



Poster Presentations

*118th Annual AOA Congress & 45th Annual
AOSA Conference: Optometry's Meeting®*

June 24-28, 2015

Poster Presentations

Optometry's Meeting® • Seattle, Washington • June 24-28, 2015

“TOP FIVE” POSTERS

The top five posters were selected by the Poster Committee to participate in an interactive education session at 2015 Optometry's Meeting®: Course #3015 “Current Research You Should Incorporate into Your Mode of Practice Now!” Saturday, June 27, 2015, from 8 a.m. to 10 a.m.

These top five posters are indicated in orange text throughout the document and include:

POSTER 1: Validation Study of New LCD-Based Contrast Sensitivity Testing Method

POSTER 2: Is Binocular Balancing with Subjective Refraction a Thing of the Past?

POSTER 27: Non-Arteritic Anterior Ischemic Optic Neuropathy in a Young African American Male

POSTER 34: Bilateral Cystoid Macular Edema in Retinitis Pigmentosa and Its Management

POSTER 48: Optic Nerve Head Drusen: A Myriad of Presentations

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Posters are peer-reviewed and only those that meet the acceptance criteria are selected for presentation.

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POSTER 1

Validation Study of New LCD-Based Contrast Sensitivity Testing Method

Sarah Henderson, BHS

**Additional Author(s): Jeung H Kim, PhD, OD
Paul Harris, OD**

Contrast sensitivity (CS) measurements are valuable in assessing aspects of ocular conditions which go well beyond standard measures such as visual acuity. A new test, the Harris Contrast test (M&S Smart System®), which is a computer based test displaying on an LCD monitor, allows the tester to manipulate the contrast level with different optotype sizes. This test could become an adjunct to the traditional methods which are part of routine eye and vision care.

Data from 53 healthy adults aged 23 to 65 (mean 29 +/- 10.5 years) with best corrected visual acuity (BCVA) of 20/20 or better and absence of systemic and/or ocular conditions that can potentially result in CS reduction were examined under binocular conditions for this study. The high-contrast Bailey-Lovie chart was used to measure initial BCVA. Visual acuity (VA) thresholds from the low-contrast Bailey-Lovie chart were obtained and compared with ones from the Harris test set at the constant 18% Weber contrast level. Contrast thresholds, which were compared against varying acuities, were measured using 20/400, 20/200, 20/100, 20/50, 20/40 and 20/30 Sloan optotypes on the Harris chart.

Mean VA from the low-contrast Baily-Lovie chart was logMAR of -0.006 (+/- 0.11), while the Harris contrast equivalent was logMAR of -0.0038 (+/-0.09), showing no statistically significant difference ($p=0.455$) between the two testing methods. CS levels were measured at a series of optotype sizes from 20/400 to

20/30. The mean contrast thresholds followed the expected pattern of changes at different spatial frequencies. From 20/400 to 20/100 (low spatial frequency), the logCS was around 1.65 and as the spatial frequency increased the logCS decreased: 1.45 (20/50), 1.35 (20/40), and 1.20 (20/30). These last three values were statistically significantly different from each other ($p<0.001$) and from the low spatial frequency baseline ($p<0.001$)

POSTER 2

Is Binocular Balancing with Subjective Refraction a Thing of the Past?

David Geffen, OD

Additional Author(s): Mile Brujic, OD

Binocular balancing is the step in subjective refractions that involves matching the accommodative stimulus for the two eyes. It also relaxes the accommodation as a result of both eyes being open and enables the matching of the visual acuity between two eyes. Binocular balancing is required because there is a risk of over-minusing a patient during a subjective refraction when using a phoropter and Snellen letters. However, this procedure can be confusing or even stressful to patients, and may not be possible in patients with differing visual acuities in the two eyes. Moreover, binocular balancing can be technically challenging for optometric staff and technicians, making the delegation of a subjective refraction difficult. A device that utilizes point spread function (PSF) for the subjective refraction (PSF Refractor, VMax Vision, Maitland, FL) instead of Snellen letters provides the opportunity to obtain an accurate refraction without the need for binocular balancing. Our center participated in a clinical study comparing the performance of this technology with that of a traditional

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phoropter.

The assessments were conducted in the right eyes of 30 patients who presented for a routine visual examination. Each patient underwent a subjective refraction first with a standard phoropter with binocular refraction using +1.0 D fogging in the fellow eye, and binocular balancing at the end. In the same patient and the same eye, monocular refraction was performed with a PSF Refractor and without binocular balancing. The manifest refraction and visual acuity (VA) were recorded.

The mean age of the patients was 37.3 years (range 10–68 years). In 70% of patients, the spherical equivalent (SE) with the PSF Refractor was within 0.13 D of that with a binocularly balanced phoropter. In 27% and 3% of patients, respectively, the SE differed by more than 0.13 D and 0.255 D. Point spread function refraction results were equal to or better than those obtained with the phoropter binocular method in 93.5% of patients.

POSTER 3

Visual Performance of In-Office Neutral Grey tinted Contact Lenses in Sunlight

Fraser C. Horn, OD

Additional Author(s): Matthew Lampa, OD

Graham Erickson, OD

Chad Rosen, OD

Nathan Langemo, OD

Athletes utilize tinted contact lenses (CLs) in sport as they report improved visual performance. One study has shown benefits of a commercially tinted CLs with low contrast visual performance. Since this lens is no longer in production, the authors set out to investigate if subjects have better low-contrast visual performance with an in-office neutral grey tinted CLs compared to clear CLs.

Thirteen subjects (2 females, 11 males) were fit with Coopervision Frequency 55 CLs in a clear and ~50% visible light transmission grey tint. Tinting was performed with an in-office Softchrome system. After assessing for binocular visual acuity (VA) of 20/25 and an acceptable fit, the subjects were led outside for testing. Each subject completed testing at a 4 meter distance with the sun at their back to maximize illuminance on the test set-up. Subjects wore welding goggles before testing and between stations to decrease adaptation to the sunlight. Each subject completed the following visual tasks: time to first letter (time to identify a 10% contrast 20/25 letter); absolute threshold (maximum VA); alternating between bright and shaded targets at 20/80 and 20/25 VA level (cycles per minute); near - far rock at 20/80 and 20/25 VA levels (cycles per minute); and a subjective questionnaire. The sequence of testing was repeated for the clear and tinted lens modality.

Due to the small number of subjects, no visual performance results were significant. We did see trends that in-office tinted CLs had improved visual performance, especially with time to first letter, absolute VA threshold, and alternative fixation (20/25). When asked about performance of the CLs relative to different aspects of the bright sunlight, subjects generally reported improved performance with the tinted CLs.

POSTER 4

Effects of Disposable Contact Lenses on Quality of Vision

Eric Brooker, OD

Disposable contact lenses normally do not provide the quality of vision obtained through prescription optical lenses, but there has never been an instrument capable of objectively,

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measuring, quantifying, and demonstrating the loss of visual quality experienced in soft contact lenses versus glasses. The AcuTarget HD (Visiometrics, Spain) has the ability to objectively assess a patient's quality vision through both glasses and contact lenses. The AcuTarget HD utilizes a double pass technique to objectively measure forward light scatter, which often reduces quality of vision, acuity, and contrast.

Ten subjects were measured on the AcuTarget HD utilizing the double pass method wearing their spectacle best corrected manifest refraction to obtain a baseline Objective Scatter Score (OSS) and Predicted Visual Acuity (PVA). These subjects were then measured wearing two name brand daily disposable contact lenses at 5 mins, 1 hour, 4 hour and 8 hour intervals to assess OSS and PVA.

The average OSS and PVA scores were clinically significantly better for the subjects wearing spectacle lenses versus both brands of contact lenses at all-time points.

POSTER 5

Scleral Lens Success in a Patient with Limbal Stem Cell Deficiency

Jeanette L. Strommen, OD

JL, a 54 y/o male complains of red, irritated and photosensitive eyes off and on for the last two years. He has a history of soft contact lens use for forty years, which he discontinued eight months ago because of blurred vision and discomfort despite several trials. His current ocular medications include Alex BID OU, Restasis BID OU and Artificial tears 6-8 times per day OU.

His entering visual acuities were 20/70 and 20/40 in the right and left eyes respectively; there was no improvement on pinhole. Refraction improved acuities to 20/40 OD and

20/30 OS. Slit lamp examination revealed 1+ conjunctival injection OU, corneal epithelial irregularity lines throughout the corneas OU and whorled SPK throughout the corneas and extending into the superior limbus OU. He was diagnosed with Partial Limbal Stem Cell Deficiency secondary to Contact Lens use OU. Treatment included topical FML BID OU and punctal plug insertion to all four puncta; all other ocular medications were discontinued. After six days of treatment, the patient noted an improvement in comfort and corrected visual acuities increased to 20/25 OD and 20/20 OS. Corneal involvement had markedly improved with the epitheliopathy line regressing out of the visual axis in both eyes. He continued treatment for one month prior to initiating scleral lens wear. He was fit with Europa Scleral Lenses OU: 43.00D BC/16.00mm Diameter /-5.25 sphere OD and 43.00D BC/16.00mm Diameter /-6.00 sphere OS. After one month, his corneal signs had significantly regressed; he was able to see 20/20 OU and able to comfortably wear the lenses all day.

Limbal Stem Cell Deficiency can be a frustrating and complicated condition. Topical steroid use may reverse the corneal damage and permit the Limbal stem cells to function properly. Scleral lenses provide a moisture chamber to permit the cornea to heal as well as provide a safe contact lens modality for patients with high refractive errors.

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POSTER 6

Interest and Acceptance of a New Contact Lens Technology in Today's Practice

Marjorie J. Rah, OD, PhD

**Additional Author(s): William Reindel, OD
Gary Mosehauer**

With increased concentration associated with visual tasks on digital devices, blink rates decrease. This may lead to increased lens dehydration and symptoms of dryness, discomfort and blurred vision. A new contact lens technology has been designed to resist dehydration and discomfort that may be caused by reduced blink rates. The purpose of this evaluation was to evaluate patient interest in new technology and acceptance of a new monthly replacement silicone hydrogel contact lens/lens material, samfilcon A.

A total of 151 eye care professionals (ECPs) were asked to prescribe samfilcon A contact lenses to patients. After wearing the lenses for up to 30 days, patients were instructed to complete an Internet survey to assess interest in new contact lens technology and satisfaction. A two-sided asymptotic binomial test was used to test the null hypothesis that the proportion of agreeing responses was equal to the proportion of disagreeing responses.

A total of 501 patients used samfilcon A contact lenses for 7 or more days prior to completing the survey. The average number of hours per day spent using digital devices was 7.3 hours, and 97% of patients wore their lenses 8 or more hours per day. Patient interest in trying new technology was 96.6%; however, most patients (75.6%) only expected to obtain an update to their prescription during their office visit. Following samfilcon A lens use, 92.2% of patients agreed the lenses helped relieve their eyes from feeling dry and tired

after a long day of looking at digital devices ($p < 0.01$), 94.6% agreed the lenses provided exceptional clarity and comfort ($p < 0.01$), and 90% preferred the lenses overall compared to their previous lenses ($p < 0.01$).

POSTER 7

New Peroxide Lens Care System Demonstrates Sustained Lens Wettability, Biocidal Efficacy and Low Residual Peroxide after Neutralization

Jessie Lemp, DrPH

Additional Author(s): Leroy Muya

Manal Gabriel

Tim Gibson

Huagang Chen

Three separate studies were conducted to evaluate Clear Care® Plus (CCP), a new hydrogen peroxide (H₂O₂) contact lens care product with a custom wetting agent, EOBO-21-polyoxyethylene-polyoxybutylene, for sustained wettability, biocidal efficacy and residual H₂O₂ after neutralization.

Three silicone hydrogel (SiHy) contact lens types were evaluated for sustained wettability following use of CCP or 4 commercially available H₂O₂ systems via the sessile drop technique (VCA Optima system – n=8 lenses/treatment, 2 measurements/lens). Contact angle measurements were obtained after 0x, 3x, 5x and 10x saline/air exposure cycles to capture changes in contact angle over time. The Stand-alone Test was used to evaluate the antimicrobial activity of the CCP system against bacteria, yeast and mold at 6 hours disinfection time in the presence of organic soil. For residual H₂O₂, five AOCups/AODiscs per H₂O₂ system (Clear Care® and CCP) were tested through 100 cycles. Residual H₂O₂ of the neutralized solution was measured via UV

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spectroscopy in parts per million (ppm) after 1, 15, 30, 45, 60, 75, 90 and 100 cycles at 6 hour neutralization.

All SiHy lenses treated in CCP were associated with a significantly lower contact angle compared to lenses treated in all 4 commercially available H₂O₂ products following multiple saline/air exposure cycling conditions ($p < 0.01$). At 6 hours disinfection time in CCP, the average log reduction, with organic soil, ranged from 4.9 -5.0 log cfu for *S. aureus*, *P. aeruginosa* and *S. marcescens*. The average log reduction was 3.0 \pm 0.3 log cfu for *F. solani*, and 4.8 \pm 0.1 log cfu for *C. albicans*. The mean residual H₂O₂ for both the Clear Care® and the new CCP was below 5ppm after 100 cycles.

POSTER 8

Role of Prosthetic Replacement of the Ocular Surface Ecosystem (PROSE) in Treatment of Persistent Corneal Epithelial Defect

Rutvi Doshi, OD

Neurotrophic keratopathy (NK) is a rare corneal disease caused by impairment of trigeminal nerve innervation leading to persistent corneal epithelial breakdown and poor healing. This breakdown can eventually lead to corneal ulceration, melting, and even perforation. Corneal epithelial compromise in NK results in decrease or absence of corneal sensation in all cases. Careful monitoring of NK patients is essential and treatment varies from pharmacological to various surgical techniques with the end goal of promoting corneal healing. Our case describes successful use of BostonSight PROSE device to heal persistent epithelial defect in a patient with longstanding neurotrophic keratitis.

25 year old male presents with a history of

longstanding persistent epithelial defect secondary to neurotrophic keratitis in the right eye. His medical history is also significant for insulin-dependent diabetic mellitus for seventeen years. His ocular history is significant meesman's dystrophy, multiple retinal detachments with surgical repairs, and persistent epithelial defect previously treated with surgical intervention including amniotic membrane transplantation, conjunctival flap, and a full tarsorrhaphy. The full tarsorrhaphy of his right eye successfully healed the longstanding epithelial defect, but was removed due to patient discomfort after six weeks. A bandage soft contact lens was then placed for continuous wear to prevent risk of microbial keratitis, but no healing took place with this regimen after seven months. With prior history of complete healing, patient was referred to our office for BostonSight PROSE device. This fluid-ventilated gas permeable device covers the cornea and immerses the ocular surface in artificial tears. This expanded tear reservoir provides constant lubrication and reestablishes a healthy and stable ocular surface environment that supports healing. With continuous wear of PROSE device over 5 week period, our patient's cornea did not have any further complications and the persistent epithelial defect completely.

Management of neurotrophic keratopathy with vision-threatening risks can be challenging and BostonSight PROSE device can be used to promote corneal epithelial defect healing and prevent stromalysis.

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POSTER 9

Improved Comfort and Lid Wiper Epitheliopathy in Contact Lens Wearers with Use of a Dual-polymer Eye Drop

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Additional Author(s): Christopher Lievens, OD
Jason Nichols, OD, PhD
Joseph Vehige, OD
Haixia Liu, PhD

Rewetting drops are used in contact lens wear to relieve symptoms of discomfort. This study compared the efficacy and safety of a new rewetting drop formula containing both sodium carboxymethylcellulose and hyaluronic acid (CMC-HA) with a standard drop containing sodium carboxymethylcellulose only (CMC) in a large population of contact lens wearers.

365 adapted daily-wear lens wearers currently using hydrogel, silicone hydrogel, or rigid gas permeable lenses were enrolled in this prospective, randomized, masked, clinical trial conducted at 15 clinical sites in the United States. All subjects provided their consent in accordance with the tenets of the Declaration of Helsinki and other applicable local regulations. Subjects used their assigned rewetting drop 1-2 drops per eye, at least 4 times per day for 90 days, along with their habitual lens care system. At baseline and at days 7, 30, 60 and 90, contact lens distance visual acuity (CLDVA), subject questionnaires, conjunctival staining, and lid wiper epitheliopathy (LWE) were assessed, along with standard safety variables.

At day 90, formula CMC-HA performed better than CMC in regards to various symptoms including dryness throughout the day ($p=0.006$), burning/stinging ($p=0.021$), and end-of-day burning/stinging ($p<0.001$). CMC-HA also performed directionally better for end-of-day

dryness ($p=0.055$). LWE staining was improved in the CMC-HA group at day 90, while it increased slightly in the CMC group, with a significant between-group difference ($p=0.009$), and CMC-HA demonstrated directionally greater improvement in bulbar conjunctival staining at day 90 ($p=0.08$). CLDVA and standard safety variables (biomicroscopy, adverse event rates) were similar and acceptable in both groups.

POSTER 10

Use of a Scleral Lens to Maintain Ocular Surface Integrity Following Orbital Radiation

Muriel Schornack, OD
Additional Author(s): Cherie Nau, OD

Treatment options for malignant lesions in the eye may include gamma knife radiosurgery or other types of radiation. Collateral damage from this therapy may result in severe keratopathy. Aggressive measures to maintain ocular surface integrity may help to maintain vision and ocular comfort in patients who must undergo this therapy.

An 83 year old Caucasian male was referred for evaluation of a pigmented iris lesion in the right eye. Best corrected visual acuities of 20/30 OD, 20/400 OS were recorded a presentation. His medical history included diabetes, hypertension, and treated prostate cancer. No other history of malignancy was reported. He had undergone multiple strabismus surgeries as a child, and was profoundly amblyopic in the left eye despite these attempts at intervention. Cataract surgery had been performed on his right eye. Ultrasound revealed an iris lesion in the superonasal quadrant involving the ciliary body with low to medium reflectivity, with evidence of extrascleral extension. The lesion was diagnosed as an iris melanoma with diffuse

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local dissemination. Enucleation was considered, but was deemed unacceptable as the lesion was located in the patient's better-seeing eye. Gamma knife radiation was performed on the lesion, followed by additional radiation to the entire anterior chamber. Because radiation was likely to cause significant ocular surface compromise, both directly and through destruction of lacrimal gland tissue, the patient was fit with a scleral lens immediately following treatment in an attempt to maintain the integrity of the ocular surface. Following radiation, the patient developed moderate conjunctivitis which was successfully treated with topical steroids, but the cornea remained uninvolved. Ocular surface integrity has now been maintained with the scleral lens for 14 months following radiation, and his best-corrected visual acuity is 20/20 in his right eye.

Orbital radiation may be necessary to treat ocular malignancy. If compromise to the ocular surface is deemed to be a likely side effect of radiation therapy, use of a scleral lens prior to the development of epitheliopathy may delay or prevent the development of severe ocular surface disease, thus maintaining both visual function and ocular comfort for patients undergoing this treatment.

POSTER 11

Evaluation of a 3-Zone Progressive Multifocal Contact Lens Design On Wearer Experience In The Real World

William Reindel, OD

Additional Author(s): Gary Mosehauer

Jill Saxon, OD

Today's presbyopic contact lens wearers have increased near and intermediate demands on vision as use of digital devices grows. A novel 3-Zone Progressive multifocal lens

(balafilcon A) designed to redistribute light energy to improve near and intermediate visual outcomes was evaluated among a population of presbyopic contact lens wearers.

Presbyopic contact lens subjects were fitted with the 3-Zone Progressive multifocal contact lens in this single arm, open-label evaluation. Subjects were enrolled by independent eye care professionals provided a standardized fitting process. Subjects with a finalized prescription completed an on-line survey to capture perspectives of their wearing experiences in real world situations.

A total of 1395 presbyopic subjects were fitted and completed the survey regarding their habitual lens and 3-Zone Progressive lens experiences. Ratings of the habitual lenses indicated that 82.3% found near focus (smart phones/tablets) difficult, 64.4% found intermediate focus (computer/dashboard while driving) difficult, and 59.9% found distance focus (street signs while driving) difficult. The proportion of subject agreement regarding performance attributes associated with digital devices and general wear experiences were statistically significantly greater than 50% ($p < 0.05$). Subjects agreed the lenses were comfortable throughout the day (95.1%) and provided clear vision when using a smart phone or tablet (94.1%), working on a computer (97.5%) and driving during the day (95.0%). In addition, subjects agreed the lenses help relieve frustration of not seeing well (95.6%), help them enjoy wearing lenses (96.0%), and help reinforce their desire to continue wearing lenses (96.6%). Preference over habitual lenses on these questions was also statistically significant ($p < 0.05$).

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POSTER 12

Performance of a Novel Hydrogel Lens Among Contact Lens Wearers That Use Digital Devices and Report Tired Eyes

William Reindel, OD
Additional Author(s): Gary Mosehauer
Robert Steffen, OD

Prolonged use of digital devices is on the rise and can have an impact on the wearing experience of contact lenses. A unique silicone hydrogel lens (samfilcon A) designed to retain moisture and provide a smooth surface was evaluated among a population of lens wearers that use digital technology and report having tired eyes.

Subjects that spend at least 3 hours each workday using a computer or electronic device and experienced tired eyes were assessed in this 2 week, single arm, bilateral, open-label study. Patients were enrolled by 22 independent investigators. Following 7 days of wear, subjects completed an internet survey to capture their perspectives regarding the product. Investigators completed slit lamp examinations (SLE) and exited the subjects, after 2 weeks of product use.

A total of 158 eligible subjects that experienced tired eyes were enrolled. There was no significant difference in SLE > Grade 2 findings between Dispensing and 2-week visits. There were no adverse events. The proportion of subject agreement regarding performance attributes associated with focusing for a long time at digital devices and general wear experiences were statistically significantly greater than 50% ($p < 0.05$). While focusing for long times at digital devices, subjects agreed the lenses were comfortable (87.3%), helped eyes stay moist (78.5%), provided clear vision (89.2%), prevented blurriness (79.7%), and

prevented eyes from feeling tired or fatigued (80.4%). For general wear experiences, subjects agreed the lenses provide clear vision throughout the day (89.9%), provide clear vision when driving at night (91.1%), and made them less aware they are wearing lenses (77.2%). Preference over habitual lenses on these questions were also statistically significant ($p < 0.05$).

POSTER 13

Global Survey of Patient and ECP Satisfaction with a New Daily Disposable Toric Contact Lens

Dwight Akerman, OD
Additional Author(s): Inma Perez-Gomez, MCOptom, PhD
Cecile Maissa, PhD
Jami Kern, MBA, PhD

A satisfaction survey was conducted in Europe and Canada to evaluate the acceptability of a new daily disposable (DD) toric contact lens, nelfilcon A Toric.

The satisfaction surveys were completed by patients and ECPs from 11 different countries (Canada and 10 European countries). Participants were fitted with the DD Toric lens and provided a 2 week supply. Information regarding the lens wearing experience was collected from participants at a follow up office visit after 2 weeks of wear for 8 hours a day. ECPs completed a baseline survey (completed prior to fitting) and a final survey (completed after fitting).

A total of 332 patient surveys and 29 ECP surveys were completed. Average age of the patients surveyed was 35 years with 66% being female; 79% were habitual soft contact lens wearers and 21% new to contact lens wear. After experiencing the lenses over a two

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week period, the percentage of patients who agreed or strongly agreed with the survey statements indicated a high level of satisfaction: 91% for 'clear vision'; 85% for 'could wear all day long'; 82% for 'consistent vision all day'; and 78% for 'comfortable from insertion until removal'. After experiencing fitting the DD toric lens, all ECPs agreed the lens was easy to fit and would recommend it to their colleagues (Agree or strongly agree = 100%) and provided clear vision (97% agreement). The trial fitting experience had a positive impact on DD prescribing for astigmatic patients with the percentage of dailies prescriptions increasing from 25 to 41%.

POSTER 14

Global Survey of Patient and ECP Satisfaction with a New Daily Disposable Multifocal Contact Lens

Dwight Akerman, OD

Additional Author(s): Inma Perez-Gomez, MCOptom, PhD

Cecile Maissa, PhD

Jami Kern, MBA, PhD

Between January and May 2014, a global satisfaction survey was administered to patients and their Eye Care Professionals (ECPs) to evaluate the acceptability of a new daily disposable (DD) multifocal contact lens, nelfilcon A Multifocal (MF).

Satisfaction surveys were completed by new (20%) or existing (80%) soft contact lens wearers and ECPs from Europe (11 European countries) and Canada. Demographic information and pre-survey lens brand and lens wear experience were collected from patients in the office. Participants were then fitted with the DD MF contact lens and provided a 2 week

supply. Information regarding the lens wearing experience was collected from participants at a follow up office visit after 2 weeks of wear. ECPs completed a baseline survey (to complete prior to fitting) and a final survey (to complete after fitting).

367 patient surveys and 31 ECP surveys were collected. The population surveyed included a higher percentage of females (72%) and was well balanced across all age groups (<50yrs=30%, 50-55%=35%; >55%=34%). After two weeks, the percentage of patients who agreed or strongly agreed with the survey statements indicated a high level of satisfaction with the DD MF correction for vision- and comfort-related items (Agreement: 76% for 'clear vision near to far with smooth transitions in between'; 85% for 'could wear all day long'; 82% for 'comfortable from insertion until removal'). Further, 84% of the 153 patients who previously wore monovision reported strongly or somewhat preferring the MF correction. ECPs reported a positive impression of fitting DD MF contact lenses; they found it easy to fit and a welcome addition to their practice (100% strongly or somewhat agreed) and an improvement over monovision (94% agreement). After trial fitting this DD MF, ECPs anticipated prescribing a higher percentage of daily disposable multifocal lenses to their presbyopic patients (After fitting: 69% Prior to fitting: 44%).

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POSTER 15

Implementing Interprofessional Education at Salus University: The Evolution of the Evidence-Based Practice Course

Melissa Vitek, OD

Additional Author(s): Radhika Aravamudhan, PhD

Background : In this evolving health care system , it is vital for professional schools to identify the mechanisms that shape successful collaborative teamwork and effective communication among team members. The Evidence Based Practice (EBP) course at Salus University has evolved since its launch in 2007. The experiences described will illuminate the significance of course delivery pedagogy on student learning and engagement in interprofessional education. Programmatic assessment of the course using quantitative and qualitative data will be shared. Summary: The EBP course is offered to all students enrolled in degree programs at Salus during their first year, first Semester. The course is taught by an Audiologist and an Optometrist. The instructors initially presented lectures in a traditional format to Optometry Physician Assistant and Audiology enrollees. The challenges ranged from choosing relevant curriculum for all participating professions to logistical problems. Over the next few years, there was a shift to a hybrid model of content delivery consisting of a blend of online and on campus lectures partly to accommodate logistical challenges and partly to experiment with teaching pedagogies. After gaining a deeper understanding of IPE models as well as with the addition of the Occupational Therapy (OT) enrollees, small group interactive activities were incorporated which consisted of interprofessional teams applying EBP concepts

to clinical scenarios. After receiving positive student feedback on the small group activity and researching other teaching pedagogies, flipped classroom and team based learning principles were added to the small group work. Students and instructors have provided positive feedback on the highly structured team-based learning principles particularly as they provided more meaningful interprofessional collaboration in the small group exercises. In addition, the flipped classroom concept reportedly provided additional opportunities for students to learn “from and with each other”. Student perception was measured quantitatively by the use of questionnaires. Conclusion: Although this course will continue to adapt based upon the results of ongoing assessment, we have identified a positive trend in student learning as well as student perception of both the course content and the interprofessional collaboration this course provides to students at Salus University.

POSTER 16

Hope Help Connection for Patients with Vision Loss

Priscilla Rogers, PhD

Talking to people about losing their vision is often a very difficult task for doctors and their staff members and with the aging of the population in this country, this situation will occur more and more frequently. This poster will cover how to find critical services that can help a person live successfully with vision loss as well as how to refer patients to appropriate local, state and national services and resources. It will also cover tips and products for helping people to live with vision loss and will include informational resources to share with patients and their families. Why is this important? Persons new to vision loss are often in denial

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and may be very emotional when faced with losing vision. At the time of their appointment, they may not be receptive to learning about helpful resources. Therefore, having a go-to comprehensive resource is critical for doctors and their staffs to use can help bridge the gap. Also, eye care professionals provide a natural gateway to information about the technologies, services, and resources to which people with vision loss need access but may not be aware of the available options themselves (Leutz, et al., 2010). As a result, people with low vision may not hear about vision rehabilitation services from medical providers, according to a 2010 study published by the Centers for Medicare and Medicaid Services Studies. To make the process of referral and locating needed services easier, the American Foundation for the Blind has developed a number of web sites for people with vision loss as well as a free, downloadable app for use with apple and android devices. The App will help doctors and their staffs as well as patients and family members in quickly locating services in any area of the country as well as taking them directly to critical information about living with vision loss such as reading, managing prescriptions, getting around safely, cooking and other household tasks, and even setting up their homes to prevent falls and promote walking safely in familiar environments.

POSTER 17

UIWRSO Vision Science Degree Programs

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Rosenberg School of Optometry (UIWRSO) Vision Science Degree Program is a unique and rigorous program of study leading to undergraduate as well as graduate degrees. The Bachelor of Science in Vision Science includes all basic science coursework typically required for entrance into Professional Optometry Programs supplemented with upper division courses in optics, vision science, neuroscience, as well as ocular anatomy, physiology, pharmacology and nutrition. Moreover, the program includes unique training and clinical experience in patient-based settings. A number of UIW students have successfully completed the BS degree and subsequently entered Optometry Programs with considerable success. There is also a 3+4 option which allows qualified students to complete 3 years in the undergraduate program followed by the Optometry Program with the BS in Vision Science awarded after the first Professional Year. The newly developed Graduate Program in Vision Science offers both Master of Science and Doctor of Philosophy degrees in Vision Science. This unique, innovative program targets early to mid-career Department of Defense (DOD) Optometry officers who are fully-funded to pursue MS or PhD degrees. UIWRSO provides core curriculum and mentorship while partnering with DOD entities to provide thesis and dissertation research opportunities. This unique program provides essential knowledge, skills and abilities for the graduate to make substantive contributions to DOD vision research and development, ultimately enhancing performance, safety, and saving lives.

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POSTER 18

Cylindrical Magnifier Used Successfully to Enhance Reading Performance in Ring Scotoma from Hydroxychloroquine Retinopathy

William Leroy Brown, OD, PhD

Patients with islands of useful vision surrounded by areas of scotoma, as in geographic atrophy and hydroxychloroquine retinopathy, often find overall magnification debilitating due to magnification of detail into the scotoma. Cylinder magnifiers (CM) provide meridional magnification in the vertical meridian only, preserving the visual span horizontally along the line of print

A 59 yo white female presented in May, 2014 having used hydroxychloroquine 400 mg daily for 11 years for the treatment of inflammatory arthritis. Subsequent annual eye examinations revealed no vision complaints not resolvable with changes in glasses. Spectral domain OCT and Humphrey SITA 10-2 visual fields (VFs) were first done in 2011, annually thereafter. Best corrected visual acuities (BCVAs) were 20/20 each eye throughout the first decade of hydroxychloroquine use, including her May, 2014, visit. However at this visit the OCT was interpreted as showing possible changes in the inner segment/outer segment (IS/OS) junction line in both eyes, and subtle changes in the VF, previously been interpreted as scatter, began to appear arcuate-like. After consultation, the rheumatologist discontinued hydroxychloroquine, She returned December, 2014, complaining of grayspots near fixation both eyes for approximately two months with increasing significance. BCVAs were RT 20/30, LT 20/25. No media opacities explained the acuities. VF testing confirmed that despite stopping

hydroxychloroquine, the annular scotomas had become more fully closed, leaving a central island of vision. Usefulness of overall magnification from high add reading glasses or spherically powered hand magnifiers was limited; the visual span was compromised by magnifying the image into the annular scotoma. A CM was used very successfully due to its magnification only in the vertical meridian. She was able to read fluently, using the edge of the CM as a line guide.

CM can be very useful in enhancing reading when islands of vision near the fovea are surrounded by areas of scotoma. Meridional magnification helps preserve the visual span, the CM edge can serve as a line guide, and the cylinder condenses light into a bright field. 2) Decline in visual function can continue after hydroxychloroquine has been discontinued.

POSTER 19

A Comparative Evaluation of Subjective Point Spread Function Refraction Results versus Phoropter-Based Refraction Results in Keratoconus Patients

Paul Karpecki, OD
Additional Author(s): Shui Lai, PhD

The high degree of distortion in keratoconus affects practitioners' ability to obtain best-corrected visual acuity. Traditional phoropter refraction is challenging for keratoconus patients. The asymmetry of the Snellen letters causes more clarity in certain orientations, depending on the patient's cylindrical axis. This makes it difficult to decide when some parts of the letters become clearer while others have gotten more blurry. As such, an alternative refraction method that provides more reliable and accurate endpoints is needed to address the unique challenges presented in

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keratoconus cases. This study evaluates the accuracy and reliability of a novel method of refraction using the PSF Refractor in treating patients with keratoconus.

Fourteen patients (28 eyes) with various stages of keratoconus were recruited in this study. First, phoropter refraction was performed by an experienced refraction technician. For the PSF refraction that followed, patients were asked to look at a single target with a bright symmetrical point, while various optical powers of sphere and cylinders were presented to the patient and subjective responses were required. Visual acuity was recorded using EDTRS eye charts. The accuracy of refraction outcomes was assessed by comparing the best-corrected visual acuity achievable.

Mean spherical equivalent was -4.38 ± 5.55 D (range: -16.25 to $+2.00$ D) with the phoropter, and -4.55 ± 6.64 D (range: -18.63 to $+2.46$ D) with the PSF Refractor. Of the 26 eyes from the 14 patients, 18 eyes achieved higher levels of visual acuity using the PSF Refraction than when using the phoropter. Eight remaining eyes achieved an equal level of visual acuity, and zero eyes in the PSF group achieved worse acuity compared with the phoropter.

POSTER 20

Uncovering Idiopathic Intracranial Hypertension

Jane Trimberger, OD

Idiopathic intracranial hypertension (IIH) is a condition characterized by elevated intracranial pressure and normal neuroimaging of the brain. Presenting symptoms can include: headaches, transient vision loss, tinnitus, or pain along dermatomes of the neck and shoulders. The biggest threat of IIH is vision loss. It is important to properly identify and manage IIH

to prevent permanent, debilitating damage to the visual system.

A 44-year-old African American female presented to the urgent care clinic at the Illinois Eye Institute. She reported pain behind her left eye and ringing in her left ear for over nine months. Her medical history included a diagnosis of cluster headaches. A record review revealed that she presented seven months previously to an outside provider with retrobulbar pain but no observed papilledema. She was treated unsuccessfully for cluster headaches. Visual acuity at the initial visit to the Illinois Eye Institute was found to be 20/20-1 OD and 20/20-1 OS. Ocular motility and color vision was found to be normal OU. The patient's body mass index was approximately 34. Upon further examination, the patient was found to have stage 1 papilledema OU. A Cirrus OCT revealed mild edema that was greater OD than OS. A 24-2 Humphrey Visual Field showed scattered changes and an enlarged blind spot OD and scattered changes OS. An MRI and an MRV were subsequently performed and were found to be normal. Following the neuroimaging, a lumbar puncture was conducted with an opening pressure of 240 mm H₂O. The patient was diagnosed with idiopathic intracranial hypertension. She was treated with acetazolamide 500 mg BID. The patient's headaches slowly began to return and the acetazolamide was subsequently increased to 1000 mg BID. The patient's symptoms were relieved following the initial lumbar puncture and increase in the acetazolamide.

IIH has the potential to permanently reduce vision. A prompt and appropriate work up can rule out other serious differentials and help to maintain good vision. The role of the eye care provider can be key in early identification and proper management.

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POSTER 21

A Rare Case of Atypical Iris Coloboma and Advanced Glaucoma

Aaron Kerr, OD

Coloboma of the iris is a congenital developmental defect that typically results in a “keyhole” shaped pupil located in the inferonasal quadrant of the affected eye. The embryological basis of an iris coloboma that occurs in any other quadrant of the eye is unknown and referred to as “atypical”. An isolated iris coloboma, in the absence of other associated conditions and syndromes, usually does not affect vision and the associated risk of glaucoma is rare.

A 25 year old Caucasian male presented with a history of congenital iris coloboma and glaucoma of the left eye. Examination revealed an atypical iris coloboma located in the superior temporal quadrant of the left eye and a flat filtering bleb superior to a surgical iridectomy. During gonioscopy, visualization of the superior temporal angle revealed an area of angle recession. The visual field was significantly restricted in the left eye and BCVA was reduced to 20/30. Intraocular pressures were measured at 18mmHg OD and 22mmHg OS. C/Ds were noted to be 0.3 OD and 0.75 OS with marked retinal nerve fiber layer thinning OS. The patient stated that glaucoma was diagnosed at age 15 and was already advanced at that time.

Although a typical isolated iris coloboma has a low risk of visual impairment, the eyes must be monitored closely throughout an individual's lifetime as risks of vision threatening conditions do exist. The atypical nature of the iris coloboma in this case is likely related to the development of glaucoma in the affected eye. Unfortunately, due to a delay in early diagnosis

and treatment, the visual prognosis remains guarded.

POSTER 22

Heerfordt Syndrome: A Rare Manifestation of Neurosarcoidosis

Naida Jakirlic, OD

Sarcoidosis is a multisystem inflammatory granulomatous disorder that can have devastating effects on any number of organs, including the eyes. Neurosarcoidosis is a rare but potentially life-threatening condition that affects about 5% of all patients with Sarcoidosis. Even rarer is a particular syndrome that affects the central nervous system and ocular tissues simultaneously, thus placing the eye-care provider at the front lines of diagnosing and managing such patients in order to significantly reduce the morbidity and possible mortality associated with neurosarcoidosis.

A 30 year old Mexican male presents with a recurrent left facial palsy, fever, parotid gland enlargement, and bilateral anterior granulomatous uveitis. His ultimate diagnosis is Heerfordt-Waldenstrom syndrome, a rare manifestation of neurosarcoidosis with multiple simultaneous system involvement, including significant intraocular inflammation and lagophthalmos from recurrent left facial nerve palsy. After a prolonged treatment with topical and oral steroids and collaboration between various specialties including optometry, pulmonology, rheumatology, and neurology, the patient's condition slowly resolved over the course of 3-4 months with minimal adverse sequelae.

Bells Palsy is a diagnosis of exclusion, therefore a recurrent or bilateral facial nerve palsy must raise suspicion for a systemic cause

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that requires a medical work-up. The optometrist thus plays a vital role within the multidisciplinary team required for diagnosing and treating the various systems affected by Sarcoidosis. In fact, the optometrist can oftentimes be the first health care provider in a long chain of health care specialists to initiate the appropriate workup that eventually leads to the correct diagnosis. This in turn results in the initiation of the appropriate and timely systemic and ocular treatment in order to significantly reduce the morbidity and mortality of a potentially fatal and sight-threatening disease.

POSTER 23

Pseudo-Foster Kennedy Syndrome: A Diagnosis of Exclusion

Naida Jakirlic, OD

True Foster-Kennedy syndrome was first described in 1911. Clinically, the patient presents with optic nerve head pallor in one eye due to compression by a subfrontal meningioma and optic nerve head edema in the fellow eye due to increased intracranial pressure. While true Foster Kennedy syndrome is rare, it must be ruled out with neuroimaging before other more likely etiologies are considered.

A 64 year old white male presented to clinic complaining of vision blur in the right eye. He reported a gradual onset of blurry vision that took place over a one month period. Prior to presentation, he reported an unremarkable ocular history. His medical history was positive for hypertension and hypercholesterolemia, both of which were well controlled with systemic medications. Best corrected visual acuities were 20/60 OD and 20/30 OS. Entrance tests were unremarkable, and there was no APD present. A dilated fundus exam revealed a mildly swollen

right optic nerve with an overlying drance hemorrhage, and significant pallor of the left optic disc. A full workup was conducted as warranted by the clinical presentation, but was unremarkable, thus the patient was diagnosed with pseudo-Foster Kennedy syndrome likely secondary to bilateral sequential non-arteritic ischemic optic neuropathies.

The clinical presentation of optic nerve swelling in one eye and optic nerve pallor in the fellow eye always necessitates a full workup including neuroimaging in order to rule out a sub-frontal meningioma. Although pseudo Foster Kennedy is usually the actual culprit, it is a diagnosis of exclusion and every optometrist must be cognizant of the necessary management of patients who present with similar findings. Most often the cause is a sequential bilateral non-arteritic ischemic optic neuropathy; however, a space-occupying lesion must always be ruled out.

POSTER 24

Rapid Visual Field Decline: The First Sign of Aggressive Pituitary Macroadenoma Recurrence

Naida Jakirlic, OD

Pituitary adenomas are benign tumors of the pituitary gland affecting about 10% of the population. They are typically benign slow-growing adenomas; however, aggressive growth can occur in some patients. Any adenoma greater than 1 cm has the potential to cause visual field defects and vision loss due to compression of the optic chiasm. Although optometrists may not always be the first providers to initially diagnose a pituitary tumor, we are an essential part of the multidisciplinary team necessary to ensure optimal visual outcome through careful monitoring of the

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patient's visual acuity, visual field, and optic nerve head status.

A 34 year old Hispanic male presented to clinic complaining of a one-month onset of sudden vision loss in the right eye. His medical history was positive for a non-secreting pituitary macroadenoma that was successfully resected 8 years prior to presentation. His best corrected VA was counting fingers at 1 foot OD and 20/20 OS. There was a grade 4 RAPD present in the right eye. DFE revealed significant pallor of the right optic nerve, while the left optic nerve appeared well-perfused and healthy. Visual Field testing revealed a dense temporal scotoma in the right eye extending into the nasal hemifield, and an early temporal scotoma respecting the vertical midline in the left eye. MRI revealed a large pituitary macroadenoma, which was subsequently resected. Although the patient's VA did not improve in the right eye, both visual fields showed improvement with complete resolution of the temporal defect in the left eye after tumor resection. The patient was monitored every 3 months with serial visual fields. 9 months after surgical resection, there was worsening of both visual fields, and the patient underwent craniotomy again, resulting in improvement of his visual fields shortly afterward.

Although relatively uncommon, pituitary adenomas can sometimes exhibit aggressive behavior and recurrence, posing a significant threat to vision. Thus, the optometrist plays a critical role in providing close monitoring of all patients with a history of pituitary tumors and can oftentimes be the first provider to detect recurrence of a tumor by testing the patient's visual field status.

POSTER 25

Neuromyelitis Optica – Case Report and Diagnostic Update

Joy Harewood, OD

Neuromyelitis Optica (NMO) is a rare immune-mediated disease that combines optic neuritis with transverse myelitis. This case report will review making the difficult diagnosis of neuromyelitis optica (NMO). I will review important steps in diagnosis and how relatively new blood test can aid in the final diagnosis.

A 33-year-old white male presented to the Staten Island University Eye Clinic complaining of blurred vision OS greater than OD for the last 10 days. He reported having pain on eye movement OS, although this had resolved at the time of the initial examination. He also reported numbness and weakness in his lower extremities for roughly the same time period. He had no significant prior ocular or medical history. The best-corrected vision was 20/30-2 OD and 20/20- OS. Pressures were within normal limits and color vision was 12/12 OD and 11/12 OS. Pupils were round and reactive to light with no afferent papillary defect. Extra-ocular movements were full with no pain or nystagmus. Posterior segment examination revealed papilledema OS greater than OD with hemorrhages OS. A 30-2 Humphrey visual field OD showed a few scattered defects OD, and an enlarged blind spot OS. An MRI of the brain and orbits with and without contrast was within normal limits, while there was one lesion noted on the MRI of the cervical spine. This was considered inconclusive. The blood was then tested for NMO Antibody (otherwise known as aquaporin 4 receptor antibody). The results were positive. That along with the clinical signs and symptoms confirmed the diagnosis of NMO, even in the presence of

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inconclusive MRI findings.

NMO is a rare disease that is difficult to diagnose. Modern tools, such as the test for serum aquaprin 4 receptor antibodies, aid in diagnosis, so the proper treatment can be started in a timely fashion.

POSTER 26

Early Diagnosis of Sjögren's Syndrome in a Young Adult

Aaron Kerr, OD

Sjögren's Syndrome is a chronic, slowly-progressive, inflammatory autoimmune disease characterized by lymphocytic infiltration of the exocrine glands causing dryness of the eyes and mouth and can affect other organs of the body. Sjögren's Syndrome can occur alone or in conjunction with other autoimmune diseases and primarily affects women in their fourth or fifth decade. The most serious complication of Sjögren's Syndrome is the significant increased risk of lymphoma.

A twenty-one year old female presented with complaints of dry eyes and dry mouth for one year. Medical history included treatment for anxiety and fibromyalgia, and a history of hypothyroidism and celiac disease. Anterior segment examination revealed a decreased TBUT of 4 seconds in each eye. Sodium fluorescein staining revealed areas of SPK on the inferior cornea of each eye and Lissamine green staining was present on the inferior palpebral conjunctivae. Schirmer test results were 4mm OD, OS. The dilated fundus examination was unremarkable. The patient was diagnosed with Dry Eye Syndrome with suspected Sjögren's Syndrome. Omega-3 supplements and artificial tear therapy were prescribed and a new advanced diagnostic panel of blood work was ordered for the early

identification of Sjögren's Syndrome.

Sjögren's Syndrome is difficult to diagnose since its symptoms may mimic those related to other conditions. There is an average delay in diagnosis for most patients of four to five years and some studies indicate a much longer wait before a correct diagnosis is given. At this point patients are often in late stages of the disease after gland degradation and other organ damage has occurred. Traditional biomarkers revealed through blood tests are important indicators of the disease potential, but are not specific to Sjögren's Syndrome. New advanced testing is now available that shows significantly higher sensitivity and specificity than with traditional screening methods which promise to aid in early detection. Because dry eye is the hallmark symptom of Sjögren's Syndrome, eye care practitioners are in a unique position to help with early identification of the disease so that effective treatment and management can begin.

POSTER 27

Non-Arteritic Anterior Ischemic Optic Neuropathy in a Young African American Male

Kelli Theisen, OD

**Additional Author(s): Christina Morettin, OD
Leonard Messner, OD**

Non-arteritic anterior ischemic optic neuropathy (NAION) represents the most common acute onset optic neuropathy in patients over the age of 50, though no age is immune. Symptoms of NAION include sudden, painless vision loss, most frequently upon awakening. Visual acuity may be reduced and an arcuate or altitudinal visual field defect, particularly inferior, is common. In the acute setting, an ischemic event involving the anterior portion of the optic nerve head leads to

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unilateral optic disc edema. Disc hemorrhaging typically accompanies the edema. On average, the optic disc edema resolves within 4-8 weeks with subsequent retinal nerve fiber layer (RNFL) loss and diffuse or segmental optic disc pallor. There is no well accepted treatment for acute NAION.

This case represents NAION in a 32 year old African American male presenting with a complaint of painless blurry peripheral vision in the left eye for 2 weeks. Clinical examination revealed 20/20- acuity, an APD, and unilateral optic disc edema and hyperemia without disc hemorrhaging in the affected eye. Visual field testing showed a superior altitudinal defect in the affected eye. To rule out optic neuritis, an MRI of the brain and orbits was ordered which did not reveal enhancement of the affected optic nerve or anomalies of the brain. A coincidental granuloma of the right lung without bilateral hilar lymphadenopathy was identified with chest CT, while serum ACE levels were within normal limits. Laboratory testing for syphilis, diabetes, and hyperlipidemia were unremarkable, and the patient did not have hypertension. Using OCT technology, the optic disc edema persisted longer than average, resolving at the 4 month follow up. At that time and without treatment, the superior altitudinal field defect significantly improved.

Though NAION typically presents in patients over the age of 50, younger individuals are not immune to the condition. This case represents atypical NAION in a young individual without optic disc hemorrhaging, optic disc edema persisting beyond the typical 2 months, and significant visual field improvement. In the atypical acute setting in young patients, other organic causes for unilateral optic disc edema, including optic neuritis, must be ruled out.

POSTER 28

Assessment of Corneal Hysteresis Measured by the Reichert Ocular Response Analyzer as a Screening Tool in Patients with Glaucoma

Justin Schweitzer, OD

Additional Author(s): Molly Ervin

John Berdahl, MD

Mitch Ibach

To use corneal hysteresis (CH), to determine risk level of new patients presenting as a glaucoma suspect, mild glaucoma, moderate glaucoma, or severe glaucoma.

A retrospective review of 126 consecutive eyes presenting for the first time to a glaucoma subspecialty clinic. All eyes underwent measurement of CH with the Reichert Ocular Response Analyzer and intraocular pressure with Goldmann applanation tonometry (IOPgat). Eyes were classified as high CH (> or equal 10) n = 51 or low CH (less or equal 9.9) n = 75 and then categorized into glaucoma suspect, mild glaucoma, moderate glaucoma, or severe glaucoma based on 24-2 Humphrey visual field testing. Additional data included number of topical glaucoma medications.

11.8% of eyes with a high CH had moderate or severe glaucoma. 88.2% of eyes with a high CH were glaucoma suspects or had mild glaucoma. Mean IOPgat was 20.5mmHG +/- 4.72 mmHG (p<0.05) on 1.8 medications +/- 1.26 medications (p<0.05) in the moderate/severe glaucoma group and 20.2mmHG +/- 4.95mmHG (p<0.05) on 0.66 +/- 0.65 medications (p<0.05) in the glaucoma suspect/mild glaucoma group. 45.4% of eyes with a low CH had moderate or severe glaucoma. 54.6% of eyes with a low CH were glaucoma suspects or had mild glaucoma. Mean IOPgat was 19.5 mmHG +/- 7.56 mmHG (p<0.05) on 1.77 medications +/- 1.17

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medications ($p < 0.05$) in the moderate/severe glaucoma group. Mean IOP_{gat} was 17.6 mmHG +/- 5.48 mmHG ($p < 0.05$) on 0.65 medications +/- 0.65 medications ($p < 0.05$) in the glaucoma suspect/mild glaucoma group.

POSTER 29

Spontaneous Traumatic Macular Hole Closure in a 46 year old Caucasian Male

Joy Harewood, OD

Additional Author(s): Naida Jakirlic, OD

Traumatic macular holes (TMH) are common complications of ocular contusion injury. The prevalence of TMH is between 1% and 9%. They are thought to occur as an immediate concussive tear during the traumatic event or as a belated breakdown of traumatically induced cystoid changes within the macula. Spontaneous closure of TMH is rare but possible, especially in younger patients under the age of thirty. While the mechanism behind TMH closure is still unclear, it is postulated to be due to glial and RPE cell proliferation at the edges of the hole.

A 46-year old Caucasian male presented to clinic complaining of blurred central vision in the left eye following blunt trauma to the eye during an altercation the previous day. He denied any flashing lights or floaters. His best corrected visual acuity was 20/20 OD and 20/50 OS. A dilated fundus exam revealed a small full-thickness macular hole in the left eye. After multiple close follow-up visits and serial OCT monitoring, the patient's macular hole resolved completely within a month and his vision returned to 20/20.

Although uncommon, spontaneous closure of TMH typically occurs between 3-6 months following blunt trauma. Favorable factors for TMH closure include younger age (11-19 years),

small size ($< 1/3$ disc diameter), and absence of surrounding subretinal fluid. Serial OCT scans and careful clinical follow-up should be implemented in such cases in order to avoid unnecessary vitreo-retinal surgery. While the patient in this case report is unique due to his older age and full visual recovery, taking the conservative approach was extremely beneficial for him as he was able to avoid an ultimately unnecessary surgery.

POSTER 30

A Single-Center Evaluation of a Retaine™ Ophthalmic Emulsion in Subjects with Dry Eye

Paul Karpecki, OD

Additional Author(s): George Ousler

Doug Devries, OD

Dry eye patients often complain of impaired visual function during everyday tasks such as reading and driving, and more specifically, while completing these activities at night. Historically, central corneal staining has been directly linked to visual function—the greater the severity of central corneal epithelial damage, the greater the degree of visual performance deterioration. This study was designed to evaluate the efficacy of Retaine™ ophthalmic emulsion on ocular surface staining and visual function in subjects with dry eye.

This single-center study consisted of two visits over approximately two weeks. Study participants received 1-2 drops twice daily (BID) of Retaine™. Subjects were instructed to complete a symptomatology diary prior to drop instillation through the morning of Visit 2. Ocular sign and symptom assessments, including corneal staining and mean breakup area, corrected visual acuity (CVA) degradation between blinks, and quality of life and comfort assessments were conducted at both visits.

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Forty two subjects with a mean age of 61.6 years were enrolled in the study. From Visit 1 to Visit 2, subjects had significantly less corneal fluorescein staining in several regions, including the central region. In this region, the mean score decreased from 1.25 at Visit 1 to 0.95 at Visit 2 ($p=0.017$). At Visit 2, there was a 40% reduction ($p=0.026$) in mean breakup area between the pre and post dose assessments. Additionally, subjects experienced a 41% increase in their times at CVA at Visit 2 ($p=0.0697$).

POSTER 31

Choroidal Melanoma

Sowmya Srinivas, OD

Choroidal melanoma is a potentially lethal ocular diagnosis that warrants early detection and treatment for the best prognosis. The following is a case in which a choroidal melanoma evolved from a pre-existing choroidal nevus.

A 45 year old Caucasian male presented with complaint of new onset of flashes of lights in the OD only. The ocular history is notable for choroidal nevus OD. The visual acuity was 20/25 OD, 20/20 OS. Pupils, extraocular muscles and confrontation fields were normal. Slit lamp exam was unremarkable OU. The intraocular pressure was OD 14, OS 14 mm Hg at 1 PM measured by Non Contact Tonometry. Dilated fundus exam was normal except for a suspicious choroidal lesion in the superior nasal arcade extending from the optic nerve head with subretinal fluid OD. It measured 5 x 3 mm, and it was about 3 disc diameters from the fovea. The choroidal nevus OD that was documented at prior eye exams had increased in size and exhibited qualities of choroidal melanoma including photopsia

symptoms, location adjacent to the optic nerve head, enlargement and elevation. The patient was referred to Massachusetts Eye and Ear Infirmary for evaluation of the choroidal lesion OD. Diagnostic testing was performed including Optical Coherence Tomography (OCT) which confirmed subretinal fluid temporal and nasal to the disc near the tumor. Fluorescein angiography (FA) showed mottled hyperfluorescence over the lesion with late leakage and mild pooling of dye at margins of subretinal fluid inferior to the lesion. The A and B-scan was performed. The diagnosis was confirmed as a small peripapillary melanoma OD and the treatment was proton beam radiation. Systemic workup of liver function test and CT of the lung was obtained to complete diagnostic testing to rule out metastasis. The liver enzyme panel was normal. CT thorax revealed a right lung nodule, noted to be a benign lesion.

Choroidal melanoma is a potentially lethal ocular diagnosis that is feared by patients and clinicians alike. Clinical exam and diagnostic techniques are used to confirm the diagnosis. Treatment options should be tailored to the patient factors and the size of the melanoma.

POSTER 32

Herpes Zoster Ophthalmicus Presenting with 6th Nerve Palsy and Anterior Uveitis

Lindsay Gibney, OD

Additional Author(s): Edward Wasloski, OD

Herpes Zoster Ophthalmicus (HZO) can have many ocular manifestations. Of those, uveitis is one of the most common and can occur in the absence of keratitis or dermatitis. HZO can also be a cause of cranial nerve palsy. The patient in this case presented with zoster dermatitis that later manifested with uveitis and 6th nerve

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palsy.

A 74 year old white female presented to our practice referred by her primary care provider due to recent onset of shingles involving the left forehead. At the initial visit she was without ocular complaint or complication. Upon return, two weeks later, she complained of intermittent diplopia, photophobia and eye pain. Examination was significant for anterior uveitis OS along with 6th nerve palsy OS. However, diplopia was unable to be elicited on exam even though the patient was clearly restricted in left gaze OS. The presence of suppression made it difficult to determine the cause of the palsy. The patient recalled a history of blunt orbital trauma to the same side of the head many years prior. It was considered as a possibility that the condition was longstanding, due to trauma and had been overlooked. The patient was also a diabetic, though she maintained that her blood sugar remained under good control. The patient was treated with topical steroids and oral antivirals. The palsy ultimately resolved without complication after the completion of treatment.

This case is interesting because of the presence of 6th nerve palsy with multiple potential etiologies including diabetes, orbital trauma and recent onset of shingles. HZO can manifest in many different forms and its incidence will likely rise with an aging population. This case also demonstrates that complications may not manifest at onset and vigilance is necessary to ensure early management of ocular complications.

POSTER 33

Diurnal Variation in TFBUT and NIKBUT in Patients With and Without Dry Eye

Molly Gorder

**Additional Author(s): Edward Jarka, OD
Amy Schaag**

Dry eye affects millions of Americans and the methods used to evaluate this disease often produce unreliable results. Without reliable diagnostic tests, dry eye disease will continue to be subjectively evaluated by researchers as well as clinicians. Current techniques provide data which vary not only within a particular visit, but also throughout the day.

Our study analyzed the results of commonly used measurements for dry eye symptoms throughout the day including tear film break up time using fluorescein. We compared the results of these measurements to survey information provided by participants using the Ocular Surface Disease Index (OSDI). Measurements of another potential indication of dry eye, the Non-Invasive Keratograph Break-Up Time (NIK BUT) were performed using an Oculus Keratograph 5M. Participants ranged in age from 22 to 29 years old.

We found that the majority of patients were classified in the same category as the OSDI, either normal or mild to moderate dry eye, for the morning measurements using both NIK BUT and TFBUT. Similarly the majority of patients had TFBUT and NIK BUT values in the afternoon which agreed with the classification based on the OSDI. However, the results of the evening measurements of TFBUT agreed with the OSDI in the minority of patients compared to the majority of patients using the NIK BUT.

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POSTER 34

Bilateral Cystoid Macular Edema in Retinitis Pigmentosa and Its Management

Lindsay Gibney, OD

Additional Author(s): Christina Antonopoulos, MD

Cystoid macular edema (CME) is a major and sometimes overlooked complication in patients with Retinitis Pigmentosa (RP). In general, central vision is typically well maintained in patients with RP with about half of patients maintaining 20/40 or better vision in at least one eye. Causes for central vision loss include cataracts, macular atrophy and macular edema.

A 27 year old white male presented with an uncertain history of RP accompanied by bilateral macular edema. He complained that two days prior to the visit, the vision in his "good" eye dramatically decreased. BCVA was 20/400 OD and 20/200 OS. The patient had not sought care recently due to costs and lack of insurance, but had previously been seen by multiple specialist with differing diagnoses. The last retinal specialist he saw had diagnosed him with RP and macular edema. Marked cystoid macular edema was evident on the macular OCT scans OU, while the peripheral retina demonstrated subtle bone spicules 360 degrees OU. Topical and oral carbonic anhydrase inhibitor (CAI) therapy was initiated along with a retinal consult. Ultimately, the patient continued with only topical therapy due to cost and was referred for a low vision consult.

CME is an important cause of vision loss in RP and responds differently to therapy than CME from other conditions such as diabetes or vein occlusion. RP patients do not respond well to anti-VEGF therapy in contrast to those with vascular disease. First line therapy is with a

CAI. Oral CAIs are thought to be more efficacious, but topical therapy is beneficial as well. Studies with Triamcinolone injections have shown mixed results, usually only resulting in short term benefit. Macular edema in RP can be difficult to treat. Vitamin therapy has shown some benefit, but responsiveness may relate to specific genotypes and more research needs to be done to realize its potential.

POSTER 35

Management of 2-month-old Girl with Periorbital Infantile Hemangioma

Muriel Schornack, OD

Additional Author(s): Tomo Yamada, OD

Infantile hemangioma (IH) affects 10% of infants, and is the most common benign, congenital, vascular periorbital tumor. Typically, IH initially grows very rapidly, and then gradually involutes. Periorbital IH can potentially obscure the visual axis or deform the cornea, causing significant astigmatism, which can result in amblyopia.

LJ, 2-month-old, 4.43 kg girl, was seen in the eye clinic for a lesion on her right lower eyelid that had been present for 7 weeks. LJ's gestational age was 37 weeks. LJ was able to fix and follow with each eye. Ocular alignment and motility were normal. Pupils were reactive to light with no afferent defect. Retinoscopy revealed +2.00 DS in each eye. A 1.2 cm non-pulsatile, fleshy nodule was noted on the lateral aspect of LJ's right lower eyelid. Conjunctiva and corneas were clear. LJ's optic nerve heads and retinal examination were normal. LJ was diagnosed with hemangioma of her right lower eyelid. The lesion did not obscure her visual axis. Nevertheless, given the lesion's proximity to her cornea and her very young age, there was concern that it may

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induce astigmatism and potentially cause amblyopia. Consultation was requested with a pediatric dermatologist and baseline eyelid photographs and echocardiogram were obtained. After discussion of potential side-effects, LJ was initiated on 1 mg / kg / day oral propranolol. Blood pressure and heart rate remained stable after her initial dose. She returned for follow up every 2 weeks, and propranolol dosage was gradually increased to 3 mg / kg / day over the next 4 months, with close monitoring of her heart rate and blood pressure. LJ tolerated the propranolol well. The hemangioma involuted significantly after her first month on treatment, with further reduction over the next 3 months. Periodic photographs were taken, documenting its involution.

Periorbital IH can pose a high risk for amblyopia in addition to being cosmetically alarming. Oral propranolol has been found to be effective in treating IH lesions. As a non-selective beta-blocker, close monitoring of potential side-effects such as mood disturbance, hypoglycemia, GI upset, bronchospasm, hypotension, and bradycardia are important.

POSTER 36

Co-Management of Dropless Cataract Surgery

Jenna O'Brien, OD

Many surgeons are starting to inject medication into the vitreous at the end of cataract surgery reducing or eliminating the need for eye drops. It is important to know the options available, be comfortable co-managing changing techniques, and be able to answer patient inquiries.

A 56 year old Caucasian male came in for a cataract evaluation. Patient complaints

included decreased vision and halos at night. BCVA was 20/30-2 OD, 20/50+1 OS and BAT was 20/40- OD. All testing and ocular structures were normal excluding the lens which showed combined 2+ cortical, 2+ posterior subcapsular, and 2+ nuclear cataracts OU. The patient elected to proceed with cataract surgery and chose the multifocal lens option. Surgery was performed on the right eye, Tecnis Multifocal lens was inserted and 15/1 mg/mL Sterile Injection of Triamcinolone-Moxifloxacin PF was injected trans-zonular into the vitreous at the end of surgery. Patient was instructed to wear an eye shield and sleep with head elevated that night. 1 day post op OD as follows: VAsc: 20/25, IOP: 16mmHg, Cornea: 2+microcystic edema, temporal folds, temporal clear corneal incision, (-) Seidel, A/C: 1+ cells, Iris: normal, and Lens: centered. No drops indicated. 1 week post op OD as follows: VAsc: 20/20, IOP: 10mmHg, Cornea: 1+ microcystic edema, temporal folds, temporal clear corneal incision, (-) Seidel, A/C: trace cells, Iris: normal, and Lens: centered. 1 month post op OD as follows: VAsc: 20/20 distance, intermediate, and near, IOP 10mmHg, Cornea: temporal clear corneal incision, A/C: deep and quiet, Iris: dilated, Lens: centered, and DFE showed normal nerve, macula, and peripheral retina.

Co-managing dropless cataract surgery is similar to the traditional postoperative management without the time consuming drop instructions. The addition of drops to promote healing or lower pressure may be indicated on a case by case basis, but with the majority of patients no drops are needed.

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POSTER 37

Breast Cancer Metastasis to the Optic Nerve

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Edward Jarka, OD

Breast cancer metastasis to the optic nerve is an extremely rare complication with few cases reported in the literature since the early 1900s. While breast cancer does metastasize with some frequency to the eye, it most often seeds in the choroid, and rarely the iris or ciliary body. Because ocular metastasis frequently forebodes metastases elsewhere, it is essential to promptly identify and refer patients who present with ophthalmic findings.

A 54 year old African American female presented to clinic with complaints of a constant, worsening, painless "film" over her left eye which began upon awakening. Medical history was significant for inflammatory breast cancer for which she had a double mastectomy in 2012. Current medications included tamoxifen and vitamin supplementation. Best-corrected visual acuities were 20/20 OD and 20/60 OS. Extraocular motilities were full and painless, and pupils were reactive with a subtle afferent pupillary defect. Intraocular pressures were 17mmHg OU and blood pressure was 110/76. Anterior segment and fundus evaluation were completely unremarkable. Automated perimetry revealed a quadrantanopia-like nasal field defect, OS only. The patient returned one week later for follow-up, and best-corrected acuity measured 20/20 OD and NLP OS, with a frank APD OS. Intraocular pressures were 14mmHg OU and anterior segment evaluation was unremarkable. Dilated examination revealed trace optic disc edema OS but was

otherwise unremarkable. One week later in retina clinic, the best-corrected visual acuity remained 20/20 OD and NLP OS. Intraocular pressures were 13mmHg OU and anterior segment evaluation remained unremarkable. Posterior segment evaluation revealed trace cells in the vitreous OS with no evidence of metastasis. The patient was promptly referred for further testing including MRI, ESR, CRP, ACE, chest x-ray, FTA-Abs, RPR, and CBC. Magnetic resonance imaging revealed a large mass on the optic nerve, which the oncologist attributed to breast cancer metastasis. The patient was immediately scheduled for radiation therapy to reduce the tumor size.

This case of metastasis resulted in swift, progressive and painless reduction in vision. We will review differential diagnoses, comprehensive work-up, management and prognosis for ophthalmic breast cancer metastases.

POSTER 38

Diagnosis and Management of Dense Deposit Disease

Muriel Schornack, OD

Additional Author(s): Alaina Softing Hataye, OD

Extensive bilateral cuticular drusen in young adults may be pathognomonic for Dense Deposit Disease (DDD), a rare autoimmune kidney disease that is associated with this finding in 80% of affected patients. This poster describes the management of a young patient with new macular drusen.

A 32 year old female presented for a contact lens evaluation with no concerns. Her last exam at our office revealed no ocular abnormalities. She reported good general health, a decreasing smoking status and a

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family history of glaucoma. Medications included glycopyrrolate, nicotine patch and prenatal vitamins. Best corrected visual acuity was 20/20 OD and OS with myopic astigmatism. Cover test, motilities, pupillary reaction and confrontation fields were normal. Intraocular pressures, as measured by Goldmann tonometry were 14mmHg OD and OS. Dilated fundus examination showed symmetric CD ratios of .4 OU and numerous small hard drusen in both maculae with no pigment changes. Spectral domain OCT confirmed multiple small nodular elevations of the RPE layer with no fluid and normal ISOS junctions. Color photographs were also taken. Values were normal for the following labs: creatinine, sodium, potassium, glucose, chloride, bicarbonate, CBC and urinalysis indicating normal renal function at this time. The patient was asked to return for annual examinations with imaging. Her primary physician was notified of the findings.

Abnormal deposits on the glomerular basement membrane, which is morphologically similar to Bruch's membrane, causes damage and disrupts the filtration system. It manifests in childhood or young adults with blood in the urine, dark foamy or cloudy urine, swelling of almost any part of the body, high blood pressure, decreased urine output and decreased alertness. The risk of vision loss over time is due to choroidal neovascular membranes or geographic atrophy. Approximately 50% of patients progress to end-stage renal failure requiring dialysis or a kidney transplant. Given the potentially devastating systemic sequelae of DDD, the condition must be ruled out in any young patient with new drusen. Although this patient shows no renal dysfunction at this time, the possibility of this disease warrants close monitoring of both retinal findings and signs of glomerulonephritis.

POSTER 39

Case Series Describing Retinal Manifestations Along with OCT findings Amongst Patients of Fabry Disease

Munish Sharma, OD

Additional Author(s): Pinakin Gunvant Davey, OD, PhD

Raymond Maeda, OD

Fabry disease is rare X-linked genetic due to deficient activity of the lysosomal hydrolase, -galactosidase A. Although ocular manifestations do not cause significant visual impairment in most patients but can be of significant diagnostic and prognostic value. Ocular manifestations of Fabry disease range from conjunctival vascular abnormalities, corneal opacities (cornea verticillata), lens opacities and retinal vascular abnormalities, of which corneal verticillata are most typical.

Increased tortuosity of the retinal vessels is common but not diagnostic of Fabry disease and are better appreciated with fluorescein angiography. We are here presenting case series of diagnosed cases of Fabry disease with both normal and abnormal retinal findings. We have further evaluated the patients with positive and negative retinal findings with OCT and will be discussing OCT finding.

This will be first case series describing OCT findings of Fabry disease and will provide insight into this rare disease condition with unique role of Optometrist in diagnosis and management.

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POSTER 40

Clonazepam induced Nystagmus and Adverse Event Reporting

Clarissa De Paz, OD

Additional Author(s): Agustin Gonzalez, OD

Nystagmus can be classified into two broad groups, pathological and physiological with clinical classifications within each. Drug induced nystagmus is a more rare condition. Literature reports the percentage of Clonazepam patients where Nystagmus is reported as an adverse event to be 0.018%. This case presents nystagmus as a rather uncommon ocular complaint and a complication of abuse of Clonazepam. Clinical findings, management and proper adverse event reporting are discussed.

A 27 year old healthy female being treated for anxiety and panic disorders with Clonazepam (20mg/d) showed to our clinic with signs and symptoms of nystagmus lasting 3 days. The patient also reported concomitant mild dizziness and vertigo. Upon questioning patient acknowledge using a higher dosage (30mg/d) of Clonazepam than prescribed. Patient was initially diagnosed as having an adverse effect to Clonazepam. After diagnostic work up and consultation with psychiatry and neurology, addiction management with tapered discontinuation and substitution of the medication was advised. After a 6 week period, the patient experienced improvement of both signs and symptoms of nystagmus.

Conclusion: This case highlights the recognition of ocular symptoms as adverse events of dosage dependent origin. The importance of medication reconciliation and dosing information and attention to concomitant clinical findings. It is believed in this case the higher dose of Clonazepam acts by binding to the benzodiazepine site of the GABA receptor

enhancing the electric effect of GABA binding on neurons increasing the flux of chloride ions into the neurons and resulting initial presenting complaint. It is important to be able to recognize drug related adverse ocular and systemic side effects when they occur in association with drugs commonly used. It is equally important to use the proper mechanism for reporting adverse events is also presented.

POSTER 41

Acute Diplopia: Insidious Presentation of Cavernous Artery Aneurysms

Keren Yang, OD

Acute diplopia often presents a diagnostic challenge. Because acute diplopia is a hallmark of both ocular and systemic diseases, optometrists must be able to determine the principal cause without delay. Appropriate investigations and management of acute diplopia are briefly outlined in this case report.

A 61-year-old female presented with acute double vision. The patient reported bumping heads with her grandson seven days prior to the visit and experiencing headache since the incident. The patient also reported mild blurry vision that had progressed into double vision. The patient's corrected visual acuities were 20/30 OD and 20/20 OS. Confrontational visual field test was normal in both eyes. Limited abduction of the right eye was observed. No proptosis was noted. Pupils were normal in both eyes. Neither step-off nor hypesthesia was found. Color vision was normal in both eyes. Anterior segment exams showed early nuclear sclerosis OU. Posterior segment exams were unremarkable. A maxillofacial computed tomography (CT) scan was ordered. Results suggested an isolated right clinoid process fracture with surrounding 1.1 cm

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hematoma compression of the right optic nerve. The patient was sent for a neurosurgery evaluation. Non-contrast and contrast-enhanced CTs of the brain and a computed tomography angiogram (CTA) of the cranial vessels were ordered. The CTA revealed partially thrombosed right cavernous carotid artery aneurysms with extensive atherosclerotic calcification of the bilateral cavernous carotid arteries. A repeat CT-maxillofacial found no clinoid fracture but showed prominent atherosclerotic calcification of the bilateral cavernous carotid arteries. A CT-head showed normal optic nerves and orbits with no retrobulbar or intracranial hemorrhages. The rectus muscles appeared normal. The patient was admitted to neuro-critical care on the same day and underwent pipeline embolization.

In a case of acute diplopia, possible causes can be deduced down to vasculopathy, trauma, cavernous sinus mass, and stroke. Management of acute diplopia should include a detailed history and imaging of the orbit. This case demonstrates the importance of timely investigations and collaboration with other specialists, which saved the patient from life-threatening consequences of cavernous artery aneurysms. Timely diagnosis can save patients not only from sight-threatening conditions but also from more devastating systemic diseases.

POSTER 42

Evaluation and Management of a Long-Standing Periorbital Foreign Body

Keren Yang, OD

A long-standing metallic periorbital foreign body is rare but warrants careful investigation because of potential complications from its presence. Management of an orbital foreign body depends on its nature, size, and the

presence of related injuries. The following case outlines the evaluation and management of a long-standing periorbital foreign body.

A 64-year-old male presented with a 1.8 mm metallic foreign body identified during pre-magnetic resonance imaging (MRI) orbital X-ray in his left eye. The patient reported no ocular discomfort or complications. The patient's uncorrected visual acuities were 20/30 OD and 20/25 OS. The foreign body was not palpable. Confrontational VF was normal in both eyes. Pupils and EOM were normal in both eyes. Anterior segment exams showed early nuclear sclerosis OU. A gonioscopy exam showed open angle with no signs of angle damage. Posterior segment exams were unremarkable with no presence of intraocular foreign bodies. The patient was referred for an evaluation of possible surgical evaluation. A computerized tomography (CT) of the orbits was ordered to determine the exact location of the foreign body. The CT scan identified the size of foreign body to be 4.7 mm. The dense metallic foreign body was found to be located just inferior to the lacrimal gland and adjacent to the inferolateral quadrant of the left globe. The globe was intact and the optic nerve complexes and ocular musculature appeared normal. No orbital fractures or deformities were found. This case was also discussed with radiologists. Given the position and the size of the foreign body, there were no contraindications to an MRI. The MRI was done the next day without any incident.

Indications for surgical extraction include presence of ocular injuries, signs of optic nerve compression, infection, and ophthalmoplegia. Radiological studies are an essential part of the management plan. CT is superior to X-ray in localization of metallic and glass foreign body. MRI is superior in detecting organic foreign bodies because of its excellent soft tissue contrast resolution. The best management of a long-standing periorbital foreign body is

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observation because surgical intervention may result in more serious complication.

POSTER 43

Establishing a Reference Normative Database for Visual Quality in Adolescent Children

Eric Brooker, OD

Additional Author(s): Jaime Martiz, MD

Understanding the quality of vision throughout the human life cycle is crucial in order to understand the changes the human eye undergoes during aging. It also can provide reference data to be able to provide a standard for quality of vision in healthy patients versus those with pathology or abnormalities in order to aid optometrists in making early clinical diagnosis. An Instrument called the HD Analyzer (Visiometrics, Spain), utilizes a double-pass technique, to measure Intraocular light scatter to objectively measure optical quality of the eye. Although several studies have already analyzed the optical performance of the eye in an adult population using similar technologies, a study has not been published to provide a reference database of normal values for an early adolescent population of children. This reference data can be helpful in diagnosing conditions such as amblyopia and keratoconus at earlier time points. The objective scatter index (OSI) measurement assessed by the HD Analyzer is a good indicator of the quality of optics of an eye.

Twenty five healthy adolescent children (12 male and 13 female) ages 12-14 with no history of ocular pathology or surgery and BCVA of 20/20 OU, were measured on the HD Analyzer wearing their spectacle best corrected manifest refraction to obtain an Objective Scatter Index (OSI). The OSI data was gathered for a total of 50 eyes and analyzed to obtain

averages for this adolescent population.

The average OSI for all eyes included in this adolescent population was OSI= 0.288..

There was no clinically significant difference in OSI scores between female and male populations: OSI= 0.277 females and OSI= 0.3 males.

POSTER 44

Contrast Sensitivity Measurement with a Windows 8 Tablet Display

Jeff Rabin, OD, PhD

Additional Author(s): Timothy Bradshaw

Alicia Chacon

Shawn Johnston

Dennis Yu

It is well established that the ability to detect and recognize low contrast targets often decreases earlier and more rapidly than high contrast vision (e.g., visual acuity) in various ocular conditions and diseases as well as in systemic and neurological disease. Hence it is incumbent upon the eye care professional to utilize low contrast testing. Contrast sensitivity (CS) measures the lowest detectable contrast for patterns of various sizes. While CS is classically measured with sine wave gratings, various CS letter charts exist. The most well-known and widely used letter chart is the Pelli-Robson (PR) which uses large letters which decrease in contrast as one reads down the chart. PR scores have been linked to facial recognition and remain very useful for quantifying CS. However, the PR is a large wall-mounted chart which requires specific overhead illumination. With increasing longevity and emphases on home and remote medical monitoring, portable measures of CS are needed. We describe measurement of CS using a Windows 8 tablet display which yields

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results comparable to the PR test.

CS was measured in 27 visually normal subjects on a Windows 8 tablet using a program available from Innova Systems, Inc. Single letters appeared in the center of the display and the subject used an adjacent touch-screen matching display to identify the letter seen. Contrast was varied up and down in staircase fashion (like a hearing test) to rapidly measure CS. Results were compared to PR test scores.

There was no significant difference between test (PR vs. tablet, $F=3.2$, $p=0.08$) and subject eye (right vs. left, $F=0.02$, $p>0.8$). Mean differences between tests were less than one letter read correctly.

POSTER 45

Psychophysical Measurement of Macular Pigment Optical Density: Effects of Iris Color in Young Healthy Adults

Patricia Cisarik, OD, PhD

Additional Author(s): Jeung Kim, OD, PhD

Heterochromic flicker photometry (HFP) can be used clinically to measure macular pigment optical density in patients. To date no significant relationship has been demonstrated between iris color and the density of macular pigment; however, subjects for previous studies often were middle-aged or older, or the age range in the study was large. This study assessed the relationship between iris color and MPOD measurements in young healthy adults of similar age using the QuantifEye MPOD instrument.

The data from both eyes of 109 healthy young adults between the ages of 21 and 26 who used the QuantifEye instrument to measure their MPOD for a class assignment were examined for the study. Exclusion criteria

included ocular disease and medications known potentially to affect retinal function. One measurement was taken for each eye on 2 visits at least 2 weeks apart. Subjects self-reported iris color.

The mean age of the subjects (23 ± 1.1 years) did not differ between groups. Two-tailed Student's t-test for uncorrelated samples showed a statistically significant difference in mean MPOD score between blue-eyed (0.40 ± 0.16) and brown-eyed (0.45 ± 0.16) subjects ($p = 0.008$) and between hazel-eyed (0.39 ± 0.19) and brown eyed subjects ($p = 0.008$), but not between blue-eyed and hazel-eyed subjects. A significant difference was also found between brown eyed subjects and the blue- and green-eyed (0.40 ± 0.17) subjects combined ($p = 0.002$).

POSTER 46

29 years Old and Not Holding! Late Onset of RK Wound Dehiscence

Alexandra Espejo, OD

Additional Author(s): Kimberly Reed, OD

Zoanne Schinas, OD

Radial keratotomy (RK) was developed in 1974 and used for many years until the arrival of the laser refractive procedures. Even though RK is rarely performed these days, late complications of the procedure can still be seen in clinical practice.

A 53 YO Hispanic female presented with pain and blurry vision OS, for three days. History was remarkable for radial keratotomy OU performed in 1985 in Colombia. Biomicroscopy evaluation of the left eye revealed an inferior nasal elevated opaque lesion in between the RK astigmatic cuts which appeared to be dehiscent, with surrounding edema. The RK scars showed pooling of NaFl

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and punctate staining. Initial treatment included Moxeza 0.5% BID OS, Prolensa 0.07% BID OS and Muro 128 ointment for bedtime use OS. Over a period of two months the lesion and edema resolved, resulting in a scar.

Complications of RK may occur a few or many years after the surgery. They can also range in severity, from changes in refraction, corneal epithelial defects, to more severe as ulcers or rupture of the globe. This case shows an unusual presentation of long term complications of early generation refractive surgery.

POSTER 47

Branch Retinal Vein Occlusion: When Hindsight Really is 20/20 **Lekha Samuel, OD**

Additional Author(s): Sylvia Sparrow, OD

Branch retinal vein occlusion (BRVO) is one of the most common retinal vascular diseases in adults. Diabetes, hypertension, COPD, cardiovascular disease and advanced age are all independent risk factors for the development of BRVO. In a time when these conditions are more prevalent than ever, optometrists play a key role in identifying potential risks, managing sequelae and making timely referrals.

A 63-year-old African American female presented with complaints of intermittent sharp pain OU and secondary complaint consistent with postural hypotension. Medical history was positive for hypertension x 31 years, diabetes x 12 years, hypothyroidism, and asthma. BCVA was 20/20 OD, OS. DFE revealed mild diabetic retinopathy with early crossing changes OU. She was educated to improve blood glucose control, advised to follow up with her PCP and to RTC for annual DFE. One year later she presented with "aching" eyes and

poor vision through spectacles. Her last HbA1c, 8 months prior, was 6.7% and in office BP was 116/78 mmHg. BCVA was 20/20 OD, OS. DFE revealed scattered hemorrhages along the superior temporal arcade OD. The patient was diagnosed with BRVO OD, no diabetic retinopathy OU and was to RTC in one month. Over the course of the next six months the patient was followed monthly. Her HbA1c ranged from 6.7% - 7.7% and blood pressure averaged 140/80 mmHg. Her BCVA varied between 20/20 and 20/80 OD (when macular edema was present) and recovered to 20/25 status post multiple intravitreal Avastin injections with no change OS. Fundus photography and optical coherence tomography were employed at each of the follow up visits.

BRVO is one of the more common ocular complications of hypertension and diabetes. Our patient progressed from mild crossing changes in each eye to a BRVO one year later. This case depicts how vital a clinician's role is to educate and empower patients to take charge of their health. Optometrists have the ability to help prevent vision loss in our patients through patient education and appropriate referrals.

POSTER 48

Optic Nerve Head Drusen: A Myriad of Presentations

Jennifer Jones, O.D. **Additional Author(s): Sylvia Sparrow, OD** **Christina Grosshans, OD**

Optic nerve head drusen (ONHD) are calcified, laminated hyaline deposits that are typically bilateral and occur in approximately 1% of the population. The majority of patients are asymptomatic but ocular sequelae may include visual field defects, vascular occlusion,

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hemorrhage, and choroidal neovascularization. ONHD near the surface are usually easily visualized with ophthalmoscopy, but buried drusen may cause the nerve to have a congested, swollen appearance. ONHD in young children usually present as an elevated optic disc while adults with ONHD commonly have a disc with a “lumpy bumpy border” and bright, irregular deposits. Differentiating ONHD from papilledema is challenging but essential, not only to prevent unnecessary testing but also to avoid misdiagnosing true neurological disorders. B scan, OCT, visual fields, and fundus photography are noninvasive ways to investigate anomalous optic discs.

Patient 1--A 5 year-old white female presented for her first eye examination. Dilated fundus examination revealed bilateral “lumpy” optic discs. Patient 2--An 11 year-old black female presented with a complaint of distance blur. Dilated fundus examination revealed “lumpy” elevated optic discs. Patient 3--A 14 year-old Hispanic male presented with a complaint of headache. Dilated fundus examination revealed an elevated optic disc OS>OD. Patient 4--A 26 year-old Hispanic female presented with a complaint of headache. Dilated fundus examination revealed bilateral congested optic nerves. Patient 5--A 42 year-old white male presented with a complaint of near blur. Dilated fundus examination revealed significant bilateral ONHD and vascular tortuosity.

Through fundus photos, visual fields, B scan, OCT, and MRI, this case analysis will compare the appearance of ONHD in multiple patients with varying demographics, including age, gender, and race. Albeit rare, ONHD may have many ocular complications. Although ONHD may present differently in children and adults, correct identification of this anomaly in all ages is imperative in order to avert needless and costly interventions. B scan and OCT are two important instruments that can be

employed to aid our diagnosis.

POSTER 49

Selected Ophthalmic Non-Steroidal Anti-Inflammatory Drugs (NSAID) Comfort Comparison Based on Brand and Subject's Age

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Additional Author(s): Joanne Smith, OD
William Edmondson, OD
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Topical ophthalmic NSAIDs are indicated for the treatment of pain and inflammation associated with cataract surgery, the reduction of ocular pain/burning/stinging following corneal refractive surgery, and the treatment of ocular allergies.¹ • This study compares the perceived ocular comfort of four non-steroidal anti-inflammatory drugs (NSAID) in order to improve patient compliance. Differences in comfort were evaluated for subjects in two age groups, younger than 40 years and older than 40 years.

A single-blind study compared the comfort of four NSAIDs: diclofenac 0.1%, Bromday (bromfenac 0.09%), Acuvail (ketorolac PF 0.45%), and Prolensa (bromfenac 0.07%). An ocular comfort survey scale from 1-10 was used with 1 representing very comfortable and 10 representing very uncomfortable. The first drop instilled in the subject's right eye, TheraTears, was used as a reference of grade 1. Following TheraTears, the four NSAID drops were instilled in alternating eyes beginning with the left eye in random order, allowing two minutes between drops. Subjects completed the survey following each drop.

For the younger than 40 group, there was no significant difference in comfort between

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Prolensa and Bromday. Diclofenac 0.1% was rated as the least comfortable drop followed by Acuvail. Prolensa and Bromday were rated as the most comfortable drops. • For the older than 40 group, there was no significant difference in comfort between Prolensa and Bromday and between Acuvail and diclofenac 0.1%. Acuvail and diclofenac 0.1% were rated as the least comfortable drops. Prolensa and Bromday were rated as the most comfortable drops. • There was no significant difference when the results from each drop were compared between the two age groups.

University high school FRAT organization will be utilized to assist with survey distribution. Using a convenience sampling approach, researchers are conducting face-to-face surveys with 100 parents of children with ASD in Winter 2015.

Results will be compiled in Spring 2015. Survey outcomes will be analyzed using univariate and multivariate methods. Barriers will be identified using qualitative content analysis.

POSTER 50

Understanding Barriers to Vision Care Among Children with Autism Spectrum Disorder **Vanessa Anaya**

Additional Author(s): Stacey Coulter, OD
Annette Bade, OD

Overall it is estimated that close to 25% of all children (both ASD and typically developing) have vision related issues and more than 11% of children have undetected or untreated eye related vision disorders. One in thirty children are diagnosed with autism spectrum disorder (ASD). Children with ASD typically have differences in visual perceptual and information processing, due to reduced ability to process and integrate sensory information. However, there are unique barriers that children with ASD and their parents may face in accessing vision care. The purpose of this study is to improve our understanding regarding the barriers parents, guardians and caretakers of children with ASD encounter when accessing vision care services.

Survey design and administration follow the principals of community-based participatory research. Students from Nova Southeastern