal straylight parameter $\log(s)$ was observed between transparent contact lenses ($M = 0.95$, $SD = 0.19$) and coloured contact lenses ($M = 0.94$, $SD = 0.18$), $t(19) = 1.74$, $p = 0.47$. Low-contrast visual acuity was significantly lower with coloured contact lenses ($M = 0.53$ logMAR, $SD = 0.19$) compared to transparent contact lenses ($M = 0.41$ logMAR, $SD = 0.20$), $t(19) = 1.72$, $p = 0.0004$.

Conclusions

Coloured cosmetic contact lenses reduce visual quality. This reduction in visual quality is not primarily associated with increased retinal straylight.

Poster Presentation #7 (PP7)

Evaluating wearer experience of the next-generation progressive lens Biometrics Horizon

Authors

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Topic

Clinical

Abstract

Purpose

A new progressive power lens (PPL) based on a new calculation method has been developed. It consists of a PPL design where the power distribution varies according to wearer prescriptions. Thanks to a computing algorithm that modulates the power distribution (mean and cylindrical powers), a personalized PPL design geometry is created considering the visual demands of the user for distance and near vision. The goal of this pilot study is to validate the proposed method to calculate PPL.

Methods

Observational and prospective wearer trial in which a group of PPL wearers tested Biometrics Horizon lenses (Optiswiss, Switzerland). Subjects were asked to wear the lenses for 7 days and score their subjective wearing experience when they wore the lenses for first time and after 7 days of use. A satisfaction survey with scale from 1 (worst) to 5 (best) was assessed to evaluate wearing experience for different vision distances and activities. Percentages of satisfaction were calculated as the percentage of subjects that provides a satisfaction score ≥ 3 .

Results

The sample comprised 30 subjects with an average prescription of $-0.68 \pm 2.28D$ (from $-5.75D$ to $+3.00D$) in spherical power, -0.54 ± 0.37 (from 0 to $3.00D$) in cylindrical power and $1.92 \pm 0.48D$ additions (from $1.00D$ to $2.50D$). During first impression evaluation, percentages of satisfaction were 97% for walking at the street, 77% when using the laptop, 97% when reading a newspaper and 97% for overall use. After using the lenses for 7 days, percentages of satisfaction rates were 97% for overall tasks, 97% for distance vision, 90% for intermediate, near vision and using electronic devices. The adaptation period was ≤ 24 hours in 77% of users and ≤ 7 days in 93% of users.

Conclusions

Biometrics Horizon lenses provide excellent performance and subjective wearer experience, validating that the new method for calculating PPL is reliable and effective.

Poster Presentation #8 (PP8)

Reliability of near point of convergence – how many measurements to take?

Authors

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Topic

Clinical

Abstract

Purpose

The study aimed to evaluate how many measurements of near point of convergence (NPC) are required to obtain reliable results.

Methods

100 subjects aged 19–60 yrs (mean 32.8±13.2) participated in the study. The exclusion criteria were no vision in one eye, strabismus, diplopia, near visual acuity < 20/40, stereopsis > 80". Near visual acuity, a cover test, and Titmus stereo test were performed. Then NPC was measured objectively 10 times using a Wolff fixation wand. For each measurement, fusion break and recovery were noted. The Shapiro-Wilk test was used to verify normal distribution. Comparisons of multiple results from the first measurement, the mean of 3, 5, and 10 measurements were made using Friedman's ANOVA analysis of variance of dependent samples.

Results

The mean fusion break of NPC of the first measurement of all participants was 3.3±1.6 cm. Means of 3, 5, and 10 measurements were 3.4±1.6 cm, 3.6±1.6 cm, and 3.9±1.8 cm, respectively. The mean fusion recovery of the first measurement was 4.7±2.9 cm. Means fusion recovery of 3, 5, and 10 measurements were 5.2±3.0 cm, 5.5±3.1 cm, and 6.0±3.3 cm, respectively. For the fusion break, there was no statistically significant difference between the first measurement and the average of the 3. The difference was significant for the first and the mean of 5 measurements. The largest difference occurred when comparing the first measurement with the average of 10. For the fusion break, all compared differences were statistically significant. The largest difference occurred between the first measurement and the average of 10, and the smallest between the averages of 3 and 5 measurements.

Conclusions

A single measurement of the NPC is not recommended. Repeating the measurements a minimum of 3 and preferably 5 times will allow to obtain a more reliable result and observe the trend of subsequent measurements.

Poster Presentation #9 (PP9)

Diagnostic accuracy and reliability of dry eye questionnaires: A systematic review and meta-analysis

Authors

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Topic

Clinical

Abstract

Purpose

Dry eye disease (DED) impacts quality of life and requires both symptom assessment and clinical tests for diagnosis. Despite weak correlations between patient-reported symptoms and clinical signs, validated symptom assessment questionnaires remain the most reliable diagnostic criterion. Several studies have assessed diagnostic accuracy and reliability of validated questionnaires in different populations and settings, with varied results. This study systematically reviews and summarizes the diagnostic accuracy and reliability of DED questionnaires.

Methods

An online search of PubMed, Web of Science, and Scopus was conducted on February 25, 2024, for studies on these questionnaires: 5-Item Dry Eye Questionnaire (DEQ-5), McMonnies' Questionnaire (MQ), Ocular Surface Disease Index (OSDI), Symptom Assessment in Dry Eye (SANDE), Standard Patient Evaluation of Eye Dryness (SPEED), 8-Item Contact Lens Dry Eye Questionnaire (CLDEQ-8), and Dry Eye-Related Quality-of-Life Score (DEQS). Sensitivity and specificity estimate at diagnostic thresholds were generated through separate pooling and summary receiver operating characteristic (SROC) curve using Moses-Littenberg model (MetaDisc version 1.4). Reliability was assessed through meta-analysis of Cronbach's alpha following Rodriguez and Maeda's methodology.

Results

Forty-one studies were included. For DEQ-5, sensitivity (95% CI) and specificity (95% CI) at threshold ≥ 6 were 0.86(0.82-0.90) and 0.50(0.42-0.57), respectively. MQ showed sensitivity and specificity of 0.88(0.88-0.88) and 0.48(0.48-0.49) at 11.5 threshold, and 0.54(0.47-0.60) and 0.80(0.76-0.84) at >14 . Sensitivity and specificity for OSDI, SPEED, SANDE and CLDEQ-8 could not be estimated due to limited studies at any single threshold. AUC(SE) of the SROC were: DEQ-5=0.887(0.034); OSDI=0.820(0.031); MQ=0.804(0.046); SPEED=0.792(0.021); 8-Item CLDEQ=0.720(0.008); SANDE=0.702(0.041). Pooled reliability (Cronbach alpha) was: DEQS=0.925; OSDI=0.906; CLDEQ-8=0.899; SPEED=0.881; DEQ-5=0.842; MQ=0.55.

Conclusions

DEQ-5 demonstrated the best diagnostic accuracy, while DEQS exhibited the highest reliability. DEQ-5 and OSDI had the best combination of diagnostic accuracy and reliability, with MQ showing the poorest. Variability in diagnostic thresholds highlights the need for standardizing these diagnostic tools for future study comparability.

Poster Presentation #10 (PP10)

Outer retina barrier vulnerability in HIV: Analyzing the role of choroidal vascular risk factors

Authors

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Topic

Clinical/Medical

Abstract

Purpose

The photoreceptor layer (PRL) of the outer retina is vital for visual function, including acuity, colour vision, and contrast sensitivity. Changes in PRL thickness can disrupt these functions. This study evaluates a novel spectral-domain optical coherence tomography (SD-OCT) segmentation method for PRL thickness in HIV-positive individuals and explores its potential as a neuroretinal health marker, including the role of inflammation in retinal changes.

Methods

This cross-sectional study included 61 immunocompetent HIV-positive adults, with participants on antiretroviral therapy (HIV-ART, 62 eyes), not on ART (HIV-N-ART, 20 eyes), and HIV-negative controls (82 eyes). Using Spectralis SD-OCT, the PRL was manually segmented using our novel method across four regions: inner nuclear layer to retinal pigment epithelium (INL-RPE), INL to external limiting membrane (INL-ELM), ELM to inner segment-outer segment junction (ELM-ISOS), and ISOS to retinal pigment epithelium (ISOS-RPE). Group differences in thickness were analyzed using ANOVA.

Results

In the central 1mm (C1) region, INL-RPE thickness was higher in the HIV-N-ART group ($250.05 \pm 48.77 \mu\text{m}$) than both the HIV-ART ($231.90 \pm 23.29 \mu\text{m}$) and control ($235.39 \pm 22.16 \mu\text{m}$) groups ($p = 0.037$). Additional differences in INL-ELM (S6, $p = 0.012$) and ISOS-RPE (C1, $p < 0.001$) thicknesses further highlighted group-specific structural variations. A positive correlation between PRL thickness and CD4 count in specific regions was observed in the HIV-ART group.

Conclusions

These PRL alterations may indicate an impact on the outer retina barrier, possibly influenced by inflammation. This mechanism has not been explored as a factor in retinal changes among HIV-positive individuals, presenting a new perspective on retinal health in this population. PRL segmentation via SD-OCT reveals subtle changes linked to HIV and ART, supporting its utility as a neuroretinal health indicator. The structural differences in the HIV-N-ART group suggest retinal stress, warranting further longitudinal studies.

Poster Presentation #11 (PP11)

Parkinson's disease and stereopsis

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Topic

Clinical/Medical

Abstract

Purpose

To compare stereopsis between a group of patients with Parkinson's disease (PG) and a control group (CG), and to assess how stereopsis changes as the disease progresses, as measured by the Hoehn and Yahr scale.

Methods

Age-matched healthy controls (n=97) and Parkinson's disease (PD) patients (n=71) underwent medical history evaluations and visual assessments. Stereopsis was measured using the best near correction with the Stereo Fly Test (Stereo Optical Company, Inc.), specifically with the Wirth points test (9 circles ranging from 800" to 40"). The PD patients were inpatients at the Hospital Arnau de Vilanova-Llíria and the Asociación Parkinson Valencia, while the CG consisted of students from the La Nau Gran program for retired individuals at the University of Valencia. Statistical analyses were conducted to compare stereopsis across the Hoehn and Yahr stages between the CG and PG groups. Lineal regression was used to evaluate how stereopsis changed with advancing PD stages.

Results

Significant differences in stereopsis were found between the CG and PG groups at all stages of the Hoehn and Yahr scale: Stage I (U = 2.71; p = 0.01), Stage II (U = 3.97; p <=0.01), Stage III (U = 2.81; p = 0.01), and overall (U = 2.94; p = 0.01). The analysis of variance (ANOVA) for the regression model indicated that the model was significant (F(1, 167) = 4.75, p = 0.03), suggesting that the progression of Parkinson's disease significantly affects stereopsis in PD patients.

Conclusions

This study found that stereopsis is significantly impaired in patients with PD compared to healthy controls, with a progressive decline as the disease advances. These findings highlight the importance of early detection and monitoring of visual dysfunction, particularly stereopsis, as part of the broader clinical assessment of disease progression in PD.

Poster Presentation #12 (PP12)

Anatomical characteristics that predispose to corneal edema after cataract surgery

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Topic

Clinical

Abstract

Purpose

To assess if exist any anatomical characteristics that may predispose to corneal edema after cataract surgery.

Methods

92 Healthy cataract patients were evaluated. Their cataract was classified according to LOCSIII classification. We measured optical compensation, biometry with an IOL Master 700 biometer (Carl Zeiss Meditec, Jena, Germany), and endothelial cell density with a Topcon SP-2000P specular microscopy (Topcon American Corp, Paramus, NJ) in one random eye. All patients underwent the same cataract surgery by experienced surgeons. After cataract surgery, an expert ophthalmologist determined if patient suffered corneal edema with a slit-lamp examination and visual acuity measurement (presenting visual acuity equal to or worse than before cataract surgery). We analysed prior surgery age, gender, optical compensation, endothelial cell density, anterior chamber depth, corneal thickness, axial length and surgeon of each patient.

Results

After surgery, 33 patients presented corneal edema and 59 did not. Edema sample showed statistical older age (77+7 years old) than non-edema sample (73+ years old, $p=0.03$), and a narrower anterior chamber depth (2.9+0.3 mm for edema sample and 3.2+0.4 mm for non-edema sample, $p=0.004$). Not significant differences were found in the other parameters analysed, although a great nuclear cataract grade in edema patients showed a p value of 0.05. Regarding surgeons, we did not find any correlation between a concreted surgeon with a more corneal edema incidence in their patients.

Conclusions

In healthy patients, narrower anterior chamber depth and older age in patients that underwent cataract surgery may increase the risk of corneal edema. More studies are necessary to investigate the possible incidence of the kind of cataract on corneal edema.

Poster Presentation #13 (PP13)

How to treat blepharitis?

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Topic

Clinical

Abstract

Blepharitis is an inflammatory condition of the eyelid margin; it is one of the first common cause of ocular discomfort. This case report will analyze the cases of two patients who came to the clinic because they complained about eye discomfort.

The first patient complains about itching and red eyes. The slit lamp analysis revealed ocular and periocular area very red and inflamed. It was anterior blepharitis as the eyelids were a little sticky with residues, the eyelid edge was thickened and eyelashes loss in non-homogeneous directions were noted. The patient was given treatment consisting of two specific products for blepharitis: sterile gauze and foam.

The second patient came to the clinic complaining about inflamed eyes secretions. He used contact lenses but had to stop because he had become intolerant. From the slit lamp examination, it is noted that the ocular area and the skin around the eyes is not particularly red or thickened but a very marked redness is immediately evident inside the eyelids associated with the obstruction of the Meibomian glands. The patient was prescribed the same treatment used for the previous patient with the same duration: sterile gauze and foam, with daily cleaning two times per day during a month and a follow-up.

This case report aims to highlight the importance of ocular hygiene for all patients. Recognizing blepharitis is very simple as it is found through a simple routine examination of the eyelids and eyelashes with the slit lamp.

Poster Presentation #14 (PP14)

Simulens your ortho-k fitting

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Topic

Clinical

Abstract

Some orthok fitting systems require the use of trial fitting set for the initial parameter selection. An empirical approach is available from some companies, but independent software is also available to calculate the definitive lens for the patient.

This poster presents three fitting of orthok made by an online fitting software after the failure of trial set lens.

First case shows that for the right eye it wasn't chosen the lens recommended by software, as done with the left eye. After a week, the patient sees well and has no complaints, but there was a hint of smiley face in the topography, so it was decided to order the lens recommended by software also for right eye. The left eye has never presented any problems.

The second case represents a 16-year-old Caucasian boy with progressive myopia. It was fundamental work with this software because it was possible to fit a customized base radius not available in the trial set.

Last case report is a refitting of lenses decentralized downwards. The patient was refitted with a toricity and a base radius MTO, not available in the trial set.

The purpose of this poster is to highlight the importance of using fitting software to improve fitting procedure. This software allows to choose the best lens for each wearer, reducing times and limiting lens changes. This software however leaves fitters free to make changes to the calculated lens and highlights the importance of good topography and refraction as the calculation is based on this data.

Poster Presentation #15 (PP15)

Clinical interprofessional training ward in eye care contributes to innovative eye care for life

Authors

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Topic

Education

Abstract

Content

The organization of the future healthcare system, focusing on personalized medicine and precision medicine, will require multidisciplinary collaborations. Medical students need practice in multidisciplinary teamwork and be given the opportunity to meet clinical supervisors from different professions offering diverse perspectives.

Methods

To create an interprofessional clinical training ward, the Optometry education at Karolinska Institutet (KI) set up a joint arena in collaboration with St. Erik Eye Hospital. The initial idea was based on the concept of giving students the opportunity to learn among peers, studying for other professions, and get clinical supervision and guidance from supervisors with different professions and areas of expertise. Clinicians and students in optometry, eye-nursing, medicine, orthoptics, residents in ophthalmology and specialized ophthalmologists were involved.

Results

The multidisciplinary collaboration has improved production. A team consisting of one ophthalmologist, two residents and five supervisors, educates 48 students and produce 100 visits per day – representing a significant increase compared to the standard number of scheduled visits (close to 100% increase). Students appreciate collaboration with other disciplines and exposure to diverse perspectives helps students approach complex medical cases with a more creative and comprehensive mindset. Clinical supervisors experience personal and professional development and residents in ophthalmology, reports feeling more secure when training under conditions focusing on learning. The project was recently awarded the KLOK-prize (KLOK stands for Clinical learning through Organization and Competency development) and the training ward has been recognized as one of Europe's most modern optometry setting by European Council of Optometry.

Recommendations / Conclusions

The interprofessional clinical training ward encourages collaboration and fosters strong professional networks among students. Bringing such a mindset into their careers, will improve future multidisciplinary efforts in healthcare. The patients, receiving comprehensive care from a team of professionals, shows appreciation and feel well taken care of.

Poster Presentation #16 (PP16)

Assessing efficacy of a dual-focus myopia control contact lens for faster and slower progressing eyes

Authors

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Topic

Clinical/Myopia

Abstract

Purpose

Studies reporting cohort mean myopia control efficacy do not capture treatment effects experienced by individuals. The impact of a dual-focus myopia control contact lenses on individual treated eyes was evaluated in a cohort of myopic children monitored for 3 years prior to treatment.

Methods

Axial lengths of young (ages 8-12 at baseline) myopic eyes completing a 6-year clinical trial of MiSight 1 day (omalfilcon A, CooperVision Inc) were measured annually with optical biometry. The initial single vision control group was switched to the dual focus lens at 36 months (n=90 eyes) who then experienced 3 years of treatment. A published model of expected eye growth in untreated myopic eyes was compared to observed growth during years 4-6. Frequency histograms, cumulative Z-score (Q-Q) plots, bivariate scatter plots and separate examination of the initially faster and slower progressing eyes were used to assess the impact of pre-treatment growth on treatment effect.

Results

Frequency histograms, cumulative Z-score plots, and bivariate scatter plots of pre-treatment vs treated axial growth revealed a sub-group of eyes that did not slow with treatment (10% "non-responders"). Once treatment began, growth of the majority (90%) "responder" eyes slowed to an average 22% of the pre-treatment growth rates. Eyes that on average grew faster or slower during untreated years 1-3 remained the faster and slower groups after treatment was initiated. The treatment effect was largest in the initially faster growing quartile (0.23mm/yr.). Those eyes with slow pre-treatment growth stopped growing once treatment began.

Conclusions

Faster-growing, generally younger eyes treated with a dual-focus myopia control contact lens showed greater absolute slowing than initially slower-growing, older eyes during each of 3 treatment years. 10% of eyes had unchanged growth. These results emphasize that treatment effects are not the same for all myopes.

Poster Presentation #17 (PP17)

Myopic defocus introduced by dual focus myopia control and orthokeratology contact lenses

Authors

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Topic

Clinical

Abstract

Purpose

Dual focus soft contact lenses and orthokeratology (Corneal Refractive Therapy, CRT) treatments have been shown to slow axial length growth. The added plus power within the pupil is affected by annular zone geometry, pupil diameter and decentration of the treatment optic. This paper characterizes the proportion of myopically defocused light delivered to the retina with dual focus contact lenses and after CRT treatment and their effect on image quality.

Methods

Ten young myopic (mean±SD; $-2.44\pm 1.54D$) adults aged 22 to 30 years, (24.5 ± 2.14) were fit with MiSight 1 day (omafilcon A, CooperVision, Inc.; M1d) soft contact lenses and treated for one month with Paragon CRT Dual Axis lenses (paflucocon D, Paragon Vision Sciences, a CooperVision Company) of either 5- or 6-mm optical zone diameters (OZD), randomized to each eye. Foveal aberrations from each eye were measured (Osiris, CSO), from which decentration and refractive state maps of eye plus M1d lens and following CRT lens removal after one day, 1, 2, and 4 weeks of treatment were calculated. Percent of myopically defocused pixels and resulting image quality were calculated.

Results

Average decentrations relative to the pupil center were $0.48\pm 0.33mm$ temporally and $0.40\pm 0.27mm$ inferiorly for M1d lenses and $0.07\pm 0.20mm$ temporally and $0.14\pm 0.21mm$ inferiorly for CRT treated corneas. CRT treatment zone centration was not affected by treatment duration or OZD. Over a 6mm pupil, the average proportion of myopically defocused pupils was 47.3% for eyes wearing M1d and 56.0%, 48.8%, 48.5%, and 45.8% after, respectively, following 1 night, 1 week, 2 weeks, and 4 weeks of CRT treatment.

Conclusions

Despite varying optical designs, both the M1d dual focus lenses and CRT treated corneas introduce approximately 50% of myopically defocused light. Similar image quality was attained with both M1d and following 4 weeks of CRT treatment.

Poster Presentation #18 (PP18)

Efficacy of defocus incorporated multiple segment Lenses in a young Czech population (one year results)

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Topic

Clinical/Myopia

Abstract

Purpose

To evaluate the efficacy of Defocus Incorporated Multiple Segment (DIMS) lenses in slowing myopia progression in a young European population of progressing myopes.

Methods

A prospective, non-randomized, observational study was carried out on 80 progressing myopes aged 6–26 years, with myopia between $-0,25\text{D}$ and $-8,5\text{D}$ and astigmatism $-0,25$ and $-2,25\text{DC}$. Self-selected participants wearing DIMS ($n=55$) or single vision (SV) lenses ($n=25$). Spherical Equivalent Refraction (SER, cycloplegic autorefraction) and axial length (AL) were measured at baseline. AL was measured at 3M, 6M and every 6M and SER measured every 12M.

Results

12M controls are still not finished now, so there are presented partly results. Over 3M was AL changes measured in SV group ($n=19$) for the right eye $0,03\pm 0,09$ mm and the left eye $0,00\pm 0,04$ mm. AXL changes were for this time (3M) statistically non-significant for the right ($p>0,05$) and the left eye ($p>0,05$). The absolute maximum measured difference for the right eye in this group was 0,33 mm and for the left eye 0,09 mm. Over 3M was AL changes measured in DIMS group ($n=54$) for the right eye $0,04\pm 0,08$ mm and left eye $0,03\pm 0,07$ mm. AXL changes were for this time (3M) statistically significant for the right ($p=0,0001$) and the left eye ($p=0,0001$), we reject the null hypothesis that the lengths at the beginning of the measurement and after three months show a difference with a null median. The absolute maximum measured difference for the right eye in this group was 0,40mm for the right eye and 0,17 for the left eye. It follows that there was no change from a statistical point of view in the AXL group and there was a change in the DIMS group in relation to time 0 and 3M.

Conclusions

Daily wear of the DIMS lenses significantly retarded myopia axial elongation in myopic clients.

Poster Presentation #19 (PP19)

Optometrist well-being & attitude towards the profession in Ireland

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Topic

Profession

Abstract

Purpose

As a professional body representing Optometrists in Ireland, insight into the well-being of members is of interest. It is also valuable for the Association to monitor the opinion of Optometrists regarding their attitudes & opinions to the profession and their working conditions.

Methods

A survey was prepared based on the elements of WHO-5 Well-being Index tailored to Optometrists based in Ireland. An online platform for the survey, distributed via the Optometry Ireland newsletter to members. The questions were framed using a Linkert scale. All results were anonymised, however demographic data was captured to allow comparison of results between different cohorts.

Results

17% of those eligible to participate responded with the response rate (n=132). The results show a gender split of 76% female 24% male 0% (non-binary, prefer not to say, other). 36% of respondents identified as practice owners, the rest as employees, locums and academic status. Full analysis will examine differences in responses between employees and practice owners and between those in independent practice. 53% of respondents report working through breaks \ / lunch to complete CPD outside of work hours to remain compliant with legal obligations to practice in Ireland. 28% of respondents reported feeling pressurised by management / senior colleagues in relation to conversion rates. 13% reported bullying and harassment from management or co-workers. 33% agreed that salary fairly reflects the education, training and experience required as well as the pressure / stress of their role with a further 30% neutral on the topic.

Conclusions

The results show a generally positive response from those surveyed. There are a number of questions that highlight areas that Optometry as a profession needs to be aware of to reduce burnout and aid retention of Optometrists in the in the profession.

Poster Presentation #20 (PP20)

Retinal vascular density changes following phacoemulsification versus phacotrabeculectomy for primary angle-closure glaucoma: A comparative study

Authors

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Topic

Clinical/Glaucoma

Abstract

Background

Primary angle-closure glaucoma (PACG) is one of the major causes of visual impairment, especially in regions with a high prevalence. Currently, two main surgical manners deal with PACG: phacoemulsification and phacotrabeculectomy. However, the impact of the two surgical manners on the retinal vascular density has not been well documented. This study aimed to investigate the changes in retinal vascular density and retinal nerve fiber layer thickness after phacoemulsification and phacotrabeculectomy in patients with primary angle-closure glaucoma combined with cataract.

Methods

In the present study, we prospectively enrolled 59 patients with PACG who underwent either phacoemulsification alone (Phaco group, n=29) or phacotrabeculectomy (Combined group, n=30). Retinal vascular density and RNFL thickness were quantified using optical coherence tomography angiography (OCTA), preoperatively as well as one week and one month postoperatively. Key variables included IOP and BCVA.

Results

In the Combined group, significant changes were observed in nasal RNFL thickness (18.02% increase at one month, $p < 0.05$) and inside disc capillary vessel density (6.24% increase at one week, $p < 0.05$). No significant differences in vascular density were found between groups, though the Combined group showed a trend towards greater changes. Both groups exhibited a significant reduction in IOP, with a greater decrease in the Combined group.

Conclusions

Both phacoemulsification and phacotrabeculectomy improve IOP control and BCVA in PACG patients. However, differences in retinal vascular density and RNFL thickness suggest that the two surgeries may have distinct vascular effects, warranting further investigation with larger sample sizes and longer follow-up periods.

Keywords: Phacotrabeculectomy, Phacoemulsification, Primary Angle-closure Glaucoma

Poster Presentation #21 (PP21)

Learning style preferences in an undergraduate optometry programme in South Africa

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Topic

Education

Abstract

Background

Knowledge of learning style preferences is important for decisions related to teaching and learning. Even though data on learning style preferences are available in the literature, limited information is available about these preferences in optometry students in South Africa (SA). Objective. To explore the learning style preferences in an undergraduate optometry programme.

Methods

The study used quantitative research design and online questionnaires for data collection. The Index of Learning Styles questionnaire was used to assess learning style preferences. Data was analysed with descriptive and inferential statistics, where $p \leq 0.05$ was considered statistically significant. Results. Overall, 159 students completed the anonymous questionnaires. Most of the students were black ($n=111$), ≤ 21 years of age ($n=83$) and in their third year of study ($n=53$). The majority of students showed a balanced preference (between 47% and 65% for the different learning style dimensions). There was no significant association between demographic characteristics (gender and level of study) and learning style preferences.

Conclusion

Optometry students have balanced learning styles. This information can be used by stakeholders responsible for optometry education in SA to curriculum review endeavours and decisions related to teaching and learning. This information would be essential to make the educational environment contextually relevant and conducive to student learning.

Poster Presentation #22 (PP22)

Reproducibility and within-subject-variability of HRK-9000A meibography in normal young participants

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Topic

Clinical

Abstract

Purpose

Multi-functional diagnostic devices are becoming more common in optometric practices as they improve practice efficiency, save physical space, cost, and time, and optimize clinical information gathering. Reliability studies are essential for assessing the utility of clinical instruments used in diagnosing diseases like meibomian gland dysfunction. This prospective study evaluated the inter-examiner reproducibility (IER), inter-rater reproducibility (IRR), and within-subject variability (WSV) of the multifunctional HRK-9000A meibographer (Huvitz, South Korea).

Methods

Four consecutive images of the meibomian glands (MGs) of the upper and lower eyelids of the right eyes were captured during the same session by Examiner 1 (E1) and Examiner 2 (E2) in a counter-balanced design. The three best quality images were rated offline by E1, E2 and rater 1 (R1), using the meiboscale system (range: 0-4; where 0 is no loss, 4 is severe loss). WSV was assessed using intraclass correlation coefficients (ICC). Non-parametric Bland-Altman plots, ICC and weighted Kappa (κ) were calculated to determine IER between E1 and E2 and IRR between E1 and R1 as well as E2 and R1.

Results

35 participants (mean age: 22.0 ± 2.5 years, 19-30) were included in the study. The MG grade for the upper (E1: 1.0 ± 0.8 , E2: 1.2 ± 0.8 , R1: 0.9 ± 0.8 , 0.9 ± 0.7) and lower eyelids (E1: 1.9 ± 0.9 , E2: 1.5 ± 1.0 , R1: 2.1 ± 1.1 , 1.8 ± 1.0) were significantly correlated for all comparisons ($p \leq 0.001$). ICCs for repeated measurements of the same participants were all above 0.90 indicating excellent WSV. IRR was moderate (0.43-0.57) with good reliability (ICC range: 0.76-0.86) for the upper eyelids and good (0.60-0.65) with good reliability (ICC range: 0.85-0.88) for the lower eyelids.

Conclusions

The Huvitz HRK-9000A meibographer demonstrated good reproducibility and low WSV, making it suitable for the meibographic assessment and monitoring of MGD progression or treatment.

Poster Presentation #23 (PP23)

Differences in contrast sensitivity between 4–9 year old with and without amblyopia

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Topic

Clinical

Abstract

Purpose

The aim of this preliminary study was to investigate the development of contrast sensitivity in amblyopic children compared to non-amblyopic children.

Methods

Participants were children with amblyopia ($n=36$) and a control group without amblyopia ($n=23$) aged between 4 and 9 years. Monocular achromatic contrast sensitivity was measured in a darkened cabinet with a Topcon CC-100 screen, using sinusoidal stimuli in a circular window with smoothed edges and background luminance 120 cd/m^2 , and spatial frequencies 1.5, 3, 6, 12 and 18 cpd. All participants had best corrected visual acuity. Non-parametric statistics, such as the Mann Whitney test for independent samples, were performed.

Results

The results in log contrast sensitivity (logCS) for two age groups ($A \leq 6$ and $B > 6$ years) were compared. Controls present significant differences between A and B at 3cpd ($U=93.50$; $p=0.028$), 6 cpd ($U=97.00$; $p=0.016$), 12 ($U=99.00$; $p=0.011$) and in the Area Under the Curve (AUC) ($U=103.00$; $p=0.004$), with higher logCS in group B. However, between groups A and B of the amblyopic population significant differences were observed only at 3 cpd ($U=221.00$; $p=0.49$) with a higher mean logCS in the older group.

Conclusions

Changes in the Contrast Sensitivity Function with age in children in the 4–18-year range have been reported in the literature, although there is no agreement about the actual pattern of changes, and it has been suggested by Dekker et al. (2020) that they might be frequency-specific and occur primarily around or below the CSF peak (≤ 4 cpd). Although changes could be due to non-visual factors, changes in neural mechanisms might be responsible for this effect. The different behavior found in the amblyopic and non-amblyopic samples in this preliminary work could support this hypothesis. This, however, should be further explored by enlarging sample size.

Poster Presentation #24 (PP24)

Myopia: A visual problem on the rise. FORTHEM short term mobility for prevention and dissemination to society.

Authors

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Topic

Education

Abstract

FORTHEM is an alliance of nine multidisciplinary public research universities <https://www.forthem-alliance.eu/> This network was created to foster student and staff mobility, as well as cooperation with external actors and student civic activities. This paper presents a Short-Term Mobility activity designed to deepen knowledge about myopia and its associated risks while highlighting its profound impact on society.

Content

Participants worked in groups of 5 to 6 people, focusing on areas related to myopia: prevalence and risk factors, treatments, prevention and ergonomics. Throughout the week-long activity, participants conducted scientific literature searches, shared relevant information from databases, and managed bibliographic references. Finally, students designed informative brochures, and they disseminated the knowledge to the society in Valencia. To evaluate learning and satisfaction, a survey was carried out before and after the activity using a 5-point Likert scale.

Results

A staff of 8 professors and two PhD students were involved. The 23 participants came from 7 countries. The first questionnaire reveals that approximately 50% of participants had knowledge about myopia, risk factors and treatments. However, only 30% knew about control myopia and felt capable of informing the population. In the final questionnaire, the results show that everybody had enough information about myopia, control and its possible solutions and 85% of participants considered they were trained to educate society about the importance of preventing myopia. 100% of those surveyed were satisfied with the activity.

Conclusions

Students learned to search scientific information, elaborate and distribute the brochures to individuals, particularly targeting families with children and teenagers. They empowered individuals to take proactive steps toward safeguarding their vision and well-being. The mobility activity culminated in a highly successful outcome, as participants reported a strong sense of satisfaction through the questionnaires. The communication and fruitful exchange of knowledge among students further enhanced the overall experience.

Poster Presentation #25 (PP25)

Exploring the effect of the Covid-19 lockdown on the clinical and soft skill development of Optometry students in South Africa

Authors

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Topic

Education

Abstract

Background

Optometry is a healthcare profession focused on vision testing and the management of eye conditions. The WHO developed the Eye Care Competency Framework (ECCF) which outlined six key competencies for optometrists in their undergraduate training. The COVID-19 lockdown forced a shift from in-person to online training. There is a paucity of evidence on the impact of this clinical learning approach in as far as the field of optometry.

Purpose

To explore the effect of limited hands-on exposure on clinical and soft skill development in optometry students trained during the Covid-19 lockdown in South Africa.

Methods

A qualitative study was conducted, using a phenomenological approach. Participants were recruited through a purposive sampling technique and through snowball sampling through their employees. Data was collected using one on one indepth interviews, all performed and recorded on the Zoom platform. All interviews were transcribed verbatim, cleaned and stored on the NVivo software, accessible by the researchers. Thereafter, analysis using thematic analysis was conducted, where coding of themes and sub-themes was done by the researchers and an independent and experienced coding person.

Results

A total of 13 employers were interviewed, from various provinces in South Africa. Their employees, aged 22 – 27 years, were predominantly African females who had graduated in the period 2020 to 2022 from three of the four optometry universities offering the degree in the country. Three themes emerged: varied employer perspectives, unsatisfactory clinical skills and impact on soft skills.

Conclusions

Simulated clinical training under the national lockdown in South Africa limited patient exposure to real patients and negatively affected clinical & soft skill development in Optometry undergraduate training in South Africa. If there is a pandemic in the future, and a need for limited movement, academic institutions should find other methods to ensure that clinical teaching is not affected negatively.

Poster Presentation #26 (PP26)

Phacoemulsification, visco-goniosynechialysis and goniotomy in patients with primary angle-closure glaucoma: A comparative study

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Topic

Clinical

Abstract

Objective

The aim of this study was to evaluate the effects of goniotomy on patients with primary angle-closure glaucoma who underwent "phacoemulsification and visco-goniosynechialysis."

Methods

This prospective randomized clinical trial was carried out on 63 eyes of 61 patients (48–85 years) with primary angle-closure glaucoma who were enrolled. The subjects were randomly assigned into two groups. In the first group (32 eyes) and the second group (31 eyes), the patients underwent "phacoemulsification + visco-goniosynechialysis + goniotomy" and "phacoemulsification + visco-goniosynechialysis," respectively. Intraocular pressure and antiglaucoma medication were evaluated (1 week, as well as 1, 3, and 6 months after the surgery). Anterior segment optical coherence tomography parameters (Casia, Tomey, USA) and goniotomy were evaluated preoperatively and 6 months after the surgery.

Results

The mean intraocular pressure lowering the effects in the "phacoemulsification + visco-goniosynechialysis + goniotomy" group was higher than that in the "phacoemulsification + visco-goniosynechialysis" group (6.93 and 4.6, respectively). Furthermore, the difference in intraocular pressure between the two groups was significant at 3 months ($P = 0.014$) and 6 months ($P = 0.021$) after the surgery. There was no difference in anterior segment optical coherence tomography findings before the intervention; however, after the intervention, the anterior segment optical coherence tomography indices were significantly different between the two groups. Moreover, the difference in "phacoemulsification + visco-goniosynechialysis + goniotomy" indices was more than the changes in the "phacoemulsification + visco-goniosynechialysis" group.

Conclusions

The results of this study showed that phacoemulsification + visco-goniosynechialysis + goniotomy is a more effective surgery than phacoemulsification + visco-goniosynechialysis alone in undercounted primary angle-closure glaucoma.

Poster Presentation #27 (PP27)

Application of experimental techniques in physics for the analysis of corneal tissue

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Topic

Clinical

Abstract

Purpose

Biochemical changes within tissue may either initiate disease or occur as the result of the disease process. The qualitative analysis of such changes provides important clues in the search for a specific diagnosis, and the quantitative analysis of biochemical abnormalities is important in measuring of the disease process, designing therapy and evaluating the efficiency of treatment. The objective of this work is to present possible diagnostic applications of experimental physics methods in ophthalmology and to evaluate their future perspectives.

Methods

We conducted a quantitative analysis of healthy and diseased soft tissues using the experimental data obtained by Raman spectroscopy, XRD, SEM and EDS.

Results

We used peak intensity ratio in Raman spectra denoted as C-H stretching modes at 2937cm^{-1} (lipid) and O-H stretching modes at 3392cm^{-1} (water) to differentiate healthy and diseased soft tissue. For diseased tissue this ratio is in our research 0,45 and for healthy is approximately 1. Our work was extended to find the ratio between the protein (2965cm^{-1}) and lipid (2930cm^{-1}) content, as in diseased tissue dehydration is occurring. X-ray diffraction spectra have a sharp peak at $\sim 2^\circ$ (2θ) in diseased tissue which indicates more closely packed molecules with different chemical structure and dehydration.

Conclusions

Monitoring of protein/lipid ratio ($2965/2930\text{cm}^{-1}$) and lipid/water ratio ($2937/3392\text{cm}^{-1}$) in healthy and diseased cornea based on intensity of obtained bands in Raman spectra can be used for noninvasive, in vivo measurements and results in few minutes without need for biopsy.

Poster Presentation #28 (PP28)

Evaluating distance stereoacuity in children 4–17 years of age with a novel digital application

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Topic

Clinical

Abstract

Purpose

Stereopsis is a fundamental skill in human vision and visual actions. There are several ways to test and quantify distance stereoacuity: traditional and new digital applications are both valid ways to test the stereoacuity. The aim of this study is to compare the results obtained using standard tests for distance stereoacuity measurement with the new StereoTAB App.

Methods

A group of 120 children (69 females), aged between 4 and 17 years old (mean age 9.16), were tested using different tests for the quantification of stereopsis at distance. These tests were Distance Randot Stereotest, M&S random dots and the new developed StereoTAB App.

Results

Stereopsis at distance was better with M&S random dots (2.09) than with Distance Randot Stereo test (2.19) or StereoTAB (2.21), but not significantly (Kruskal Wallis, $P=0.117$). A strong correlation was demonstrated between: M&S random dots and Distance Randot Stereotest (0.83, $P \leq 0.0001$), M&S random dots and StereoTAB App (0.84, $P \leq 0.0001$), Distance Randot Stereotest and StereoTAB App (0.88, $P \leq 0.0001$). The limits of agreement (Bland–Altman) between M&S random dots and Distance Randot Stereotest was 0.54, between M&S random dots and StereoTAB App was 0.55, and between Distance Randot Stereotest and StereoTAB App was 0.45.

Conclusions

The distance stereoacuity based on random dots stereopsis showed that the better values were obtained in order by M&S random dots, Distance Randot Stereo test, and StereoTAB. However, the clinical significance of their values is similar, and they can be used interchangeably. The introduction of versatile, fast, and portable stereopsis test which can be used at different distances with children is of primary importance.

Poster Presentation #29 (PP29)

Ways to use image analysis software to evaluate the peripheral fitting of scleral contact lenses

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Topic

Clinical

Abstract

Purpose

The purpose of this pilot study was to evaluate the potential utility of an image analysis software to evaluate the peripheral fitting of a scleral contact lens.

Methods

Twelve eyes with healthy corneas were recruited for the study and a scleral lens design with the possibility to modify the landing zone (SLC Conica, Medlac, Avellino, IT) was used for the measurements. Three lenses with different peripheral design were fitted to obtain an apical clearance of 250 μm with an OAD of 16,80 mm after their settling time. The differences of landing zone behavior were obtained by changing the peripheral angles to control the level of peripheral contact lens bearing \ /compression. The landing behavior of the lenses fitted were acquired in four different sections (Nasal, Temporal, Superior and Inferior) with two-dimensional cross-sectional images obtained with an OCT system (Revo NX, Optopol Technology SA, Zawiercie, PL) and with digital slit lamp images. The slit lamp images were subsequently analyzed using an image analysis software (AOS Anterior, London, UK) using the "bulbar redness" function in different areas of conjunctiva to evaluate possible blanching of the conjunctival vessels induced by compression of landing zone.

Results

From our results we found a very high correlation between the areas ($r = 0.914$) and depth ($r = 0.981$) of compression induced by different peripheral designs as evaluated using the OCT information and the blanching of the conjunctival vessels as evaluated using the image analysis.

Conclusions

In conclusion the objective evaluation of bulbar redness function obtained using an ocular surface and image enhancement software can be an effective support for a better and objective evaluation of the behavior of scleral contact lens periphery on conjunctival tissue without OCT uses.

Poster Presentation #30 (PP30)

Axial length percentiles in portuguese children: Implications for myopia management

Authors

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Topic

Clinical

Abstract

Purpose

The aims of this study are to develop percentile curves of axial length (AL) for Portuguese children and to analyze the patterns of axial length growth.

Methods

Data were collected in schools across Lisbon between September to December 2022 using the Lenstar 900 optical biometer. A descriptive analysis was performed on age, gender and AL percentiles for the average axial length (Average AL) calculated as the mean of right eye (RE) and left eye (LE).

Results

Age-specific and gender-specific AL percentiles (5th, 10th, 25th, 50th, 75th, 90th, and 95th) are presented for 527 children aged 6 to 13 years. No significant differences were found between AL in RE and LE ($p=0.997$). The median AL values [Q1, Q3] were 23.0 [22.5, 23.7] mm. AL percentiles increased with age: at 7 years, [22.4, 22.9] mm; and at 12 years, [22.8, 24.0] mm. Year-to-year changes were more pronounced in myopic children, with significant differences for ages 10 ($p=0.011$), 11 ($p=0.007$), and 12 ($p=0.037$). Gender differences were observed, with males having a slightly higher median AL than females (males: 23.3 [22.7, 23.8] mm, females: 22.8 [22.4, 23.2] mm, $p<0.001$). Non-myopic children exhibited stable AL percentiles compared to myopic children, with median AL significantly greater in myopic eyes (myopic: 24.0 [23.4, 24.9] mm vs. non-myopic: 22.9 [22.4, 23.5] mm, $p<0.001$).

Conclusions

These AL percentiles help in detecting early myopia stages. Monitoring year-to-year changes in AL, especially in myopic children, provides crucial information for managing myopia progression effectively, ultimately improving visual outcomes for children at risk of myopia.

Poster Presentation #31 (PP31)

Short-term changes in retinal activity with four different myopia control ophthalmic lenses

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Topic

Clinical

Abstract

Purpose

This study evaluated electroretinogram (ERG) changes induced by four types of myopia control lenses after 30 minutes and 15 days of wear in young adults with myopia.

Methods

Twenty young myopic adults aged 18 to 30 years with high visual acuity participated. Each subject wore four myopia control lenses with distinct designs of defocus microlenses and power distribution: Aura3 and Aura6 (Fitlens), Myosmart (Hoya), and Stellest (EssilorLuxottica). Visual function and retinal electrophysiological responses were assessed using multifocal global-flash ERG (mf-gfERG), photopic 3.0 ERG, photopic ON-OFF ERG, and pattern ERG (PERG) with RetiScan (Roland Consult). The protocol included three visits: baseline, 30 minutes post-initial wear, and after 15 days. This analysis focused on ON-OFF ERG to evaluate photoreceptor activity (α -wave), ON bipolar channel (b -wave), and OFF bipolar channel (d -wave).

Results

PERG analysis revealed increased N35-P50 and P50-N95 amplitudes after 15 days with Aura3 and Aura6 lenses, with no similar trends in Stellest and Myosmart. Photopic ON-OFF ERG showed an increase in the b -wave with Aura3 and Myosmart lenses, alongside a significant d -wave decrease in both. Photopic 3.0 ERG presented no significant α -wave or b -wave timing changes, but b -wave amplitude increased with Aura3 and Aura6 after 15 days. Additionally, mf-gfERG results indicated no significant trends in central retina responses; however, peripheral retina showed progressive amplitude increases in both wave components (DC and IC) with lens wear.

Conclusions

The findings show a consistent increase in global-flash multifocal ERG peripheral response and a transient increase in PERG amplitudes that may be design dependent. These responses suggest that specific lens designs may induce distinct retinal effects, likely due to their unique defocus characteristics. This protocol demonstrates sensitivity in detecting subtle retinal changes, supporting its use in preclinical evaluation to optimize myopia control lens designs.

Poster Presentation #32 (PP32)

The protective role of green spaces in mitigating myopia prevalence in children and adolescents

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Topic

Clinical

Abstract

Purpose

Myopia is becoming more prevalent worldwide, but its etiopathogenesis is not fully understood. Our study examines the potential protective role of green spaces in reducing myopia prevalence among children and adolescents, based on recent epidemiological studies from various countries.

Methods

The data for this study were collected from the Web of Science and PubMed database between June and July 2024. The initial search query combined keywords: "green spaces" or "rural areas" or "NDVI", and "myopia" or "short-sightedness", yielding 26 publications. We refined these results by manually reviewing titles and abstracts, excluding those not directly related to our research. We further expanded our dataset by reviewing articles that cited our initial findings and those cited by these publications.

Results

The studies consistently used the Normalized Difference Vegetation Index (NDVI) to quantify green space exposure. The analysis reveals a significant inverse relationship between exposure to green space and the risk of developing myopia, across multiple studies. For example, a 0.1 increase in NDVI within various buffer zones around schools was associated with a 6.3–8.7% reduction in myopia prevalence. Higher residential greenness within a 100-meter buffer around homes was linked to a 38% reduction in the risk of developing myopia among preschool children. The protective effect was observed across different age groups, from preschoolers to high school students. Urban planning factors, such as the size, connectivity, and aggregation of green spaces, also influenced myopia risk.

Conclusions

These findings suggest that increasing access to green spaces in urban environments may be an effective strategy for myopia prevention in children and adolescents, with important implications for public health and urban planning policies.

Poster Presentation #33 (PP33)

Six-year cumulative treatment effect of MiSight® 1 day: A dual focus myopia control contact lens

Author

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Topic

Clinical

Abstract

Purpose

Slowed axial elongation of myopic children treated with MiSight® 1 day (MID) was quantified over 6-years using concurrent and virtual control untreated myopic eyes.

Methods

Axial lengths of myopes (mean age 10.5 at baseline) treated with MID for 6 years or switched from control single vision lenses (3 years) to MID (3 years, mean age 13.5) were measured annually (IOL Master). Treatment effects were quantified by the difference in average axial growth of treated eyes over 6 years, growth of study control eyes (3 years), validated models of expected growth of untreated age-matched myopic eyes accounting for 15% (CI 95%, $p < 0.0001$) slowing during each subsequent year as per Shamp, 2022 and expected growth of age-matched emmetropic eyes (Jones, 2005). Efficacy was also quantified by the time delay to reach criterion growth levels created by treatment.

Results

Eyes treated with MID for 6 or 3 years showed slower annual growth than untreated eyes ($p < 0.05$), with cumulative growth differences of 0.52mm and 0.19mm, respectively. Treated eyes grew at rates comparable to age-matched emmetropes, ranging between 112% and 86% of emmetropic growth over 6 years. Untreated eyes' mean growth rates slowed over time, reducing treatment effects in mm but remaining stable as a % of myopic control growth. After 6 years of treatment, average axial elongation (0.48mm \pm 2 SEM) was reached by untreated eyes in 2.1 years, indicating a nearly 4-year growth delay.

Conclusions

Estimated growth of age-matched emmetropic and untreated myopic eyes showed year-on-year slowing, totaling 0.52mm over 6 years. Treated eyes grew similarly to emmetropes, with MID delaying criterion growth by 4 years.

Acknowledgements: Research support provided by CooperVision, Inc.

Poster Presentation #34 (PP34)

Visual function with 4 myopia control ophthalmic lenses

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Topic

Clinical

Abstract

Purpose

This study assessed visual function with four types of myopia control lenses after 30 minutes and 15 days of wear in young myopes.

Methodology

Twenty myopic adults (aged 18-30 years) with high monocular visual acuity were recruited. Participants wore four types of myopia control lenses, each differing in defocus microlens design and power distribution: Aura3 and Aura6 (Fitlens), Myosmart (Hoya) and Stellest (EssilorLuxottica). Evaluations included high (HCVA) and low contrast visual acuity (LCVA), contrast sensitivity function (CSF) under photopic and mesopic conditions, axial length, and central choroid thickness. Light disturbance analysis (LDA) was also performed. Measurements were taken at baseline, after 30 minutes, and after 15 days of lens wear.

Results

Monocular and binocular HCVA improved slightly with all lenses after 30 minutes and 15 days, though changes were not statistically significant ($p > 0.05$). For LCVA, Aura3 and Aura6 showed significant improvements after 15 days ($p \leq 0.05$), while changes with Stellest and Myosmart lenses were less pronounced. CSF remained stable under photopic conditions, with a non-significant mesopic decrease at medium spatial frequencies. LDA showed significant reductions in disturbance indices after 15 days for all lenses, including a 20% reduction in the light disturbance index and nearly 40% in the BFC Irregularity index. Choroidal thickness increased slightly (1-4 μm) after 15 days across all lenses, though changes were not significant, as were axial length measurements.

Conclusions

Reliable measures have been obtained with the subjects wearing their myopia control lenses and all four lenses provided satisfactory visual acuity under high and low contrast sensitivity under photopic conditions. After 15 days, visual acuity showed improvement trends, and light disturbance effects were notably reduced, suggesting that, despite the differences in design, the 4 lenses have similar and favorable effects on visual quality and stability over short-term wear.

Poster Presentation #35 (PP35)

Optometry education in Serbia: New master program

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Topic

Education

Abstract

Purpose

The Faculty of Sciences at the University of Novi Sad has introduced a two-year master's program in Optometry (120 ECTS) to address the growing complexities of modern eye care and bridge gaps in advanced optometric education. This program builds on 17 years of experience delivering a three-year bachelor's program (180 ECTS) and aims to provide specialized clinical training, research opportunities, and access to cutting-edge technologies to prepare graduates for advanced roles in vision care.

Methods

The curriculum, developed in 2023, emphasizes areas crucial for the future of optometry, including: myopia control, vision therapy, clinical optometry, contact lenses, ocular disease management, computer-assisted diagnostic techniques and low vision rehabilitation. Through specialized training students will acquire practical experience with advanced imaging systems, precision diagnostic tools, and personalized vision therapy. The program includes access to state-of-the-art facilities and fosters practical skills through partnerships with university hospitals, private clinics and optical industry leaders, ensuring alignment with the latest trends in vision care.

Results

The program earned full accreditation in spring 2024, following a rigorous evaluation of its curriculum, faculty expertise, and resources. The first cohort of students enrolled in October 2024, signaling the program's readiness to deliver high-quality education and meet professional demands in optometry.

Conclusions

This master's program distinguishes itself by combining advanced clinical education with research-driven innovation and industry collaboration. Graduates will gain the skills needed to lead advancements in clinical practice, contribute to impactful research, and meet the growing demands of modern eye care globally.

Poster Presentation #36 (PP36)

Optometry educators' teaching experiences and opportunities pre-, during, and post-COVID-19 in South Africa

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Topic

Education

Abstract

Purpose

The study investigated the South African optometry educators' teaching experiences and opportunities pre-, during, and post-COVID-19.

Methods

The proposed study design was explorative, prospective, and quantitative. Convenience sampling was used in recruiting participants. Optometry educators from four (4) universities training optometrists in South Africa were invited to participate in the study. An anonymous online questionnaire designed by the researchers was sent to participants to ensure that it captured relevant data. The questionnaire was sent electronically to the participants, and SPSS was used to analyze the collected data.

Results

All participants found that face-to-face (F2F) teaching was the preferred method pre-COVID-19. During the COVID-19 pandemic, the F2F was not the teaching method of choice due to safety measures put in place by the government. Online learning (OL) was preferred by 80% (n=4), and blended methods by 100%, due to flexibility in lecture time allocation and digital device infrastructure. The academics indicated a statistically significant satisfaction before and after the post-COVID-19 pandemic with $p=0.04$ and $p=0.02$, respectively. The dissatisfaction related to online and blended methods of teaching used during the COVID-19 pandemic could be attributed to a lack of preparedness and digital device infrastructure. Beyond the COVID-19 pandemic, participants raised concerns related to the lack of personal interaction and the challenges of self-discipline required for online learning, including face-to-face lectures.

Conclusions

Post the COVID-19 pandemic, there remains a need to address challenges related to the training of optometry educators in using online (OL) and blended methods (BM) of teaching, especially for those with more than 20 years of teaching experience. While OL and BMs are beneficial, F2F teaching should not be neglected as it remains the cornerstone of effective education in optometry, especially in clinical training.

Poster Presentation #37 (PP37)

Evaluation of eye-care service utilization patterns: Development of strategies to improve optometric services in an urban slum (Diep Sloot, South Africa)

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Topic

Research / Vision Science

Abstract

Introduction

People living in the rural and isolated areas of the world are typically of lower socio-economic status and may not always have access to adequate eye care services. In South Africa, there appears to be a lack of information on eye care service utilization of populations living in urban slums in relation to the burden of eye diseases. AIM: This study aimed to evaluate eye-care service utilization patterns and to develop strategies to improve optometric services in the Diep Sloot urban slum (South Africa).

Methods

The study was conducted using a mixed-method approach. The quantitative aspect will entail a cross-sectional study whereby data will be collected at two clinics in Diep Sloot township. The data was captured in the format of questionnaires and eye screening by a trained optometrist. Qualitative data collection was in the form of structured questionnaires and interviews with Optometrists and healthcare facility management involved in providing eyecare services in urban slum communities. The data collected from the study was entered on the Social Sciences (SPSS, version 28 .0.1.0). It was analyzed through inferential and descriptive analyses.

Results and Conclusions

The study will provide beneficial information regarding the prevalence of eye conditions in an urban slum community in the Gauteng province of South Africa and further highlight utilization patterns and uptake of eye care services to populations living in urban slums. This information will serve as a needs-based assessment for eye care providers and policymakers involved in servicing these communities to provide a community-based approach to treatment and management interventions.

Poster Presentation #38 (PP38)

Great north American eclipse 2024 and ocular complications in Quebec (Canada): Results from a population-wide surveillance

Authors

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Topic

Research

Abstract

Purpose

On 8 April 2024, a total solar eclipse was visible to 40 million people in North America, including most of the 8.5 million in the Canadian province of Quebec. The Ministry of health, the Order of optometrists of Quebec and the University of Montreal organized a province-wide surveillance to document the frequency, severity and risk factors of ocular complications. Results of this surveillance are described here.

Methods

The surveillance had three components. First, it monitored the number of eclipse-related calls to Info-santé, a hotline for minor health emergencies. Second, it compared the weekly incidence of emergency room consultations for ocular lesions, to that of the same weeks in previous years. Third, four weeks after the eclipse, a reporting form was made available to the 1400 optometrists throughout Quebec. It collected data on ocular complications symptoms, including behaviour during observation, visual acuity and ocular coherence tomography (OCT).

Results.

The eclipse totality occurred around 15:25, in clear skies. Between 8 – 13 April, Info-santé received 33 eclipse-related calls, including 17 on 8 April. In the following week, the incidence of emergency room consultations for ocular lesions increased to 2.5/100 000 person-weeks, compared to 1.8/100 000 person-weeks in reference years ($p \leq 0.05$). There were 46 reports of ocular complications: 35 solar keratitis and 11 solar retinopathies. Age ranged from 13 – 64, mostly above 18 years. Five cases ($n = 5/46$, 10.8%) had reduced visual acuity, ranging from 6/7.5 to 6/9. Most cases of retinopathy had abnormal OCT ($n = 7/11$, 63.6%). Risk factors included inadequate protection ($n = 22/46$, 47.8%) and false sense of security ($n = 14/46$, 30.4%).

Conclusions

Notwithstanding the large public exposure to this eclipse, its impact on the population eye health in Quebec was limited, with a small number of low-morbidity ocular complications.

Poster Presentation #39 (PP39)

Anterior chamber angle changes in primary angle-closure glaucoma following phacoemulsification versus phacotrabeculectomy: A prospective randomized clinical trial

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Topic

Clinical

Abstract

Purpose

We used anterior segment optical coherence tomography to investigate anterior chamber angles in primary angle-closure glaucoma (PACG) eyes following phacoemulsification and phacotrabeculectomy. Angle widening was significantly greater after phacoemulsification up to 6 months after the surgery. Purpose: To compare anterior chamber angles following 2 common surgeries for PACG.

Methods

One hundred ten glaucoma patients were evaluated in this single center, prospective, randomized clinical trial. Those with concomitant PACG and senile cataract and without a history of ocular surgery, trauma, or chronic miotic use were recruited. Monocular patients were also excluded. Finally, 52 eligible subjects were randomly assigned to phacoemulsification ("Phaco" group, 25 eyes) or phacotrabeculectomy ("Combined" group, 27 eyes) surgeries. A swept-source, anterior segment optical coherence tomography device (CASIA SS-1000 OCT) was used to image the anterior segment. Mask graders used the images to measure the following parameters before and 1 week, 1 month, and 6 months after surgery: angle opening distance at 500 μm , trabecular iris surface area at 500 μm , and trabecular iris angle at 500 μm .

Results

There was no significant difference between study groups regarding best-corrected visual acuity, intraocular pressure (IOP), and the number of glaucoma medications in preoperative or postoperative visits ($P > 0.076$). Also, the measured angle parameters were not statistically significantly different between the 2 groups before surgery ($P > 0.123$). After surgery, all measured parameters were significantly increased in both groups ($P \leq 0.0001$). At the 6-month follow-up, nasal angle opening distance at 500 μm was 0.383 ± 0.027 vs. 0.349 ± 0.017 , trabecular iris surface area at 500 μm was 0.141 ± 0.007 vs. 0.125 ± 0.005 , and trabecular iris angle at 500 μm was 40.1 ± 12.9 vs. 34.6 ± 3.1 in Phaco and Combined groups, respectively ($P \leq 0.0001$ for all).

Conclusions

Anterior chamber angle widening by anterior segment optical coherence tomography was observed in following.

Poster Presentation #40 (PP40)

The improvement of binocular functions through dichoptic training leads to better surgical outcomes in intermittent exotropia

Authors

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Topic

Clinical

Abstract

Intermittent exotropia is the most common but also the most unpredictable form of exotropia in terms of its outcome. Only 50% of children who undergo surgery improve their binocular functions, a fact associated with high recurrence rate and need for reoperation.

Content

Amblyoplay is a short-duration binocular dichoptic exercise program designed to treat amblyopia as well as binocular function disorders with the use of video games. The aim of this prospective study was to investigate the ability of Amblyoplay to strengthen binocular functions in patients who have undergone surgical correction of intermittent exotropia as well as reduce the rate of unsatisfactory surgical outcomes.

Actions taken

Patients aged 5-17 years with intermittent exotropia were included in the study and underwent bilateral lateral rectus recession performed. Patients in the study group (29 participants) had two Amblyoplay training 15-minute sessions per day for 6 months. Visual acuity (logMAR), simultaneous fixation (Red filter test), fusion (Worth 4 Dot test), stereopsis (TNO/Randot test) and strabismus angle (Alternate Prism Cover Test) were recorded pre-operatively, at 3 and 6 months after surgery and compared to the control group (26 participants). Poor postoperative outcomes were considered esotropia $>5\Delta$, exotropia $\geq 10\Delta$ or stereopsis >0.6 log arc sec (distance). Statistical analysis was performed using Stata 15.1. Statistically significant improvement was found in stereopsis ($p=0.012$) and angle of squint ($p=0.029$) at the end of the follow-up period. Unfavourable results were also significantly lower in the study group at the 3- ($p=0.004$) and 6-month time point ($p=0.011$).

Conclusions

This is the first study assessing the effectiveness of Amblyoplay in intermittent exotropia patients. Postoperative exercise with this program significantly improved their stereoscopic vision and reduced the recurrence rates of exotropia and unacceptable surgical outcomes. Binocular diplopic training can therefore be a new therapeutic tool for this condition.

Poster Presentation #41 (PP41)

Proteomic analysis of tear fluid in patients with keratoconus

Authors

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Topic

Research/Science

Abstract

Purpose

The aim of this study was the comparative analysis of tear proteins between controls and keratoconic patients in order to map the tear proteomic profile in keratoconus (KC) and discover possible biomarkers for early diagnosis and individualized therapy of this condition.

Methods

This prospective observational study included 16 KC patients and 16 healthy individuals with a mean age of 42.5 and 41.2 years old respectively (range 18–50 years). Ten μ l of tear fluid were collected from each participant using micropipettes. Proteomic analysis comprised of high-performance liquid chromatography and mass spectrometry using nano-electrospray ionization.

Results

In total, 313 proteins were identified, 31 of which were expressed in both groups. Immunomodulatory and defense proteins were found in both KC patients and controls. A high percentage of structural and metabolic proteins were identified in the samples of KC patients. Three dysregulated protein clusters present only in KC patients included keratins, peptidyl-proline isomerases (PPIases) involved in cellular response to ultraviolet radiation and aldehyde dehydrogenases (ALDHs) which are protectors against oxidative stress.

Conclusions

The tear composition of patients with KC based on proteomic analysis showed remarkable differences compared to healthy individuals and highlighted the importance of inflammation, oxidative damage and cell death processes in the pathophysiology of the disease. The discovery of biological pathways and molecular mechanisms involved in KC is a promising step towards the development of new diagnostic procedures and the discovery of novel therapeutic targets.

WORKSHOPS ABSTRACTS

Workshop #1 (WS1)

Pre-Presbyopia: A new category in vision care and identifying the need for early solutions

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Topic

Vision Care

Abstract

Pre-presbyopia, affecting individuals aged 38–45, has long been an unrecognized phase of vision changes, overshadowed by its more widely acknowledged counterpart, presbyopia. However, the demands of modern lifestyles—dominated by prolonged screen time, reduced natural visual breaks, and increased multitasking—have led to an earlier onset of visual discomfort and functional challenges. This workshop aims to redefine pre-presbyopia as a distinct category within vision care, emphasizing the importance of early identification and tailored solutions.

Participants will explore how evolving work environments, digital device dependency, and shifting daily routines have intensified the strain on visual systems, making early intervention a necessity. Attendees will gain a deeper understanding of pre-presbyopia's impact on quality of life and learn innovative approaches to address these emerging needs, ensuring clearer and more comfortable lives in the critical pre-presbyopic years.

Workshop #2 (WS2)

Pre-Presbyopia: a new category in vision care and identifying the need for early solutions

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Topic

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Workshop #3 (WS3)

Pre-Presbyopia: a new category in vision care and identifying the need for early solutions

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Topic

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Workshop #4 (WS4)

Integrating Miller's pyramid and Harden's ladder for effective assessment and interdisciplinary learning

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Topic

Education

Abstract

This workshop focuses on integrating Miller's Pyramid and Harden's Ladder in assessment design for optometry education. Miller's Pyramid assesses clinical competence from theoretical knowledge to practical application, while Harden's Ladder promotes interdisciplinary learning, ranging from isolated discipline-based education to fully integrated transdisciplinary approaches.

Content

The 90-minute workshop comprises two activities.

In the first activity, participants explore how Miller's Pyramid is applied across various European educational programs. Working in small groups, participants will share how their Institutions use different levels of the pyramid— such as "Knows", "Knows How", "Shows How" and "Does"— to develop students' clinical competence.

In the second activity, participants examine Harden's Ladder as a framework for promoting interdisciplinary learning. Through group work, they will identify assessments that support a progressive shift from discipline-specific to transdisciplinary learning, identifying strategies to foster integrated learning and skill development.

Results

The activities will seek ways of implementing Miller's Pyramid in clinical education across European programs, highlighting innovative practices in using assessments to support student competence development. Participants will gain insights into the practical challenges and successes of applying each level of Miller's framework. Similarly, group work on Harden's Ladder will help participants understand how structured, progressive integration supports student-centered, collaborative learning.

Conclusions

Integrating Miller's Pyramid and Harden's Ladder in assessment design creates a comprehensive approach that aligns educational practices with real-world competencies and interdisciplinary collaboration. The workshop will demonstrate the value of these frameworks in supporting both clinical and interdisciplinary skill development. Participants will leave with practical insights and strategies for implementing authentic, relevant assessments in their educational contexts, fostering a deeper understanding of how to bridge theoretical knowledge and interdisciplinary application in optometric education.

Workshop #5 (WS5)

Innovative approaches to myopia management: A practical workshop

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Clinical

Abstract

This interactive 90-minute workshop on myopia management aligns with the conference theme, “Innovative Eye Care for Life” by equipping eye care professionals with evidence-based strategies for managing the growing prevalence of myopia.

As the myopic population is projected to reach 3.36 billion by 2030, myopia management has shifted from simple refractive correction to a comprehensive approach aimed at slowing disease progression and mitigating associated risks, such as myopic maculopathy and retinal detachment.

Through case studies and practical demonstrations, this workshop will delve into critical decision-making points in myopia management, including ‘when to initiate treatment’, ‘how to monitor and assess treatment efficacy’, and ‘when to consider stopping interventions’.

Using a data-driven approach, we will explore the latest advancements in myopia control options, including specialized spectacle lenses, multifocal contact lenses, orthokeratology, and pharmacological interventions like low-dose atropine. The workshop will also provide insights into the environmental and behavioural risk factors associated with myopia, such as outdoor activity and near-work habits, offering practical recommendations for integrating lifestyle modifications alongside clinical interventions.

Attendees will be introduced to the Myopia Management Navigator, an interactive tool designed to guide evidence-based decision-making. Live polls and participant feedback will be incorporated throughout the session, fostering a collaborative learning environment.

By the end of the workshop, participants will gain a deeper understanding of a holistic approach to myopia management, incorporating both clinical and lifestyle strategies to provide patients with lifelong eye health and vision stability.

This workshop is ideal for new and more experienced practitioners seeking to enhance myopia management skills and adopt an innovative, patient-centred approach to long-term eye care.

Workshop #6 (WS6)

Analysis of clinical cases for optometrists

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Topic

Clinical/Educational

Abstract

“Analysis of Clinical Cases for Optometrists” is an interactive seminar that provides optometrists with the opportunity to learn from various clinical cases encountered in practice.

Due to the demands of daily work, optometrists often lack the chance to share interesting cases that could foster information exchange with other specialists. This seminar aims to enhance the efficiency of analyzing patient complaints and developing solutions based on globally accepted guidelines.

The seminar will include theoretical instruction on how to create clinical cases (30 min), presentation of various clinical cases commonly seen in optical practices and exercises to strengthen optometrists' logical thinking by analyzing different types of cases independently (1 hour). A total of 10 complex clinical cases that any optometrist may encounter in daily practice will be covered.

Seminar objectives and tasks

Develop optometrists' logical thinking skills through analysis of complex clinical cases encountered in practice. Create a structured approach to patient analysis based on industry guidelines. Foster professional fellowship, encourage learning from one another and facilitate experience-sharing among optometrists.

ABOUT THE ACADEMY

THE EUROPEAN ACADEMY OF OPTOMETRY AND OPTICS (E.A.O.O.)

The Academy was launched in Lausanne, Switzerland in May 2009, at the Spring Meeting of the European Council of Optometry and Optics (ECOO). The Secretariat is hosted by the College of Optometrists, London, United Kingdom. Our mission is to facilitate the changing face of optometry and optics in Europe by engaging, educating, inspiring and motivating our educators, students, researchers and practitioners to achieve the highest level of practice.

EAOO Member benefits:

- **Networking:** Connect with a diverse network of professionals across Europe and beyond, including industry leaders, practitioners, and educators. Special Interest Groups (SIGs) offer a unique opportunity to collaborate on specific topics of interest.
- **Professional development:** Attend our renowned annual conference, a must-attend event in the optometry and optics calendar, offering valuable learning, networking, and social opportunities. Members enjoy discounted rates for conference tickets. Additionally, the prestigious Academy Fellowship (FEAOO) recognizes members who have made significant contributions to the field of optometry or optics.
- **Professional Recognition:** As an EAOO member, you demonstrate your commitment to continuous professional development. Membership and Fellowship distinguish you as a respected professional, with the option to proudly display the EAOO member logo, signaling your support for the advancement of optometry and optics.
- **Exclusive Resources:** Access a wealth of resources through our members-only website, including a directory, SIG forums, and the "Ask the Expert" page. Our online resource hub provides on-demand access to conference sessions, ensuring continuous learning year-round.

How to join? Membership of the Academy is available to individuals, students and organizations. Become an Academy member by visiting our website at [www.eaoo.online/membership/become-a-member!](http://www.eaoo.online/membership/become-a-member)

